

Development of 1999 NEI for HAPs

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What is the NEI?

EPA's National Emission Inventory

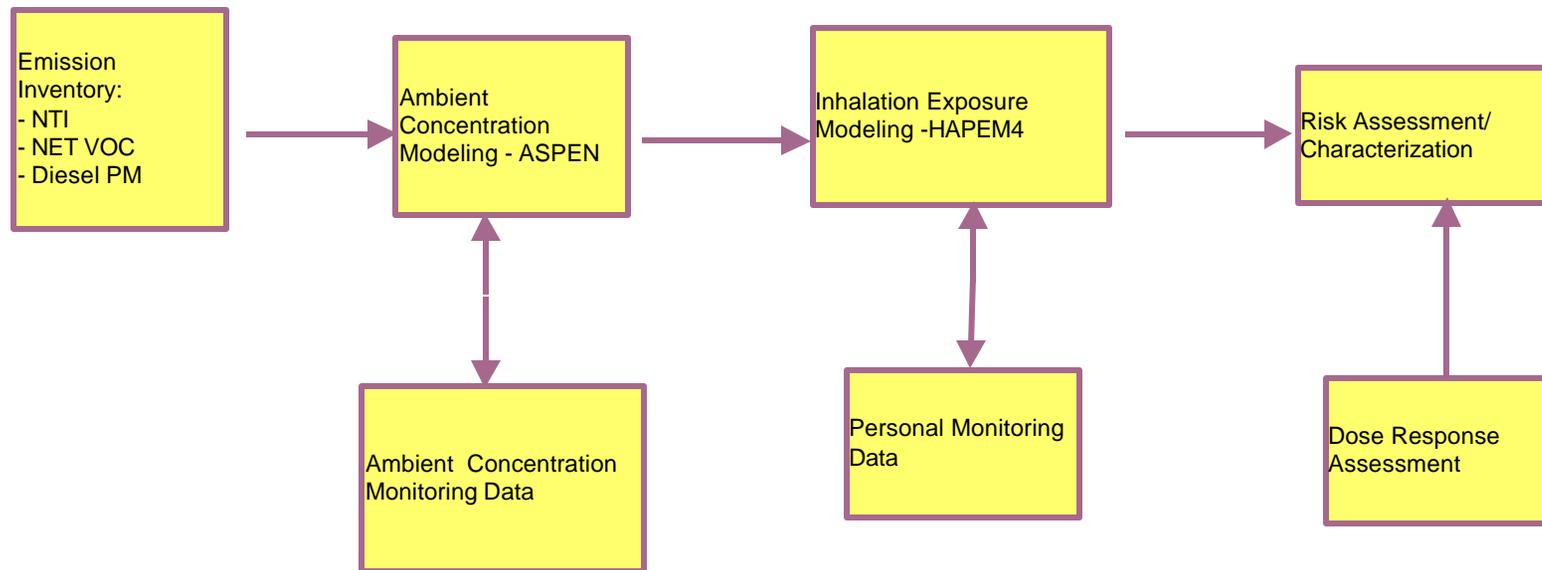
- National Emission Inventory of Criteria Pollutants (and Precursors) and HAPs
- Replaces NTI (HAPs) and NET (criteria air pollutants)
- Published by EPA's Office of Air Quality Standards and Planning

Geographic coverage	50 states, DC, Puerto Rico, Virgin Islands
Source category coverage	major - facility specific (point) area & other- facility specific (point) and county (non-point) mobile on-road & non-road - county
Number of HAPs	188 HAPs (Approximately 500 speciated HAPs)
Base year	1990, 1996, 1999 - Highest quality data 1996 and forward
Resolution of data; (level of detail)	facility/stack - major and some area sources county - mobile, other and some area sources
Temporal Coverage	annual emissions
Data System/Format	ORACLE
Size of Database	10 gigabytes
Modeling files	ftp://ftp.epa.gov/EmisInventory/
Public summary data	epa.gov/air/data/

