

Final Screen

What is the overall goal for the technical team?

The goal of the Final Screening process is to develop more accurate estimates of the ambient concentrations for chemicals remaining in the process after completion of the Secondary Screen, using the best information on sources that can be collected to develop new and more accurate estimates of concentrations in community air. With these new estimates, the Final Screen will be used to identify the chemicals and the sources that will be priorities for potential community action. A flow chart showing a summary of the steps for completing the Final Screen is shown in Figure 12-1.

How will the technical team estimate concentrations?

As it did in the Secondary Screen, the technical team will estimate chemical concentrations using the ISCST model. In addition, the MOBILE6.2 model may be used to develop more accurate concentration estimates for on-road sources.

How will the technical team collect the new information needed to estimate concentrations in the Final Screen?

The Partnership will draw on all of its members and organize special teams to contact, visit, or observe the sources that are under review in the Final Screen. This may involve surveying traffic on major roads or contacting and visiting both large and small commercial, industrial, and public facilities.

The Partnership teams that are established to collect the information should contain a cross section of Partnership members. Community leaders and local residents will explain the work of the Partnership and convince facility sources to cooperate and join in the effort. Technical members of the Partnership will be needed to help with the collection and verification of the information. Refer to the Final Screen chapter in the Overview for a description of the resources needed to collect the required information.

What new information will be used to estimate concentrations in the Final Screen?

The following is a list of the types of information the Partnership teams will have to collect for each source under review in the Final Screen.

Stationary Point Sources

Release amounts—Instead of using values obtained from various databases, the Partnership teams will collect and verify estimates or measurements of actual released amounts (e.g., tons/year). For those sources where a top-down or bottom-up approach was used to develop a stationary point source emission rate, the Partnership teams should visit the identified sites to see if the methods used to make the estimates were appropriate and investigate whether a better method could have been used.

Stack parameters—The Partnership teams will contact the facilities and collect and verify stack dimensions and locations. If a GPS is available, the Partnership teams may want to use it to verify emission locations. While at the facility, the Partnership teams should assess whether or not the buildings at the facility affect how the stack releases disperse into the surrounding area. If the buildings affect a chemical emission, downwash effects may need to be included in the ISCST modeling runs, and building dimensions will have to be collected.

Optional fugitive source dimensions for fugitive source modeling—The dimensions of areas at each facility where fugitive emissions occur if the technical team chooses to model fugitive emissions using the ISCST area source option.

Stationary Area Sources

The concentrations estimated for area sources in the Secondary Screen will likely be used again as the Final Screen estimations. The partnership should review the area source concentrations and determine if any further work is necessary to refine the estimated concentrations. This would involve revisiting the assumptions used for

Chapter 12: Final Screen

• Technical Guidance

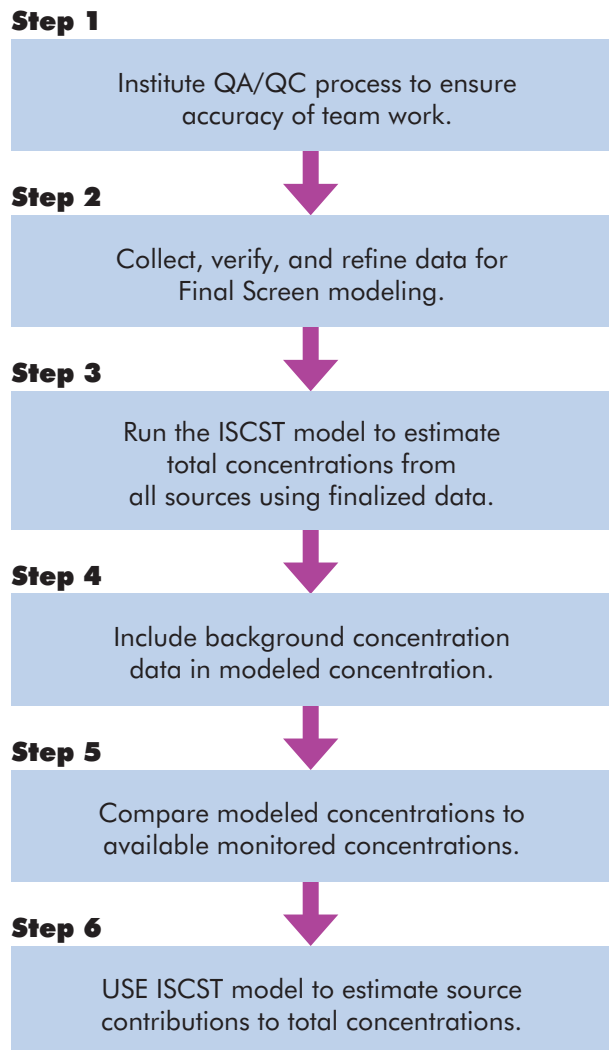


Figure 12-1.
Procedure for Final Screen

the pseudo-point source methodology during the Secondary Screen.

