

First Afternoon Session

Wednesday, October 21st

- Basics of Air Pollution
 - Basics - Gordon Miller - MM&A LLC
 - Added in Modeling Stuff
- Emissions Calculations
 - Lynn Barnes - SCDHEC
 - Tammy Manning - NCDENR
- Title V Certification
 - Betty Gatano - NCDENR
 - Sarah Goode - SCDHEC
- Wrap-Up Roundtable



40th Anniversary Meeting

One of My Products Is Air Pollution!

Now What?

Basics of Air Compliance &
Modeling



Why Is This Important

- Donora, PA; October 1948
 - Began on October 27th
 - Ended on October 30th
 - Temperature inversion in Mon Valley
 - SO₂, sulfuric acid, nitrogen dioxide, fluoride & zinc
 - Killed vegetation for $\frac{1}{2}$ mile all directions
 - Estimated 20 people died prematurely from the event; as many as 7000 affected



What Came Next!

- Local Regulation
 - Before the Donora Incident, Allegheny County (Pittsburgh) formed a group to study “smoke” issues
 - After the Donora Incident, a formal “Smoke Control Ordinance” was passed.
 - Regulated “smoke”
 - Sampling was very rudimentary (vacuum cleaner motors, etc.)
 - Analysis was all “wet chemistry”
 - Note on history, Donora is in Washington County, PA



Why Is This Important(?) (II)



- London Fog (UK), 1952
 - Began on December 5th
 - Ended on December 9th
 - A temperature inversion occurred
 - Cold weather had more people burning coal including the three largest power plants
 - Visibility reduced dramatically
 - As many as 4000 premature deaths occurred.

Other views of the 1952 London "Fog"



What Came Next! (II)



- Los Angeles
 - Invented "Smog"
 - Ozone formation
 - Wind conditions
 - Huge amounts of VOC's with some oxides of nitrogen
 - Largely from mobile sources

This picture is from October 2003!

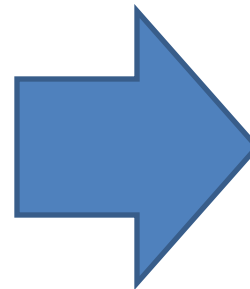
Response by Communities

- Local "Smoke Ordinance"
 - Often part of a response to an incident
 - Tailored to recent incident
 - Very local in focus
- Some state and federal activity
 - 1930's and beyond New York had a "program"
 - Federal government had an office in Cincinnati looking at "air pollution."

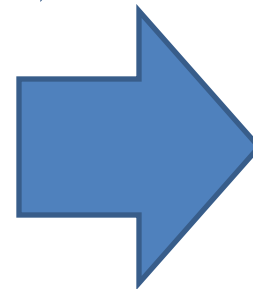
Federal Government

- Clean Air Act of 1970
 - Helped with creating EPA
 - Focused on several pollutants

- Particulates
- Carbon Monoxide
- Nitrogen Dioxide
- Sulfur Dioxide
- Ozone
- Hydrocarbons (rescinded)



Products of
Combustion



Smog

Direction Taken

- Two basic directions
 - Permit the source
 - Began the scheme we see today
 - Largely in place
 - New standards continue to shape and focus
 - 1990 Amendments created the Title V
 - PSD has been around since near the beginning
 - Now NAAQS and MACT standards - about 200 specific chemicals
 - “Certification”
 - Initially aimed at mobile sources
 - PCV valve in 1968
 - Catalytic converter in 1974
 - Many more today - TIER II Diesel (as an example)

Direction Taken (II)

- Third Dimension

- Attainment Status

- Where community stands on meeting NAAQS
 - Impacts directly “conformity” - road roads
 - Impacts growth
 - May drop permitting threshold
 - May involve offsets

**FORCES COMMUNITY TO DISCUSS
HEALTH AND GROWTH ISSUES**

Direction Taken (III)

- Toxic Air Pollutants
 - North Carolina
 - Created a listing of about 90 chemicals
 - Based on acute and chronic health risk
 - Set thresholds and “off property” AAL's
 - South Carolina
 - Created a listing of about 200 chemicals
 - Based on acute and chronic health risk
 - Set thresholds and “off property” MAC's
- Hazardous Air Pollutants
 - About 188 chemicals including some “groups”
 - This is technology (control) based

Now What???



Your boss asking why you need permitting!!!

Focusing on Permitting

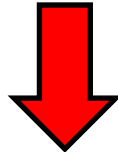
- Initiating Compliance (w/focus on stationary sources)
 - Knowing emissions
 - 200+ chemicals + TAPs (lists are different)
 - Business activity (PSD is different for different businesses)
 - Potential to emit is key (8760 hrs/yr, max production rate)
 - Knowing processes
 - New
 - Update/Modified



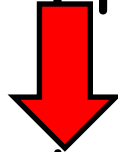
Other
Speakers to
Discuss

Then ...

Matching facility activities to:
Regulations



Permit Application



Permit Received (What Kind, Minor, V, PSD)



Opportunity to Operate Business

Then ...