EPA Needs the NEI for HAPs

- **National, Regional and Local Scale Air Quality & Human Exposure Modeling - NATA**
- **CAA Programs - PBT Strategies, Urban Air Toxics Strategy, 112c6**
- **Regulatory Impact Analysis**
- **Risk Assessment Studies - Residual Risk**
- **Emission Trends - Public Reports**
- **International Reporting**
- **GPRA Reporting**

NATA - National Scale Air Toxics Assessment



Role of Emission Uncertainty in Ambient Model Concentrations

■ Total Mass

- Completeness of emission sources - facilities and source categories
- Speciation of compound classes for grouping

■ Geographic Distribution of Mass

- Facility location data
- Spatial allocation of non-point sources

■ Vertical Distribution of Mass

- Stack parameters

■ Chemical/Physical Characteristics

- Assignment of PM coarse/fine splits
- Assignment of reactivity classes

■ Temporal Resolution

- Allocation of emissions from annual to 3 hr

Reporting of HAP Groups

- **Metals- report individual compounds**

 - Chromium - hexavalent, trivalent, other chromium

 - Lead - organic and inorganic

 - Mercury - particulate, gaseous elemental, gaseous divalent

 - Nickel - nickel subsulfide and other nickel

- **POM - report individual PAH**

 - 7- PAH

 - Other PAHs with cancer assessments

- **Dioxins/Furans - report individual congeners**

 - TEQ and non-TEQ

- **Xylenes, Cresols, Glycol Ethers - report individual compounds**

 - Xylenes - xylenes mixture of o,m, and p isomers

 - Cresols - cresols/cresylic acids mixture

 - Glycol ethers - report as a group, only include glycol ethers, EGBE delisted from section 112 HAPs

HAP Inventory Source Categories

- **Point Sources (facility)**

 - Major Sources (>10/25 tpy)

 - MACT

 - Non-MACT

 - Area Sources (<10/25 tpy)

 - MACT

 - Non-MACT

- **Non-Point Stationary Sources (county)**

 - Area/Other Sources (<10/25 tpy)

 - MACT

 - Non-MACT

- **Mobile Sources (county)**

 - On-road

 - Non-road

Minimum Reporting of Stationary Source Categories

■ Point Sources

Report all Facilities, both major and area, as Point Sources

Report all Major sources both MACT and nonMACT as Point Sources

- Report all MACT Facilities, both major and area, as Point Sources

■ NonPoint Sources

Report Stationary Source Categories Not Included in Point Sources

Eliminate double counting with point sources, e.g., dry cleaners

Stationary Point Sources

Point Sources - Sources are inventoried individually at stack/process level

- **Source Identification**
 - Facility Name and Id
- **Source Location**
 - Latitude, Longitude
 - Address, State/County
- **Source Description**
 - Release Type- Stack or Fugitive
 - Stack Parameters, Capacity
 - Source Type - Major or Area
- **Process Description**
 - Standard Industrial Classification (SIC) Code
 - Source Classification Code (SCC)
 - MACT Code
- **Activity**
 - Operating schedule
 - Throughput
 - Temporal Data
- **Control Device**
 - Equipment Type
 - Efficiency
- **Emissions By Pollutant Species**
 - Amount
 - Methods including emission factor
 - Emission Type - Actual, Allowable, Potential, Maximum

