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Overview Plan for Ambient Air Monitoring After Hurricane Katrina

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I. Introduction and Purpose

This document provides an overview of ongoing and planned ambient air monitoring in the areas affected by Hurricane Katrina, describing the various elements of the monitoring effort and how they relate to each in terms of objectives, timing, and methods. The monitoring effort is aimed at providing air quality data in situations in which air quality may be adversely affected by the direct storm effects (flooding, destruction of buildings and their contents, damage to industrial facilities, etc.) or by activities aimed at clean up, start-up of industrial facilities, infrastructure restoration, rebuilding, and reoccupation. This document identifies certain situations which appear to be priority candidates for ambient air monitoring, types of monitoring that will obtain appropriate data about air quality in these situations, and planned uses of the ambient data collected.

This document has been coordinated with more detailed technical documents that will be used by the Incident Management Team's Environmental Unit and other personnel who will actually implement and operate the monitoring systems described herein. These other documents include:

- Quality Assurance Sampling Plan for Operational Air Evaluations at the Hurricane Katrina Response in Louisiana, September 21, 2005.
- Air Monitoring and Contingency Plan forHurricane Katrina Debris Activities - Louisiana, September 2005.
- Putative Inhalation Risk Air Monitoring Plan – Hurricane Katrina Louisiana/Mississippi, September 2005.

The titles of these documents may change with their next revision.

It is reasonable to expect that as recovery operations progress, local air monitoring situations will change requiring flexibility and additional plan modification. Therefore, needs for specific situations which are not addressed by this document or those listed above (the ERT plans) will be developed by an appropriate organization with EPA guidance and amended to this Overall Plan. In particular, EPA may establish additional monitoring requirements to more specifically address asbestos demolition and disposal operations. EPA will coordinate the implementation of all monitoring to avoid duplication or interference of efforts.

Knowledge of the situation on the ground and of the post-storm plans of various units and levels of government is evolving, and will continue to shape the details of implementation such as specific monitoring sites, funding and staffing, sources of needed monitoring hardware, etc.[a] EPA Offices and

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[a] Information on debris management plans for Louisiana is provided in *DEBRIS MANAGEMENT PLAN HURRICANNE KATRINA DR-FEMA-1603-LA,* September 2005. Information on debris management

the affected states will work together to address these dynamic concerns. The need to determine and address heath concerns will be addressed first with available equipment taking into consideration site conditions. The air pollutants identified in this plan for sampling and analysis shall be reviewed from time to time in light of the area conditions, availability of sampling and monitoring equipment, and site specific contaminates to be assessed.

An earlier draft of this document was the subject of a consultation with a workgroup of EPA's Science Advisory Board (SAB) held on September 14, 2005. The document has been revised in light of the comments received, and may continue to evolve. Information on the SAB review is posted at **http://www.epa.gov/sab/hurricane_katrina_wg_activities.htm.**

II. Air Quality and Public Health Situations Addressed

On August 29, 2005, Hurricane Katrina made landfall near New Orleans, Louisiana (LA) breaching the levees that protect the city from Lake Pontchartain. The hurricane also damaged the coastal regions of southern Louisiana, southern Mississippi, and southern Alabama. The storm and efforts to deal with its aftermath have or may create the following situations which are special interest from an air quality perspective.

Flooded Areas

The air quality in New Orleans and other areas in the three-state region that experienced flooding may be adversely affected by a mix of fuels and chemicals spilled as a result of storm damage. This situation is likely to be relatively short term as flood waters drain, volatile material evaporates away, and industrial facilities stabilize their operation. It has been noted that since flood waters in New Orleans are being transferred to Lake Pontchartrain, the lake may be a longer term source of both gas phase and particle phase pollution deriving from material that was mixed into the flood waters.

After flood waters are gone, the air quality may be affected by flood-contaminated dust that is re-entrained by vehicle traffic, construction/demolition equipment, etc. This situation may develop according to the number of people and equipment active in these areas, and may continue until contaminated dust is washed away naturally, removed, or otherwise stabilized. This dust may contain biological organisms, metals, and low volatility organic compounds from spills. It was noted during the SAB workgroup consultation that the multiple spills and releases from Katrina may have produced mixtures of chemicals that have not been studied before, which may yield unexpected emission products when dust is resuspended.

Areas Damaged by Flood or Winds – Other Considerations

As chemical plants and refineries resume operation there may be high start-up emissions. While initial emergency response efforts will address known spills and continuing leaks, there is a possibility of less obvious fugitive leaks in pipes and tanks taking longer to identify and repair.