- Sound out your control strategies -
 - Today
 - Tomorrow
 - “Five Years” from now
- Include -
 - Operational flexibility
 - Costs (today and tomorrow)
 - Upkeep



When You Settle on Control Strategy, Then ---



- Testing May Become Necessary -- Consider
 - How will you conduct the “stack test?”
 - Know process (emissions, limitations, etc.)
 - Know testing methods (all of them!)
 - Know stack testing consultant (preplan, site visits, when you are ready, then ...)
 - PLAN, PLAN, PLAN and then Plan Some More!
 - Send in Protocol - be sure it is very correct (road map)

When You Settle on Control Strategy, Then --- (II)

- Day of testing, do not be afraid to say "We have problems!"
- Understand you can fail!!! Not a good outcome but it does happen!!!
- Review report
- Send results to agency in a timely manner



And ...

- Long-term strategy
 - What is “really” your organization’s long-term strategy?
 - Getting the permit quickly is not a long-term strategy!!!
 - Possibly a tactic victory but long-term nightmare?
 - How will this permitting effort keep you within that strategy?
 - When will “problems” occur when regulations change?
 - When will “problems” occur when your organization’s operations change?

Reminders

- Read the permit
 - Object early if problems arise
- Understand what you just read
 - Recording and recordkeeping
 - Reporting (monthly, quarterly, semi-annual, and annual)
- Prepare for reporting and inspections!!!
- Internal evaluations important!!!



Other
Speakers to
Discuss

Reminders (II)

- Regulations change (often interpretations)
- Your processes are more dynamic than you might think
- Making #'s match program to program (SARA)
- Exemption may disappear
- Thresholds and standards always drift "downward" to tighter control
- Factors change; check spreadsheets
- "lbs/hr" versus "tons/yr"
- Anticipate timing
- Report deviations/keep SSMP logs up-to-date

Where Are We Now?

Cool?

Never!!!

We must be able to
predict impacts on the Community

Local (not just one county)

State (think SIP's)

Regional

National

International (GHG's)

How Can We Predict Impacts?

Modeling



Comes in Different Flavors

Local (not just one county)

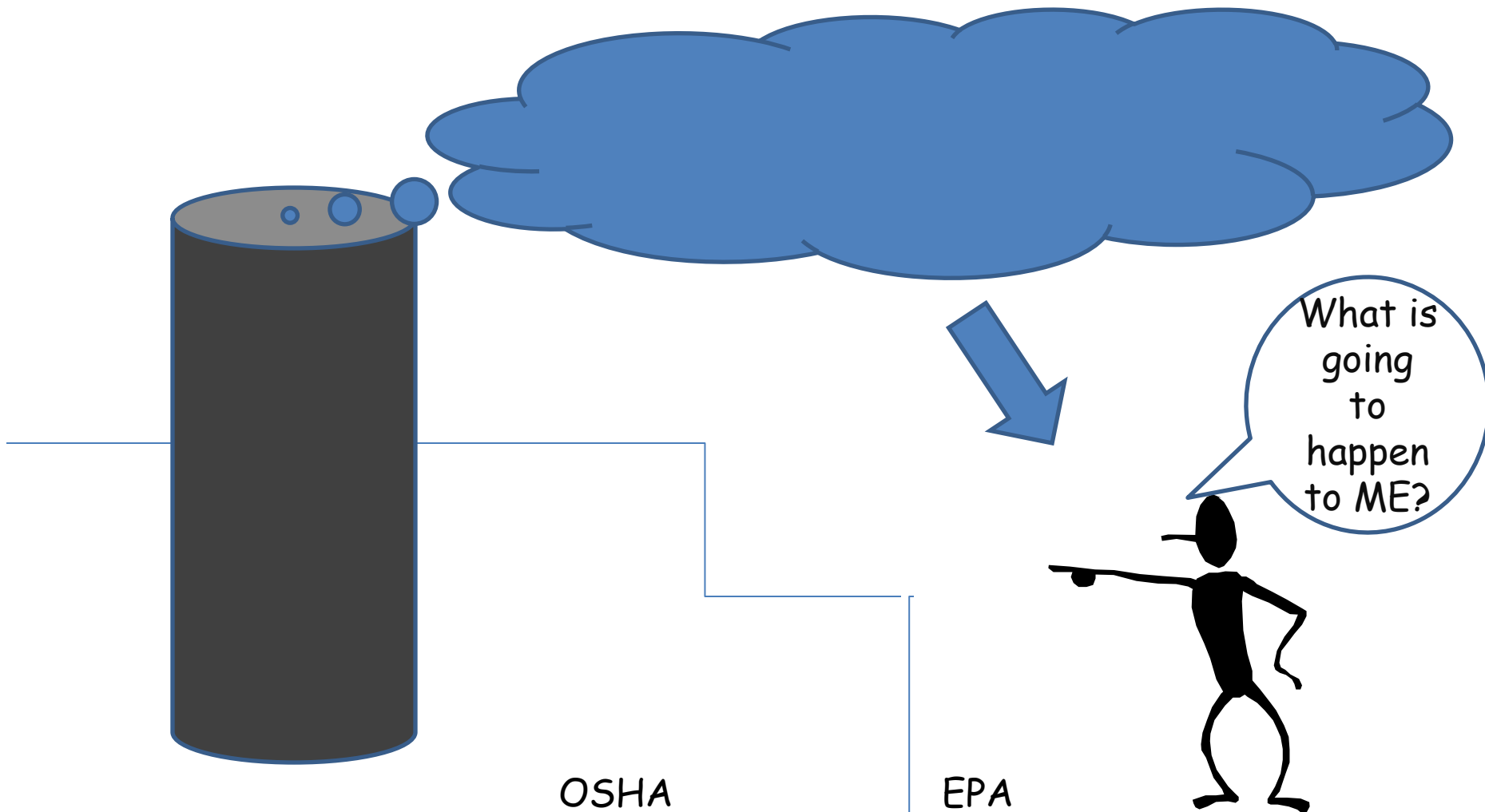
State (think SIP's)