Stationary NonPoint Sources

NonPoint Sources - Typically too small to be inventoried as point sources

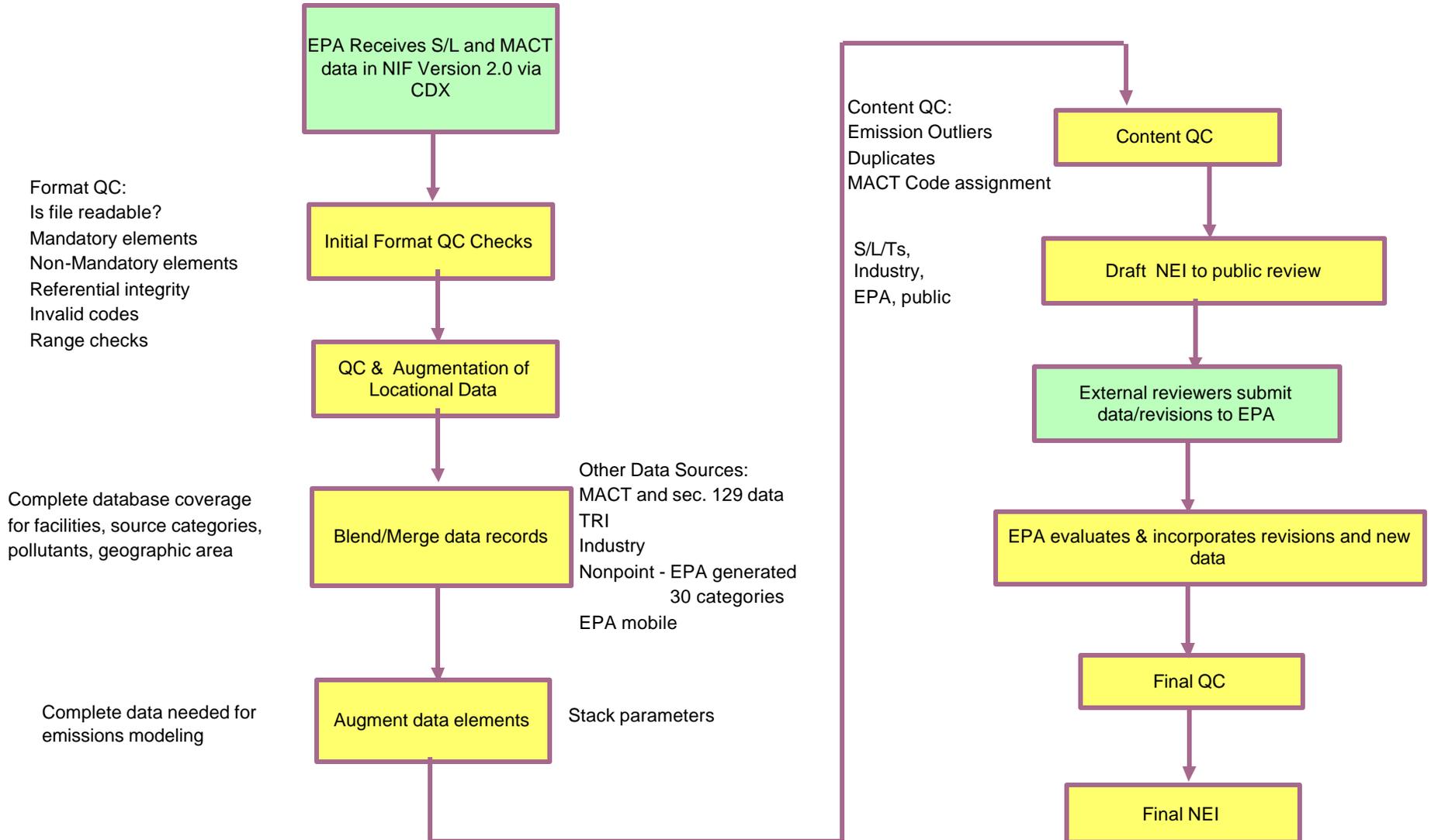
- **Source Identification**
 - **Source Category**
- **Source Location**
 - **County/State**
- **Source Category Description**
 - **Source Type - Major or Area**
 - **Source Classification Code (SCC)**
 - **MACT Code**
- **Activity**
 - **Throughput**
 - **Temporal Data**
- **Control Device**
 - **Equipment Type**
 - **Efficiency**
- **Emissions By Pollutant Species**
 - **Amount**
 - **Methods including emission factor**
 - **Emission Type - Actual, Allowable, Potential, Maximum**

1999 NEI Development

Goals for the 1999 NTI

- **Stick to schedule**
- **Use standardized format for data inputs and outputs**
 - NIF Version 2.0 to send in data
 - Outputs - NIF Version 2.0, summary data tables
- **Consistently use best data**
 - Hg from Utilities and MWC data - we will only use MACT data
 - Other sources - use State and Local agency and Tribal data if available
- **Improve QA/QC**
 - Reduce number of missing sources
 - Reduce errors in geographic coordinates
 - Reduce number of missing stack parameters
 - Improve consistency in nonpoint sources across nation
- **Reduce number of nonpoint source categories by increasing number of categories inventoried as point sources**
- **Integrate criteria and HAP emissions where feasible**