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plans for Mississippi is provided in DEBRIS MANAGEMENT PLAN HURRICANNE KATRINA REGION4-EPA-MS. EPA has also issued guidance documents on demolitions and debris burning for Katrina-affected areas: *EMERGENCY HURRICANE DEBRIS BURNING GUIDANCE* and *DEMOLITION GUIDANCE FOR STRUCTURALLY UNSOUND BUILDINGS DAMAGED BY HURRICANE KATRINA.*

Air quality may also be affected by other pollutants created by recovery activity and natural processes such as decay of biomass. Pollutants may include SO2, H2S, VOCs, NOx, and particulate matter from portable generators and mobile sources used in the recovery.

It seems likely that the destruction of buildings by the storm itself did not release large quantities of asbestos, in that buildings were damaged by wind or water without pulverization. However, building demolition and debris loading may release lead from paint, asbestos from building materials, and other pollutants. Transportation of building and other non-biomass debris to disposal sites may also release contaminated dust from the transported loads. In areas that flooded, even "clean" biomass may be contaminated and release pollutants during handling and transport.

Open Burning of Biomass, Building Debris, and Other Debris

The volume of debris from the storm is so large that it interferes with recovery and rebuilding efforts. The responsible federal, state, and local agencies will be trying to dispose of debris quickly, but the effort is likely to take many months in some areas. As of this time, plans for clean up and disposal of debris from Hurricane Katrina are in the final stages of development of staging and burn site details in each affected state and are not well settled. The situation in New Orleans is particularly complex, given the large number of buildings damaged and the local interest in allowing business operators and residents to return in the near future.

In light of the uncertain and fluid situation, this draft plan contemplates that a variety of waste burning situations may occur. There may be some fixed-site open burning facilities established for disposal of wastes that will not be recycled or landfilled, with these wastes being transported to these sites by truck. These facilities are assumed to be operated or closely supervised by federal, state, and/or local government agencies. It is assumed that these facilities will remove from the burn stream any designated hazardous wastes where feasible, but that this exclusion will not be entirely effective. The burn stream may therefore contain some amount of such hazardous wastes as well as biomass from downed trees, dead animals, and various other anthropogenic wastes such as building demolition debris, commercial and household materials and products, etc. The degree of emissions control using equipment such as forced air curtains, if any, may vary from site-to-site and day-to-day. It is plausible that the number of these burning facilities may increase as debris removal efforts increase, and that such facilities may be in operation for as long as a year.

It is also likely that there will be open burning operations that will be active only long enough to deal with material in the immediate vicinity. Some of these may be permitted and supervised by a unit of government, but others may be conducted by individuals without formal approvals or permits. These may also involve a range of burned materials.

The complex mix of material that may be burned in all these situations means that emissions from the fixed-site facilities may contain various hazardous air pollutants. EPA anticipates that the organic compounds in smoke from open burning after Katrina will at least include all those observed in previous open burning studies but the relative amounts may be different. It was noted during the SAB workgroup consultation that the multiple spills and releases from Katrina may have produced mixtures of chemicals that have not been studied before, which may yield unexpected emission products when burned. Because of the possible presence of metals and asbestos in building debris, these may also be present in smoke from open burning after Katrina.

There may also be situations in which large quantities of a single type of material are burned, for example to dispose of wholesale quantities spoiled foodstuff and other ruined merchandise and materials. This may happen early during the recovery and be of short term duration.

Incineration of Dead Livestock

Dead livestock needs to be disposed of through burial and/or incineration. The US Department of Agriculture is working with its state counterparts on this issue. Where conditions allow it, carcasses may be buried. In some places, a high water table may prevent this, and carcasses may need to burned or transported out of the area.

III. Ambient Air Monitoring Program Objectives

The primary and most immediate objective of the monitoring program is to provide information for managing risks, in other words, to give people in the area – government officials, contractors, and private parties –information to guide their actions in ways that will reduce air concentrations and/or exposures whenever feasible to avoid unreasonable risks.

Information on air quality has already been used to identify chemical spills for the Incident Response Team to clean up. It will also be used, in conjunction with information on many other relevant factors such as drinking water supply, to guide government and private decisions about re-occupation. Air quality measurements near and downwind of specific clean up operations such as demolitions, debris handling, and open burning can provide valuable feedback to the management of those activities. Data might, for example, indicate that greater efforts are needed to separate material before burning. Air quality measurements may also suggest the existence of unexpected emission sources that need to be identified and addressed. The decision framework(s) and responsibilities for using air quality data in this way is beyond the scope of this document.