Regional

National

International (GHG's, PM_{2.5})

Concept Basically Consistent



So What Must We Do?

- Create a computer concept that will predict what happens.
 - Source and discharge parameters
 - Weather conditions



- Create estimate of exposure
(Standards [NAAQS, AAL'S, MAC'S] are the estimate of what exposure is OK)



Sources Are Different

- Point Source
 - Classic stack or discharge point
- Area Source
 - Just too many to count
 - Parking lot concept
- Volume Source
 - Volume of air moving along
 - Forest fire smoke(?)



Our focus
for this
presentation!

Which Model to Use

- Simplest is the best for what you need.

SCREEN3 -- very, very basic (we can do it!), worst weather, good for single stack and short distances, can manage some up and down topography

CALPUFF - more complex emissions, over longer distances

AEROMOD (updated ISTST) -- uses actual weather data and geological mapping, multi-stack scenarios, up and down topography

Models

- EPA Website
www.EPA.gov/ttn/scram
- Purchase them:
 - Several fine vendors at this meeting will sell you packages of models

**EPA models are pretty bare,
purchased models have
nicer “front-” and “back-end’s!”**

EPA Website - SCREEN3

RTDM3.2

Rough Terrain Diffusion Model (RTDM3.2) is a sequential Gaussian plume model designed to estimate ground-level concentrations in rough (or flat) terrain in the vicinity of one or more co-located point sources.

Model Code

[Executable](#) (106KB,ZIP)

Model Documentation

User's Guide is currently not available

Latest [Model Change Bulletin](#)

SCREEN3

SCREEN3 is a single source Gaussian plume model which provides maximum ground-level concentrations for point, area, flare, and volume sources, as well as concentrations in the cavity zone, and concentrations due to inversion break-up and shoreline fumigation. SCREEN3 is a screening version of the [ISC3](#) model.

Model Code

[Readme/Code/Executable](#) (176KB,ZIP)

Model Documentation

[User's Guide](#)

Latest [Model Change Bulletin](#)



Note - Single Source!

TSCREEN

Toxics Screening Model (TSCREEN) is a Gaussian model that implements the procedures to correctly analyze toxic emissions and their subsequent dispersion from one of many different types of possible releases for superfund sites. It contains 3 models: [SCREEN3](#), PUFF, and RVD (Relief Valve Discharge).

Model Code

[Code/Executable/Test Case](#) (1.6MB,ZIP)

CALPUFF

CALPUFF Modeling System

CALPUFF is a multi-layer, multi-species non-steady-state puff dispersion model that simulates the effects of time- and space-varying meteorological conditions on pollution transport, transformation and removal. CALPUFF can be applied on scales of tens to hundreds of kilometers. It includes algorithms for subgrid scale effects (such as terrain impingement), as well as, longer range effects (such as pollutant removal due to wet scavenging and dry deposition, chemical transformation, and visibility effects of particulate matter concentrations).

--Please read the following before accessing the CALPUFF modeling system--

The files associated with this system, e.g., executables/source code, preprocessors, associated utilities, test cases, selected meteorological data sets and documentation can be found on TRC's website. Support documents related to CALPUFF can be found on this website and are listed below. TRC will provide updates and changes as necessary for the CALPUFF modeling system on their website. Users entering the TRC website will have the opportunity to register their e-mail addresses in order to receive notices of any updates to the system. This registration is voluntary and not necessary to access the system files.

Upon entering the TRC website, you will see the CALPUFF Model listing on the left-hand panel. To access the system code, click on "DOWNLOAD", then click on Skip Registration if you do not want to register. Go to [TRC](#) EXIT Disclaimer

CALPUFF Regulatory Updates and Consequence Analysis

The current regulatory version of the CALPUFF Modeling System includes:

- CALPUFF version 5.8, level 070623
- CALMET version 5.8, level 070623
- CALPOST version 5.6394, level 070622

For every update of the "EPA-approved" version of the CALPUFF Modeling System, a consequence analysis is performed by EPA using an update protocol that identifies what model changes have been made and their implications based on the analysis results. This analysis

AERMOD

AERMOD Modeling System

The American Meteorological Society/Environmental Protection Agency Regulatory Model Improvement Committee (AERMIC) was formed to introduce state-of-the-art modeling concepts into the EPA's air quality models. Through AERMIC, a modeling system, AERMOD, was introduced that incorporated air dispersion based on planetary boundary layer turbulence structure and scaling concepts, including treatment of both surface and elevated sources, and both simple and complex terrain.