Compilation of NEI



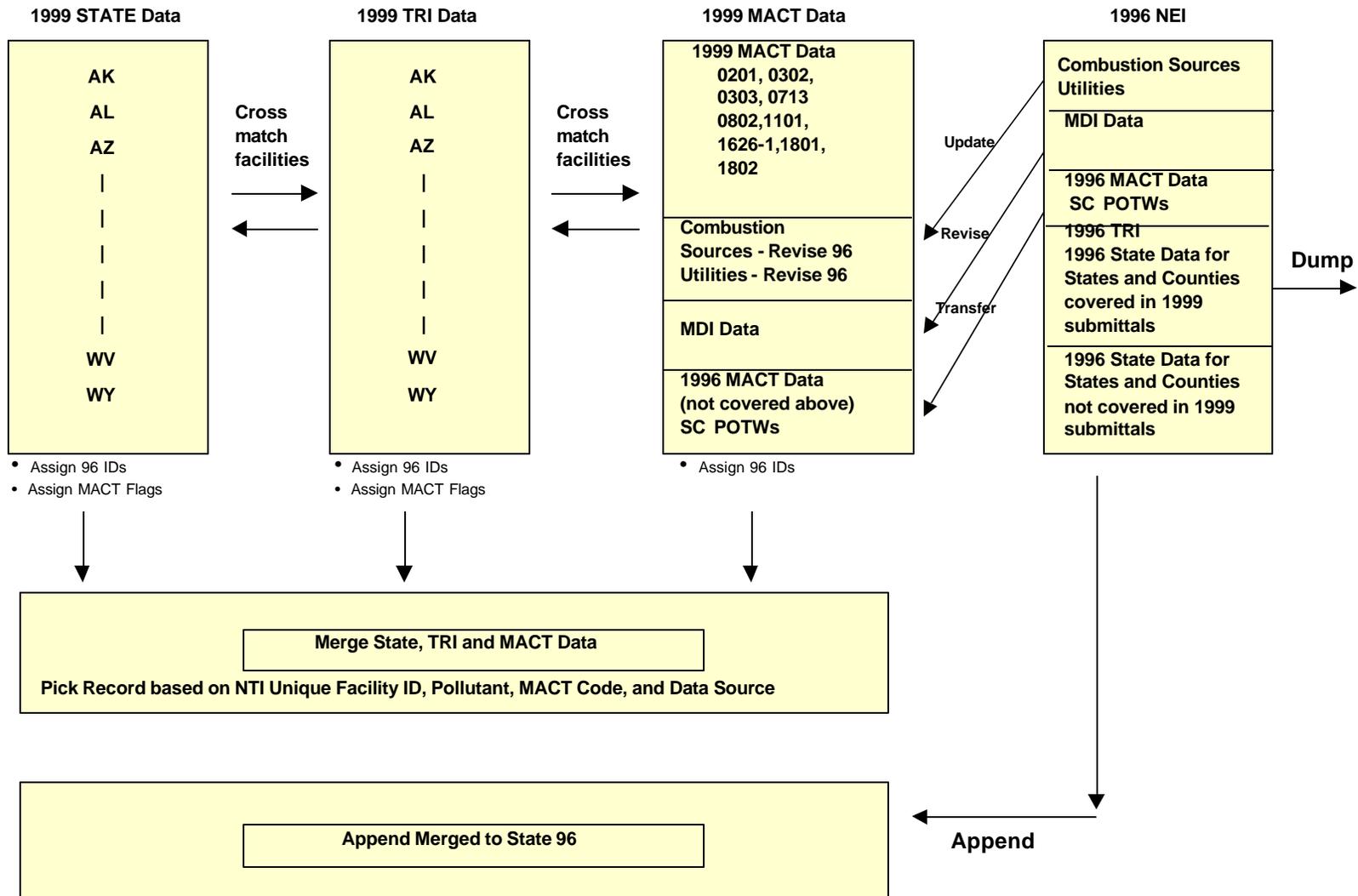
Data Submittal

- **State and local agencies and tribes**
- **Industry data**
- **MACT/Residual Risk Data**
- **TRI Data**
- **EPA's OTAQ data**
- **Estimated nonpoint emissions for <30 categories**
- **1996 NTI point source data if no other data available**