If the area source contributions are significant to the overall analysis, the Partnership may want to consider the use of an alternative to the pseudo-point modeling method used in the Secondary Screen. Stationary area source releases can be modeled as emissions released uniformly over the area of the census tract rather than combining the releases into five pseudo-stacks as done in the Secondary Screen. If GIS resources are available, this can be accomplished using the area source modeling option in ISCST and information on census tract boundaries. The documentation of the method is in preparation and should be available on this How-To Manual's website at: <http://www.epa.gov/oppt/cahp/howto.html>.

Mobile Sources

The Partnership may decide that it has sufficient information to target mobile sources following the Secondary Screen. Refer to the discussion of mobile sources in the Final Screen chapter in the Overview. If the Partnership decides that more accurate estimations of mobile sources are necessary, the technical team will use the MOBILE6.2 model to estimate mobile source emissions and ISCST air dispersion model to estimate concentrations. To run these models, the technical team will need to collect detailed information on traffic, fuels used, and the locations of main roadways and intersections in the Partnership area. Additional information on significant non-road sources may also be required. Examples can be found in the following references:

Stein, B., Walker, D. Cook, R. and Bailey, C. 2003. *Link Based Calculation of Motor Vehicle Air Toxics Emissions Using MOBILE6.2*. EPA Office of Air Quality Planning and Standards. 12th International Emission Inventory Conference. April 29–May 1, 2003, San Diego, CA.

Thomas, G. and Dudley, M. 2001. *Steps in Conducting an Urban Air Toxics Assessment: Methodology for Converting Emissions Inventories into Model Ready Input Files*. USEPA Office of Air Quality Planning and Standards. 10th International Emission Inventory Conference. May 13, 2001, Denver, CO

Kinney, EJ., Touma, JS, R. Mason, J. Thurmon, A. Beidler, C. Bailey and R. Cook. 2004. *Allocation of onroad mobile emissions to road segments for air toxics modeling in an urban area*. Transportation Research Part D: Transport and Environment. 9(2) 139-150.

Background Concentrations

Background concentrations are releases that are not the result of current human activity, including both natural and past human sources. The background concentration of a chemical of interest, if available, will be used the same way it was in the Secondary Screen. It will be added to the modeled concentration estimates to get the total concentration of the chemical.

What are the steps the technical team will need to take to complete the work of estimating concentrations for the Final Screen?

- Step 1:** Institute QA/QC process to ensure accuracy of team work.
- Step 2:** Collect, verify, and refine data for Final Screen Modeling.
- Step 3:** Run the ISCST model using finalized data to estimate total concentrations from all sources.
- Step 4:** Add background concentrations to modeled concentrations.
- Step 5:** Compare modeled concentrations at monitoring site to available relevant monitored concentrations.
- Step 6:** Use the ISCST model to estimate source contributions to total concentrations for all chemicals with estimated concentrations greater than screening-level concentration.

How will the Partnership teams complete these steps?

Step 1: QA/QC

Refer to the QA/QC section (step 1) in Chapter 9 in the Technical Guidance section.

Step 2: Collect, verify, and refine data and methodologies used in Secondary Screen

The technical team will work with the teams organized by the Partnership to collect the detailed information that will be needed for the Final Screen. Teams will contact facility managers and visit stationary point sources to collect the information that will be needed for the Final Screen.

If the Partnership decides to refine its mobile source on-road estimations, a team will work with transportation department officials to collect the information needed to run the MOBILE6.2 and ISCST models. For detailed guidance on mobile source modeling using MOBILE6.2, *the Technical Description of the Toxics Module for MOBILE6.2 and Guidance on Its Use for Emission Inventory Preparation* (EPA 420-R-02-029, November 2002) can be found at <http://www.epa.gov/otaq/models/mobile2/r02029.pdf>.

If there is a significant non-road source or sources in the Partnership area, such as an airport, railroad yard, port, or heavy construction site with significant non-road emissions, the Partnership may decide to refine its non-road source estimations.

Step 3: Run the ISCST model using finalized data to estimate total concentrations from all sources.