There are two input data processors that are regulatory components of the AERMOD modeling system: [AERMET](#), a meteorological data preprocessor that incorporates air dispersion based on planetary boundary layer turbulence structure and scaling concepts, and [AERMAP](#), a terrain data preprocessor that incorporates complex terrain using USGS Digital Elevation Data. Other non-regulatory components of this system include: [AERSCREEN](#), a screening version of AERMOD; [AERSURFACE](#), a surface characteristics preprocessor, and [BPIPPRIME](#), a multi-building dimensions program incorporating the GEP technical procedures for PRIME applications.

Below is the model code and documentation for AERMOD Version 07026. The model code and supporting documents are not static but evolve to accommodate the best available science. Please check this website often for updates to model code and associated documents. As of December 9, 2006, AERMOD is fully promulgated as a replacement to ISC3, in accordance with [Appendix W](#).

AERMOD Implementation Guide

[AERMOD Implementation Guide \(PDF\)](#) - Provides information on the recommended use of AERMOD for particular applications and is an evolving document. (Updated March 19, 2009.)

Model Code

[Executable \(zip\)](#)

[Source Code \(zip\)](#)

[Test Cases \(zip\)](#)

Model Documentation

[README \(txt\)](#)

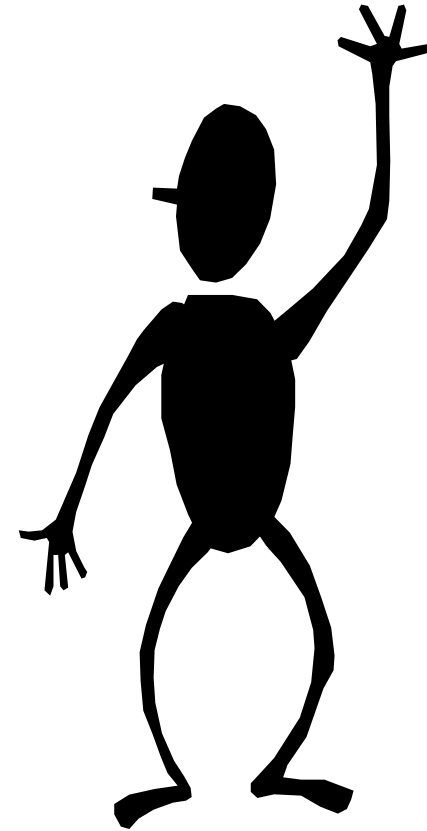
That Means Protocol

- Each state requires use of a protocol
 - North Carolina
 - Write a protocol, submit, and then use it
 - South Carolina
 - Have protocol to follow

Note -- When doing PSD, be sure to have background data, then add your findings. Talk to "Agency Folks" about what applies in your area.

Best Approach

- Do some quick Screen3's
- Figure out generally where you are:
 - "In the weeds" $\rightarrow < 10\%$ of AAL/MAC, well below NAAQS*
 - Getting close $\rightarrow 10\% < X < 100\%$
 - Oops $\rightarrow > 100\%$



* REMEMBER TO ADD IN BACKGROUND!!!

Let's Do a Quick SCREEN3

- CAPCA Manufacturing

- One Stack -

- 50' tall
 - 8' in diameter = 50.24 ft²
 - Flow is 40,000 ft³/min

- Material of interest - Methyl Ethyl Ketone

- On both NC & SC listing
 - Discharge rate is 50 pounds/hr
 - Exhaust = 350°F

- Property

- Flat - Nothing above stack for three miles around
 - Property Boundary is 500' from base of stack
 - Assume rural area



Let's Do a Quick SCREEN3

- *CAPCA* Manufacturing
 - Building Details
 - 250' wide
 - 500' long
 - Tallest Portion = 35'