Blending/Merging Steps

- **Correct format errors - invalid codes, referential integrity violations, etc.**
- **Default/Correct latitude/longitude**
- **Assign MACT codes**
 - Emissions data provided by MACT engineer
 - Facility list
 - SIC code or SCC default
- **Compare data from 4 data sources - S/L/T, MACT, TRI, 96NTI**
 - Identify duplicate facilities using state, county, facility name, address, latitude/longitude, common IDs using automated program
 - Unmatched facilities - run second program to further match facilities
- **Select emissions based on hierarchy**
 - Goal: emissions of all HAPs emitted from each process within a facility
 - S/L/T data preferred over MACT data except for MWCs and Hg from utility coal
 - MACT data preferred over TRI data
 - TRI data preferred over 96 NTI
- **Assign Unique Facility IDs**
 - Multiple Site IDs for processes and HAPs supplied by individual data sources
 - Each facility has one Unique Facility ID
 - Example: Unique Facility ID - NTIAL001 with Site IDs AL001 for state data supplied by AL, EM234 for HAPs from boilers not included in State data supplied by MACT engineers

Blending/Merging Process



Data Augmentation

■ Locational Defaults

- **QC Findings: 79% of 185, 540 records in emission release point table have valid lat/lons in correct county**
- **Augmentation Procedure**
 - FRS unavailable
 - **GEOCODER Program used for 14% of records (26, 378 records)**
 - **Exact Matches (47.7% of GEOCODER matches)**
 - **Near - match to single street block (1.8% of GEOCODER matches)**
 - **Zip code +2 (2.4% of GEOCODER matches)**
 - **Zip code5 (47% of GEOCODER matches)**
 - **Zip code3 - match to 3 digit zip code (0.51% of GEOCODER matches)**
 - **Ambig - match to one of possible multiple street segments (0.54% of GEOCODER matches)**
 - **County centroid used for 7% of records (13,014 records)**
 - **691 records do not have lat/lons because they are portable and move from county to county within a state**

Data Augmentation

■ Stack Parameter Defaults

- Stack height, diameter, temperature, velocity, and flow rate

■ QC Findings:

- 23% of records have all 5 parameters
- 11% have only 4 parameters
- 1% have only 3 parameters
- <1% have only 2 parameters
- 3 % have only 1 parameter
- 28% have 0 parameters for stack emissions
- 34% have 0 parameters for fugitive emissions

■ Augmentation Procedures

- Fugitive releases - use lower end of parameter range

- Height - 0.01 ft
- Diameter - 0.01 ft
- Temperature - 50 degrees F
- Velocity - 0.01 ft/sec
- Flow Rate - 0.01 cu ft/sec

■ Stack releases

- Calculate missing flow rate, diameter, or velocity if only one of the 3 parameters is missing
- NEI default look-up tables generated by SCC and SIC Codes - if multiple defaults available, use default record with lowest stack height
- If no SCC or SIC code are available, use national default values
 - Height - 10 ft
 - Diameter - 1 ft
 - Temperature - 72 degrees F
 - Velocity - 15 ft/sec
 - Flow Rate - 12cu ft/sec

