Section 10. Linkage to national monitoring strategy

The EPA in partnership with it's principal grantees; States, local agencies and Tribes, are formulating a national air monitoring strategy that strives to enhance the overall effectiveness of major regulatory based monitoring efforts throughout the nation. The continuous PM monitoring plan addressed here is a major sub-component of this more comprehensive air monitoring strategy. A brief overview of the air monitoring strategy with selected attachments is provided to understand the larger context of the of role of continuous PM monitoring in the nation's reshaping of air monitoring

The monitoring strategy includes establishing a future direction for the shape and scope of air networks throughout the United States. This direction must incorporate knowledge acquired in air quality research and management practices over the last two decades, and take advantage of the much of the existing infrastructure of operating networks and monitoring agencies. The experience over the last 20 years suggests three basic enhancements in national network design:

1) ***multiple and collocated pollutant measurements*** to better diagnose cause effect phenomena in health association and atmospheric process characterization efforts,

2) ***regional scale air quality characterization*** to understand the linkage between background and transport concentrations (regional, continental, global scales) as they impact both rural and urban environments, an increasingly important need as the separation between rural and urban air pollution levels continues to decrease.

3) ***accommodating new technologies*** to provide timely reporting of air quality information to the public and to improve basic characterization of physical, chemical, temporal and spatial composition of air quality.

Consistent with these enhancements, the strategy has identified needed improvements to the monitoring program:

- characterization of hazardous air pollutants (HAPs)
- continuous particulate matter monitoring
- information transfer and delivery
- integration across pollutant programs; and

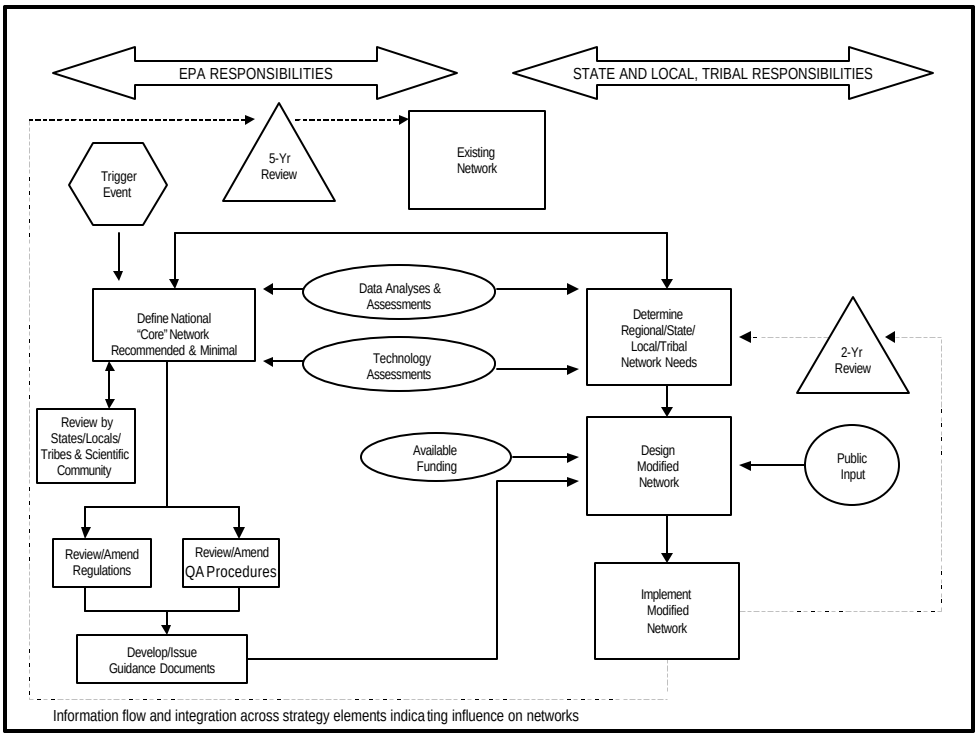
divestment in much of the existing criteria pollutant monitoring networks.