Unit Conversion



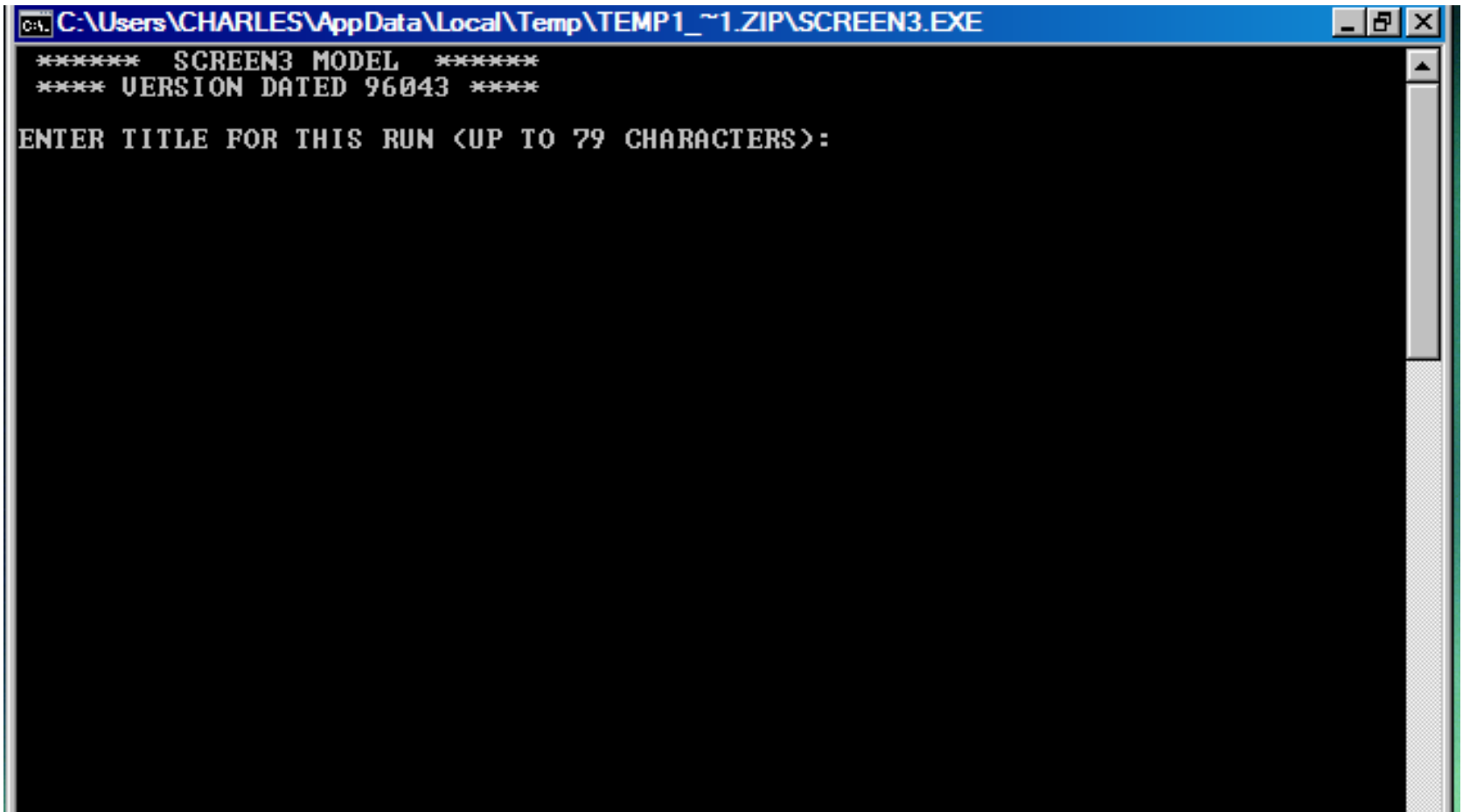
- One Stack -
 - 50' tall = 15.24 m
 - 8' in diameter = 2.44 m²
 - Flow is 40,000 ft³/min => 13.27 ft/sec = 4.04 m/sec
 - Material of interest - Methyl Ethyl Ketone
 - One both NC & SC listing
 - Discharge rate is 50 pounds/hr => 6.31 grams/sec
 - Exhaust = 350°F = 176.7°C + 273.15 = 449.82°K
 - Property
 - Flat - Nothing above stack for three miles around
 - Property Boundary is 500' from base of stack => 152.4'
 - In rural area.

Let's Do a Quick SCREEN3

- *CAPCA* Manufacturing
 - Building Details
 - 250' wide = 76.2 m
 - 500' long = 152.4 m
 - Tallest Portion = 35' = 10.67 m



Opening Up SCREEN3



```
C:\Users\CHARLES\AppData\Local\Temp\TEMP1_~1.ZIP\SCREEN3.EXE
***** SCREEN3 MODEL *****
***** VERSION DATED 96043 *****
ENTER TITLE FOR THIS RUN <UP TO 79 CHARACTERS>:
```