Once the information from steps 1 and 2 has been collected, it needs to be put into a data input file for the ISCST and/or MOBILE6.2 modeling runs. As mentioned in the Secondary Screen, the input file format for modeling are very specific. The Partnership teams should consult the discussion about ISCST input files in the Secondary Screen section and volume 1 of the ISCST user's guide (or commercial software support documents) to determine the specific data file format requirements.

Step 4: Add background concentrations to modeled concentrations.

Background concentrations are levels of chemicals that occur naturally in the study area and cannot be attributed to any of the stationary point, stationary area, or mobile sources that have been identified. In the development of the Emission Source Inventory, background concentrations were identified for the various chemicals of concern. These values should be added to the concentrations developed from ISCST to estimate the total ambient concentration. The technical team should assume that the background concentrations collected in the emissions inventory are uniform throughout the study area and are the same at each receptor location.

Chapter 12: Final Screen

• Technical Guidance

Step 5: Compare modeled concentrations at monitoring sites to available monitored concentrations.

If the Partnership has access to monitoring data for the study area, the technical team should use this data for comparison purposes with the ISCST model results. If the differences between the monitoring data and the modeled data are more than an order of magnitude, the technical team should review the values used during the modeling to identify the source of the discrepancies.

Step 6: Use ISCST model to estimate source contributions to total concentrations.

The Partnership has identified a group of chemicals of concern and dropped other chemicals that are not of concern using the Secondary Screen. At this stage it is important to understand the contribution of each source of a chemical of concern to the concentration of that chemical from all sources at the receptor points chosen by the community. With this understanding it will be possible to identify candidate facilities for future voluntary emissions reduction efforts as well as the contribution of mobile and area sources to the concentrations of concern at the receptor points.

In order to determine individual source contributions to the total concentration of a chemical at a given receptor, multiple ISCST runs need to be made, as follows:

- Run ISCST for a single chemical and all sources of that chemical (stationary point, area, and mobile) using the best information available as collected in the Final Screen (e.g., measured or best estimated emissions, confirmed stack parameters and locations) and determine the chemical concentrations at the receptor locations of interest, including background concentration, if available.
- Edit input files or select options (as applicable) to model each source of the chemical one at a time and determine the concentration of the chemical at the receptor locations of interest. Be sure to treat area sources and mobile sources as groups of five pseudo-point sources in each census tract. When eliminating these sources to determine the contribution of a single point source of a chemical, all five pseudo-point sources in each census tract must be deleted or set to zero emissions.
- Determine the percentage of each source contribution to the total concentration at the receptor points of interest by dividing the concentration from the single source by the total

concentration from all sources determined in step 1. This can most easily be done by entering the data into a spreadsheet to carry out the calculations and save the information. In practice, it may not be necessary to account for 100% of the total concentration if it appears that there are only minor contributions from multiple facilities after greater than 95% of the emissions have been accounted for. The Partnership can make this decision if resources are limited.

When the results of this exercise are interpreted, more weight should be given to outcomes that indicate that stationary point sources are significant contributors than to those indicating that area sources are major contributors. For the stationary point sources, efforts have been made to refine the information on the emissions and stack characteristics as much as possible. Also, the results of ISCST modeling will be subject to less uncertainty than for area sources, where the uncertainty associated with emissions estimation, allocation, and the use of the pseudo-point source approach should be considered.

What is the next step after the technical team has estimated concentrations for the Final Screen?

Once the Final Screen concentrations have been estimated, the technical team should prepare a detailed report for the Partnership comparing estimated concentrations at each of the targeted community locations to the Partnership's screening-level concentrations. It may be helpful to include a ratio of the estimated concentration to the screening-level concentrations. For each chemical with a concentration above its screening level, the Final Screen summary report should also include a list of sources and their contribution, expressed as a percentage, to the total concentration. A graphical illustration of source contributions, such as a pie or bar chart, may be helpful. For the priority chemicals, it may also be helpful for the report to review and summarize all the information used to estimate concentrations and to develop the screening-level concentrations, describing any uncertainties and the overall level of confidence that the Partnership has in its analysis. The technical team will present this report to the full Partnership for discussion and approval and work with the full Partnership to help communicate the results of the screening to the community. This report will complete the technical work of the screening

process. The priority chemicals and sources are now identified and the next steps for the Partnership, discussed in the final chapter of the Overview, will be to communicate the results to the community, develop recommendations for reducing exposures to the priority chemicals, and mobilize the community to implement the recommendations. Appendix G includes a list of resources for risk reduction and pollution prevention.