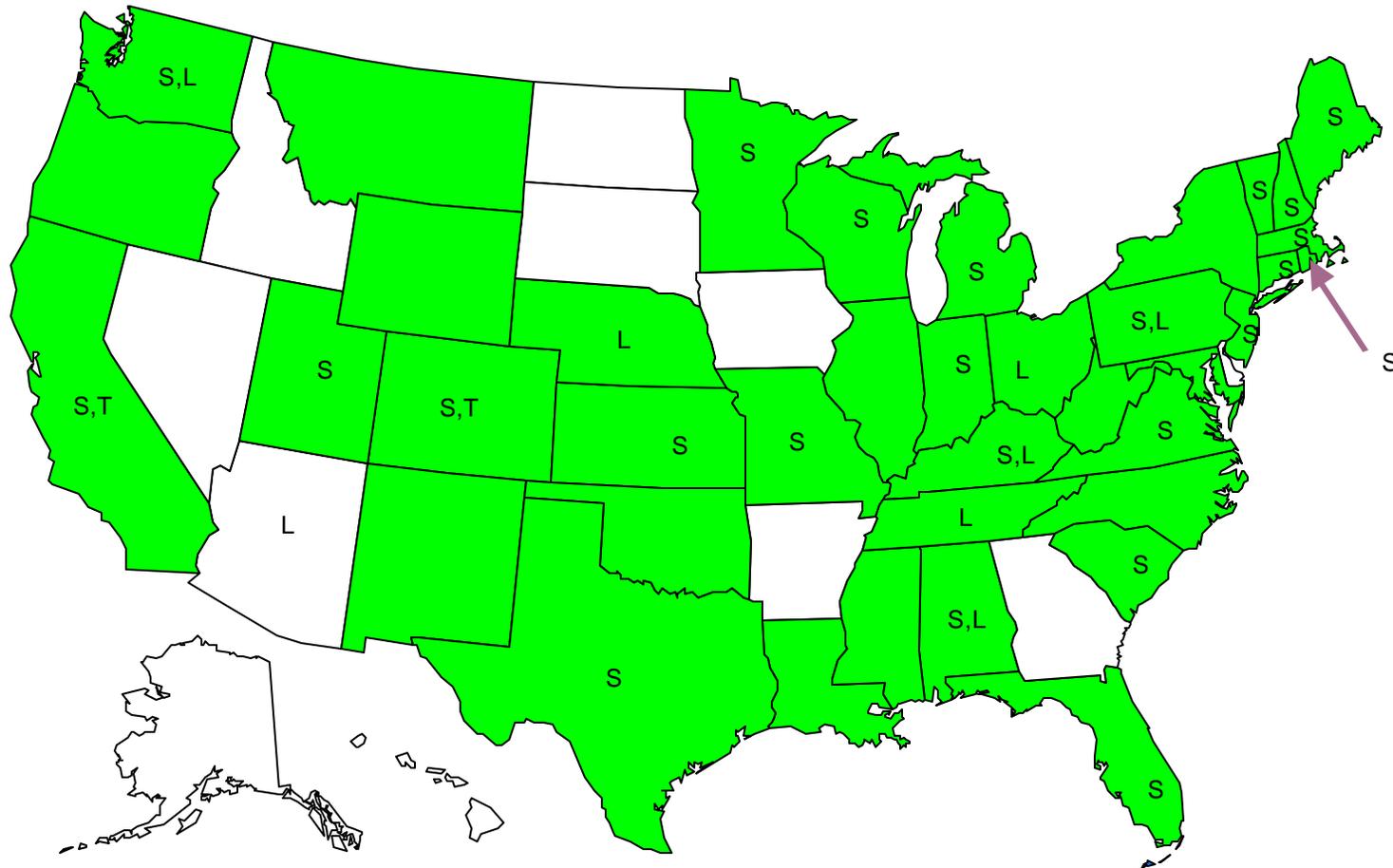
QC/QA

- **Format QC - identify potential errors with format**
 - Checks data integrity
 - Evaluate code values
 - Conduct range checks
- **QC of Locational Data - verify facility locations in county**
 - Convert UTM coordinates to latitudes/longitudes
 - Correct obvious errors in latitudes/longitudes (transcribed coordinates, etc.)
 - Examine coordinates for multiple stacks within a facility
 - Investigate standard deviations of coordinates within a facility >0.02 degrees
 - Use a GIS program to plot latitude/longitude for each release point within reported county
 - Investigate points not within 5 km of an outside boundary of the county assumed to be valid
- **Content QC - identify emission outliers, duplicate facilities, duplicate emissions**
 - Significant changes between 96 and 99 emissions by facility, category, county, and state
 - Significant variation within 99 draft data for facilities within source categories
 - Individual facility checks
 - Identify top emitters for each HAP nationwide
 - Rank each facility based on emissions nationwide
 - List top emitters for each HAP/MACT category combination