Start Filling In Data

```
C:\Users\CHARLES\AppData\Local\Temp\TEMP1_~1.ZIP\SCREEN3.EXE
***** SCREEN3 MODEL *****
**** VERSION DATED 96043 ****

ENTER TITLE FOR THIS RUN (UP TO 79 CHARACTERS):
CAPCA Manufacturing -- Single MEK Stack

ENTER SOURCE TYPE: P      FOR POINT
                   F      FOR FLARE
                   A      FOR AREA
                   U      FOR UOLUME

    ALSO ENTER ANY OF THE FOLLOWING OPTIONS ON THE SAME LINE:

    N      - TO USE THE NON-REGULATORY BUT CONSERVATIVE BRODE 2
             MIXING HEIGHT OPTION.
    nn.n   - TO USE AN ANEMOMETER HEIGHT OTHER THAN THE REGULATORY
             <DEFAULT> 10 METER HEIGHT.
    SS     - TO USE A NON-REGULATORY CAVITY CALCULATION ALTERNATIVE
    Example - PM 7.0 SS <entry for a point source>

ENTER SOURCE TYPE AND ANY OF THE ABOVE OPTIONS:
P
ENTER EMISSION RATE (G/S):
6.31
ENTER STACK HEIGHT (M):
15.24
ENTER STACK INSIDE DIAMETER (M):
2.44
ENTER STACK GAS EXIT VELOCITY OR FLOW RATE:
OPTION 1 : EXIT VELOCITY (M/S):
          DEFAULT - ENTER NUMBER ONLY
OPTION 2 : UOLUME FLOW RATE (M**3/S):
          EXAMPLE "UM=20.00"
OPTION 3 : UOLUME FLOW RATE (ACFM):
          EXAMPLE "UF=1000.00"
4.04
ENTER STACK GAS EXIT TEMPERATURE (K):
449.82
ENTER AMBIENT AIR TEMPERATURE (USE 293 FOR DEFAULT) (K):
293
ENTER RECEPTOR HEIGHT ABOVE GROUND (FOR FLAGPOLE RECEPTOR) (M):
0
ENTER URBAN/RURAL OPTION (U=URBAN, R=RURAL):
R
CONSIDER BUILDING DOWNWASH IN CALCS? ENTER Y OR N:
Y
ENTER BUILDING HEIGHT (M):
10.67
ENTER MINIMUM HORIZ BLDG DIMENSION (M):
76.2
ENTER MAXIMUM HORIZ BLDG DIMENSION (M):
152.4
USE COMPLEX TERRAIN SCREEN FOR TERRAIN ABOVE STACK HEIGHT?
ENTER Y OR N:
N_
```

Start Filling In Data

```
C:\Users\CHARLES\AppData\Local\Temp\TEMP1_~1.ZIP\SCREEN3.EXE
      U      FOR VOLUME
ALSO ENTER ANY OF THE FOLLOWING OPTIONS ON THE SAME LINE:
  N      - TO USE THE NON-REGULATORY BUT CONSERVATIVE BRODE 2
          MIXING HEIGHT OPTION.
  nn.n   - TO USE AN ANEMOMETER HEIGHT OTHER THAN THE REGULATORY
          <DEFAULT> 10 METER HEIGHT.
  SS     - TO USE A NON-REGULATORY CAVITY CALCULATION ALTERNATIVE
Example - PN 7.0 SS <entry for a point source>

ENTER SOURCE TYPE AND ANY OF THE ABOVE OPTIONS:
P
ENTER EMISSION RATE <G/S>:
6.31
ENTER STACK HEIGHT <M>:
15.24
ENTER STACK INSIDE DIAMETER <M>:
2.44
ENTER STACK GAS EXIT VELOCITY OR FLOW RATE:
OPTION 1 : EXIT VELOCITY <M/S>:
  DEFAULT - ENTER NUMBER ONLY
OPTION 2 : VOLUME FLOW RATE <M**3/S>:
  EXAMPLE "UM=20.00"
OPTION 3 : VOLUME FLOW RATE <ACFM>:
  EXAMPLE "UF=1000.00"
4.04
ENTER STACK GAS EXIT TEMPERATURE <K>:
449.82
ENTER AMBIENT AIR TEMPERATURE <USE 293 FOR DEFAULT> <K>:
293
ENTER RECEPTOR HEIGHT ABOVE GROUND <FOR FLAGPOLE RECEPTOR> <M>:
0
ENTER URBAN/RURAL OPTION <U=URBAN, R=RURAL>:
R
CONSIDER BUILDING DOWNWASH IN CALCS? ENTER Y OR N:
Y
ENTER BUILDING HEIGHT <M>:
10.67
ENTER MINIMUM HORIZ BLDG DIMENSION <M>:
76.2
ENTER MAXIMUM HORIZ BLDG DIMENSION <M>:
152.4
USE COMPLEX TERRAIN SCREEN FOR TERRAIN ABOVE STACK HEIGHT?
ENTER Y OR N:
N
USE SIMPLE TERRAIN SCREEN WITH TERRAIN ABOVE STACK BASE?
ENTER Y OR N:
N
ENTER CHOICE OF METEOROLOGY;
1 - FULL METEOROLOGY <ALL STABILITIES & WIND SPEEDS>
2 - INPUT SINGLE STABILITY CLASS
3 - INPUT SINGLE STABILITY CLASS AND WIND SPEED
1
USE AUTOMATED DISTANCE ARRAY? ENTER Y OR N:
Y
ENTER MIN AND MAX DISTANCES TO USE <M>:
152.4, 5000
```