The strategy is challenged to create adequate flexibility for States, Tribes and local agencies to address area specific problems and simultaneously yield a core of consistent measurements nationally within an anticipated flat resource allocation. This strategy is being guided by the National Monitoring Steering Committee (NMSC), which combines a combination of monitoring and air program management leadership from States, local agencies, Tribes and EPA. The NMSC will be delivering

the strategy, which is largely a set of directional and specific recommendations for change in monitoring nationwide for broader public and scientific review in early 2002. Several efforts are underway to evaluate the effectiveness of existing networks and provide a vision for future operations, including:

- Development of network objectives and priorities to guide future investments and divestment;
- a network design proposal for nationally consistent multi pollutant measurement stations;
- National and regional based assessments of existing criteria pollutant networks that attempt to identify existing opportunities for criteria monitoring divestment;
- modifications of existing regulations and quality assurance practices to implement the recommendations emerging from the assessment; and
- accommodation of advanced monitoring and information transfer technologies to enhance scientific value of data collected and dissemination of public information.

Figure 1 illustrates the information flow across these various components.



This PM continuous monitoring implementation plan provides a test case for this important fifth element of the air monitoring strategy, and the ability to implement continuous monitors is impacted by all of the strategy elements. The broader vision for a PM network includes an integrated hybrid network of filter based and continuously operating samplers. The current $PM_{2.5}$ network of

approximately 1100 integrated samplers (FRMs) and nearly 200 "uncoordinated" continuous samplers should evolve into a system of perhaps 700- 1000 $PM_{2.5}$ samplers with a more even distribution (e.g., 50-50) of integrated and continuous methods. The continuous methods must be integrated to ensure data compatibility with the current FRM network . Currently, EPA provides only limited specification on operational guidance or performance expectations for continuous samplers, which limits the ability to utilize many of the existing continuous monitors to support an array of spatially oriented data uses such as model evaluation and PMF applications. Currently, only a very small fraction of continuous monitors enhance the spatial depth of the existing FRM network The challenge in this strategy is to maximize the benefit of continuous samplers so that data analysts are not constantly confronted with screening out instrument types for non regulatory use. This goal is challenged further by an existing inventory of diverse methods using various measurement principles, and the recognition that the measurement from an integrated sampler in many instances has several inherently different (and meaningful) physical and chemical features with respect to a filter measurement.

Assuming no new resource initiative for PM monitoring, resources for the enhancement and integration of continuous monitors will largely come from the existing resource base. This assumption implies a substantial reduction of FRM operations to free resources for operation of continuous samplers. The assessment work (element 3) to date has identified several areas where there is redundancy of samplers and therefore the potential for a reduction of FRM monitors. EPA needs to develop specific guidance for selecting candidate sites for removal based on the assessment and related spinoff products. Such guidance would incorporate design objectives that seek to eliminate sampling redundancy through correlation or related analysis, and enhance spatial coverage through mapping and kriging approaches. EPA will deliver this guidance in mid-2002. Meanwhile, a set of specific recommendations to modify existing PM monitoring regulations will be delivered as part of the strategy in early 2002. These modifications will reduce the number of required $PM_{2.5}$. FRM sites to free operational resources and enable agencies to invest in continuous methods. The recommended revisions must address the performance expectations and test requirements for Regionally Equivalent Monitors (Section 4) and lay out the basic network design framework (Section 5) expected for an integrated $PM_{2.5}$ system.

The NMSC has identified a national need to move toward a multi pollutant network that emphasizes hazardous air pollutants, continuous PM and advanced information transfer technology. In addition to addressing methods, the technology component (element 5) of the strategy provides the rationale and approach for enhancing information transfer and data analysis to increase data usage. The network design effort (element 2) is recommending a set of National Core (NCore) multi pollutant monitoring sites located in major metropolitan areas and selected rural environments. The goals of these sites include assistance for health and exposure studies, air quality management and monitoring m methods. The research community should realize long term benefits from these goals, which are similar to the objectives being addressed in the existing Supersites program. The use of these NCore sites to serve as multi pollutant methods platforms that collocate continuos and integrated PM measurements is critical to the long term integration of continuous and filter based methods. The relationship between a continuous sampler and an FRM is impacted by composition and meteorology which vary in time and space. The NCore platforms could maintain system integration by supporting iterative review of the statistical relationships between collocated integrated and continuous methods as aerosol composition changes arise from future demographic shifts and implementation of emission reduction strategies.