External and Internal Review

- <ftp://ftp.epa.gov/EmisInventory/draftneiver2/haps>
- **Subdirectories**
 - **README**
 - Overview of files
 - Organization of files
 - File structure
 - How to review data
 - Instructions on submitting revisions
 - Schedule
 - Software needed to review data
 - **Documentation**
 - Point source
 - NonPoint Source
 - **State data files in NIF Version 2.0**
 - **Data Summary Reports**
 - 96-99 Site List
 - 99 County Emission Summary
 - 99 Facility Summary
 - 99 Facility Data Source Summary

Agencies who submitted 1999 HAP Inventory Data/Revisions to EPA by February 2002



Green - states (agencies) who submitted HAP inventory data
T - tribes who submitted revisions
L - local agencies who submitted revisions
S - state agencies who submitted revisions

Summary of 99 HAP Data Received

Agency Type	# Point Inventories Submitted by June 2001	# NonPoint Inventories Submitted by June 2001	# Stationary Inventories Submitted by June 2001	# Point Inventories Submitted by February 2002	# NonPoint Inventories Submitted by February 2002	# Stationary Inventories Submitted by February 2002
State	37	11	38	23	4	24
Local	10	2	10	9	1	9
Tribe					1	1
Total Agencies	47	13	48	32	6	34
Total States (State/Local/Tribal)	39	13	39	27	5	28

March 1, 2002 - Agencies and tribes located in 40 states have either provided 1999 HAP inventory data or revisions to EPA.