Then Press Enter and ...

```
C:\Users\CHARLES\AppData\Local\Temp\TEMP1_~1.ZIP\SCREEN3.EXE
*****
*** SCREEN AUTOMATED DISTANCES ***
*****
*** TERRAIN HEIGHT OF 0. M P ***** DISTANCES ***
DIST (M)  CONC (UG/M**3)  STAB  MA  DWASH
-----
152.  382.2  4  18.73  $$$$
200.  294.1  4  21.64  $$$$
300.  187.1  4  24.29  $$$$
400.  155.4  4  27.03  $$$$
500.  133.5  4  29.71  $$$$
600.  116.8  4  30.49  $$$$
700.  103.6  4  32.89  $$$$
800.  91.51  4  34.60  $$$$
900.  81.90  4  36.55  $$$$
1000. 73.18  4  38.45  $$$$
1100. 68.32  4  40.29  $$$$
1200. 64.68  4  43.85  $$$$
1300. 61.06  4  45.50  $$$$
1400. 57.57  4  21.97  $$$$
1500. 54.25  4  22.54  $$$$
1600. 51.15  4  23.11  $$$$
1700. 48.61  6  23.66  $$$$
1800. 48.02  6  24.20  $$$$
1900. 48.97  6  24.73  $$$$
2000. 49.69  6  25.25  $$$$
2100. 50.21  6  25.77  $$$$
2200. 50.55  6  26.27  $$$$
2300. 50.73  6  26.77  $$$$
2400. 50.79  6  27.26  $$$$
2500. 50.74  6  27.76  $$$$
2600. 50.58  6  28.25  $$$$
2700. 50.44  6  28.75  $$$$
2800. 48.69  6  29.24  $$$$
2900. 48.64  6  29.74  $$$$
3000. 48.37  6  30.24  $$$$
3500. 47.24  6  30.73  $$$$
4000. 46.25  6  31.23  $$$$
4500. 45.05  6  31.73  $$$$
5000. 44.45  6  32.23  $$$$
ITERATING TO FIND MAXIMUM CONCENTRATION
MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 152. M:
152. 382.2  4  10.0  10.7  3200.0  17.90  12.11  11.10  $$
USE DISCRETE DISTANCES? ENTER Y OR N:
-
```

What's the Highest Concentration At or Beyond the Property Boundary?

Does Anything "Touch Down" Well Beyond the Property?

What's OK?

- NC

mercury, vapor (7439-97-6)		0.0006		
methyl chloroform (71-55-6)		12		245
methylene chloride (75-09-2)	2.4×10^{-2}		1.7	
methyl ethyl ketone (78-93-3)		3.7		88.5
methyl isobutyl ketone (108-10-1)		2.56		30
methyl mercaptan (74-93-1)			0.05	
nickel carbonyl (13463-39-3)		0.0006		

Our Data States -

$382.2 \mu\text{g}/\text{M}^3 = 0.3822 \text{ mg}/\text{M}^3$
 (this is the 1 hour result)

How About 24 hour standard \rightarrow
 $0.3822 \text{ mg}/\text{M}^3 \times 0.4 = 0.153 \text{ mg}/\text{M}^3$



24 hour
Standard in
 mg/M^3



1 hour
Standard in
 mg/M^3

What's OK (II)?

- NC

- $0.3822/88.5 = 0.43\% \rightarrow$ in the weeds for 1 hour standard

- $0.3822 \times 0.4/3.7 = 4.1\% \rightarrow$ still in the weeds for 24 hour standard

What's OK?

- SC

4,4-Methylene Bis(2-chloroaniline)	101-14-4	3	1.10
4,4-Methylenediamine	101-77-9	5	4.00
Methyl Ethyl Ketone (2-Butanone)	78-93-3	1	14750.00
Methyl Hydrazine	60-34-4	3	1.75
Methyl Iodide	74-88-4	3	58.00

Our Data States -

$382.2 \mu\text{g}/\text{M}^3 = 382.2 \mu\text{g}/\text{M}^3$
(this is the 1 hour result)



Standard -
Standard
 $\mu\text{g}/\text{M}^3$

What's OK (II)?

- SC

– $382.2/14,750 = 2.6\% \rightarrow$ in the weeds for SC Air Toxics

But Are We Done Yet???

Nope!!!

Remember to ...

```

C:\Users\CHARLES\AppData\Local\Temp\TEMP1_~1.ZIP\SCREEN3.EXE
2700.  50.44      6      3.5      4.4 10000.0    44.60    83.57    26.67    $$
2800.  48.69      6      3.5      4.4 10000.0    44.60    86.36    26.64    $$
2900.  48.64      6      3.5      4.4 10000.0    44.60    89.15    27.10    $$$
3000.  48.37      6      3.5      4.4 10000.0    44.60    91.92    27.52    $$$
3500.  47.24      6      3.5      4.4 10000.0    47.15    105.65   29.40    $$
4000.  46.25      6      2.5      3.2 10000.0    50.43    119.17   31.13    $$
4500.  45.05      6      2.5      3.2 10000.0    50.43    132.50   32.85    $$
5000.  44.45      6      2.5      2.5 10000.0    54.87    145.67   34.35    $$
ITERATING TO FIND MAXIMUM CONCENTRATION - - -
MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 152. M:
152.  382.2      4      10.0    10.7 3200.0    17.90    12.11    11.10    $$
USE DISCRETE DISTANCES? ENTER Y OR N:
N
*** CAVITY CALCULATION - 1 ***          *** CAVITY CALCULATION - 2 ***
CONC <UG/M**3> = 471.3                  CONC <UG/M**3> = 942.5
CRIT WS @10M <M/S> = 10.09              CRIT WS @10M <M/S> = 10.09
CRIT WS @ HS <M/S> = 10.98              CRIT WS @ HS <M/S> = 10.98
DILUTION WS <M/S> = 5.49                 DILUTION WS <M/S> = 5.49
CAVITY HT <M> = 10.67                    CAVITY HT <M> = 4.67
CAVITY LENGTH <M> = 58.35                CAVITY LENGTH <M> = 48.
ALONGWIND DIM <M> = 76.20                 ALONGWIND DIM <M> = 76.20
DO YOU WISH TO MAKE A FUMIGATION CALCULATION? ENTER Y OR N:
Y
*** INVERSION BREAK-UP FUMIGATION CALC. ***
CONC <UG/M**3> = 80.91
DIST TO MAX <M> = 2930.24
CONSIDER SHORELINE FUMIGATION <=<=3000M FROM SHORE?>
N
*****
*** SUMMARY OF SCREEN MODEL RESULTS ***
*****