Incorporation of Comments

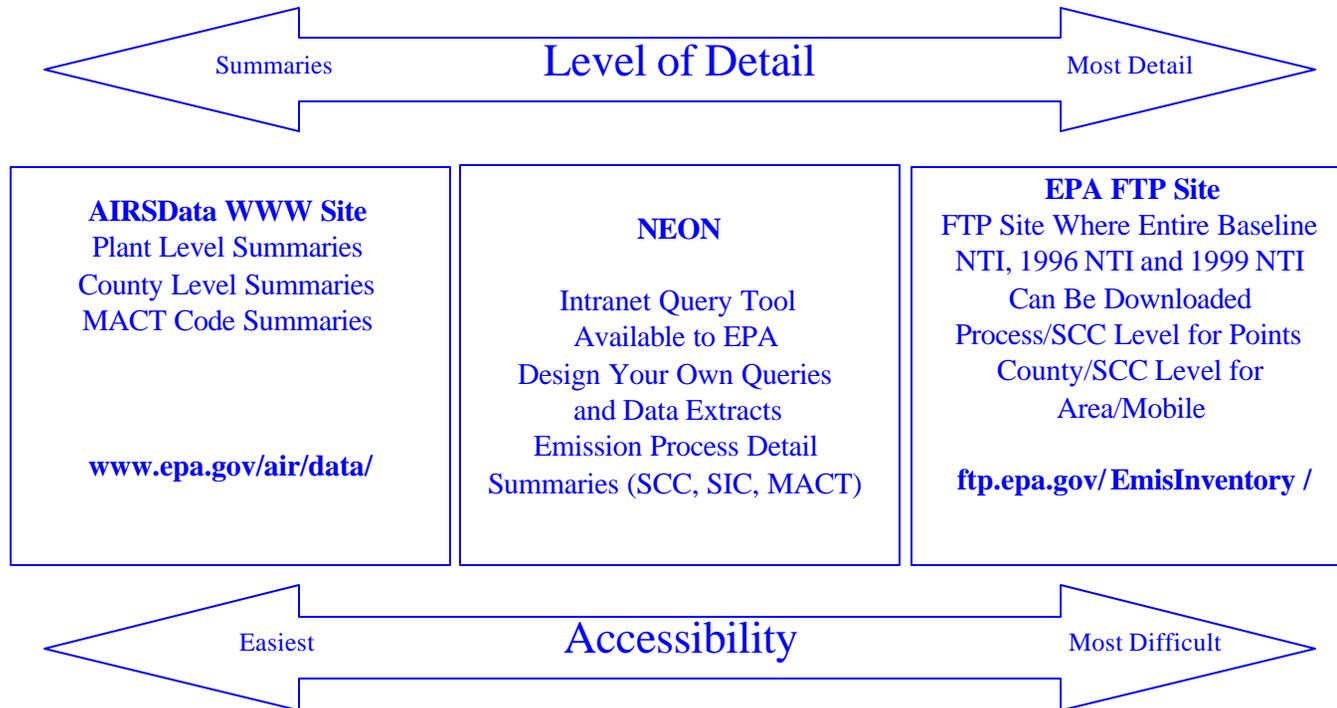
■ 3 Types of Revisions

- to draft emissions records
- Additions of new facilities of emission records for existing facility
- Deletions of draft facilities or draft emission records within a facility

■ Steps

- QC format of revised and new records
- Review documentation provided by commenters
- Verify add/revise/delete codes of the revisions are accurate
- Verify that no source category overlap exists between draft and revised data
- Review revised emission estimates by source category and HAP to determine validity of revisions
 - For most non-emission fields: Process all revisions with valid codes and within valid data ranges
 - Add new facilities and emission records for existing facilities
 - Revise emissions records for existing facilities if original data are provided by reviewer except for TRI data - TRI data will not be changed until amended form is sent to OEI and TRI data are changed in publicly accessible TRI data
 - Evaluate facility deletions and emission record deletions
 - If draft NEI data (except TRI data) are provided by reviewer, process deletion
 - If draft NEI data are not provided by reviewer, further evaluate proposed deletion,
 - If facility not in operation, delete facility
 - If facility is recommended for deletion, but was open in 1999 and no duplicate facility is present, do not process deletion
 - IF TRI or MACT facility is recommended for deletion and was open in 1999 and duplicate facility is present, evaluate HAPs emitted from processes within the duplicated facilities
 - If HAPs for process are duplicated, process deletion
 - If HAPs for process are not duplicated, do not process deletion
 - Merge HAPs for duplicate sites using NTI Unique Facility ID

NTI Data Access



1999 NEI Schedule

Date	Activity	Expected Result
June 1, 2001	State, local and tribal data submitted to EPA	Prescribed data transfer format used
June/July 2001	Initial QC review of submitted data	Confirmation that data file can be read; required minimal data included
October 1, 2001	Draft NEI Version 2.0 published	Draft databases available for external review
February 1, 2002	Comments on draft 1999 NEI Version 2.0 submitted to EPA	Revisions submitted in prescribed format
June 1, 2002	State, local and tribal data submitted to EPA, Version 3.0	Prescribed data transfer format used
October 1, 2002	Draft NEI Version 3.0 published	Draft databases available for external review
February 1, 2003	Comments on draft 1999 NEI Version 3.0 submitted to EPA	Revisions submitted in prescribed format
June 1, 2003	1999 NEI Version 3.0 published	Files available to support CAA and GPRA needs

1999 NEI Resources

- **1999 NEI Data Incorporation Plan**

www.epa.gov/ttn/chief/net/nei_plan.pdf

- **1999 NTI Q's & A's - preferences on how to report pollutant compound groups such as Cr**

www.epa.gov/ttn/chief/nti/ntiq&a.pdf

- **NIF Version 2.0**

www.epa.gov/ttn/chief/eidocs

- **QA/QC NIF Format Tool**

www.epa.gov/ttn/chief/nif/

- **NEI QA and Augmentation Memo**

www.epa.gov/ttn/chief/emch/invent/

- **Draft 1999 NEI**

- ♦ Data Files in NIF Version 2.0 format
- ♦ Summary Data Files
- ♦ Documentation
- ♦ README

<ftp://ftp.epa.gov/EmisInventory/>

- **1996 Data Summary on AIR Data**

www.epa.gov.air/data

- **NEI Users Group and Listserve**

▪ <http://www.epa.gov/ttn/chief/listserv.html#nei>