```

CALCULATION PROCEDURE	MAX CONC <UG/M**3>	DIST TO MAX <M>	TERRAIN HT <M>
SIMPLE TERRAIN	382.2	152.	0.
BLDG. CAVITY-1	471.3	58.	---
BLDG. CAVITY-2	942.5	48.	---
INU BREAKUP FUMI	80.91	2930.	---

```

*****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
*****
DO YOU WANT TO PRINT A HARDCOPY OF THE RESULTS? ENTER Y OR N:

```

Check Out the Building Cavity and Fumigation Issues - On Property?

And Also ...

- If you are doing any of the NAAQS modeling - CO, NOx, etc.

**YOU MUST ADD IN THE
BACKGROUND SINCE YOU CANNOT
CREATE A VIOLATION BEYOND THE
PROPERTY BOUNDARY!**

Nice Checklist ... NCDENR

North Carolina Modeling Protocol Guidelines

The North Carolina Modeling Protocol Checklist supports the goal of developing the individual entities modeling plan for North Carolina state and county-level modeling. The protocol checklist is designed to provide the same level of information to regional-level modeling protocol as discussed in Chapter 2 of the *Guidance for the User using the Air Quality Impact or Toxic Assessment in North Carolina*. The modeling protocol checklist is submitted with the modeling analysis.

Although most of the information requested in the modeling protocol checklist is self-explanatory, additional comments are provided, where applicable, and are discussed in greater detail in the toxic modeling guidelines referenced above. References to sections, tables, figures, appendices, etc., in the protocol checklist are found in the toxic modeling guidelines.

INSTRUCTIONS: The modeling report supporting the compliance demonstration should include most of the information listed below. As appropriate, answer the following questions or indicate by check mark the information provided or action taken as reflected in your report.

FACILITY INFORMATION

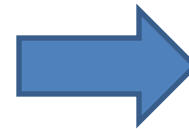
Name:	Consultant (if applicable):
Facility ID:	
Address:	
Contact Name:	Contact Name:
Phone Number:	Phone Number:
Email:	Email:

GENERAL

Description of New Source or Source / Process Modification: provide a short description of the new or modified source(s) and a brief discussion of how this change affects facility production or process operation.	
Source / Pollutant / Parameter: provide a table of the affected pollutants, by source, which identifies the source type (point, area, or volume), maximum pollutant emission rate over the applicable averaging period(s), and, for point sources, indicate if the stack is capped or non-vented (C/N).	
Pollutant Emission Rate Calculations: indicate how the pollutant emission rates were derived (e.g., AP-42, mass balance, etc.) and where applicable, provide the calculations.	
Site / Facility Diagram: provide a diagram or drawing showing the location of all existing and proposed emission sources, buildings or structures, public rights-of-ways, and the facility property (actual) / fence line (criteria pollutants) boundaries. The diagram should also include a scale, true north indicator, and the UTM or latitude/longitude of at least one point.	
Certified Plat or Signed Survey: a certified plat (map) from the County Register of Deeds or a signed survey must be submitted to validate property boundaries modeled.	
Topographic Map: A topographic map covering approximately 5km around the facility must be submitted. The facility boundaries should be annotated on the map as accurately as possible.	
Cavity Impact Analysis: If using SCREEN3, a cavity impact analysis must be conducted for all structures with a region of influence extending to one or more sources modeled to determine if cavity regions extend off property (actual) or beyond the fence line (criteria pollutants). No separate cavity analysis is required if using AERMOD. See Section 4.2.	

Role of Questions!

- Welcomed today during roundtable (towards 3:00 PM)
- Always welcome - Socratic Learning
- That is what CAPCA is all about
 - Find folks at breaks
 - Find folks at lunch/socials
 - Find folks in the Exhibit Hall



**Ask
Questions**

Next Are ...

- Emission Calculations
 - Lynn Barnes - SCDHEC
 - Tammy Manning - NCDENR
- The Title V Certification Process
 - Betty Gatano - NCDENR
 - Sarah Goode - SCDHEC
- Quick Roundtable for Initial Round of Questions

Formal Break - "The Big Cookies"

THANK YOU!!!