One risk management action that can be taken based on air quality is for individuals to change their activities, for example to avoid unusual physical exertion during periods or locations of higher air pollution. Also, individuals can seek medical advice if symptoms related to air pollution are experienced.

Given this primary objective, air monitoring should focus on pollutants and situations that have a reasonable likelihood of presenting risks significant enough to require feasible actions that would not otherwise be taken as a matter of standard practice in emergency response situations of the types that exist in the affected area. In addition, there is merit in some amount of precautionary monitoring for unexpected or low probability problems, particularly if marginal costs would be relatively low.

Also, air monitoring data sufficient to support the above objective likely will be useful for simply informing the public of the air quality, which is itself of value. It may also be useful in retrospective studies of the health and ecosystem effects of the storm and recovery activities. Finally, air quality data collected during the Katrina recovery may be useful in developing plans for responding to future disasters.[b]

The monitoring activities described here are not specifically designed to provide all appropriate information on the exposure of workers while they are actually occupied in clean up and recovery tasks.

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[b] Any emissions data collected during the Katrina recovery may also be useful in planning response efforts for future emergencies. This document does not address collection of emissions data.

There are independent requirements related to characterizing and managing worker exposure. There is some crossover of information between the two arenas. The measurement of chemical constituents in ambient air at population-oriented sites will provide some information on constituents to which workers may be exposed while on the job. Also, data from monitoring equipment used by workers to ensure safety on the job may give some indication of air quality data where power and conventional monitoring equipment are not yet available.

This monitoring plan is not aimed at estimating ambient concentrations except at the specific times and places monitored, or at providing data sufficient for such estimation by others. Absolute concentrations will vary widely with distance, burn volume, wind conditions, etc.

This program is not intended to provide data on local concentrations of criteria or hazardous air pollutants for SIP or conventional regulatory purposes, comparable to the data previously reported by state-operated ambient monitoring sites that were destroyed or disrupted by the storm or flooding. To obtain that data, the EPA and the affected states are working to restore those conventional sites. While this restoration is in general not considered to have as high a priority as providing information for guiding actions related to clean up and re-occupation, some types of monitoring equipment in this category can be useful for that purpose and will be given appropriate priority. Also, there may be opportunities to make progress on restoring the pre-storm monitors without detracting from the higher priority monitoring efforts.

This program also is not specifically designed to provide data to assess the impact of open burning activity and other disaster recovery activities have had on monitored concentrations of criteria pollutants (ozone, PM2.5, etc.) in the affected states or in downwind states. Similarly, it is not designed to evaluate whether displaced emissions generating activity has affected areas outside the recovery area itself. Nevertheless, the data collected under this program may be useful in future assessments of whether the monitoring data for criteria pollutants should be excluded or adjusted for nonattainment findings or other regulatory purposes.

The Center for Disease Control and Prevention/Agency for Toxic Substances and Disease Registry (CDC/ATSDR) is working closely with EPA and is providing technical support for the chemical and biological aspects of the post-Katrina situation. EPA has and will continue to make measurements for chemicals and pathogens in flood waters in New Orleans, other water bodies, and drinking water systems. As outlined in this plan, EPA will make measurements for chemicals and physical airborne contaminants. EPA will continue to provide CDC/ATSDR with the results of all the environmental monitoring. CDC/ATSDR will provide EPA with its technical review of the sampling results (e.g., what are the public health implications) and will assist in the development of joint public information/public health messages concerning the sampling results.

Although infectious diseases are a frightening prospect, widespread outbreaks of infectious disease after hurricanes are not common in the United States. Rare and deadly exotic diseases, such as cholera or typhoid, do not suddenly break out after hurricanes and floods in areas where such diseases do not naturally occur, such as the United States. In general, the biological pathogens found in flood waters from the recent hurricanes are related to sewage and are mostly a health concern if people ingest the pathogens (e.g., eat or drink contaminated food and water). It should be noted that there are not any conventional methods for monitoring sewage related pathogens in ambient air. Therefore, it is the opinion of CDC/ATSDR that ambient air monitoring for the pathogens that maybe related to the flood waters is not necessary. Information regarding hurricanes and infectious diseases can be found on CDC/ATSDR's web site at: http://www.bt.cdc.gov/disasters/hurricanes/keyfactsinfectiousdisease.asp .

IV. Description of the Phased Monitoring Program

EPA began monitoring air concentrations soon after Katrina moved out of Louisiana, Mississippi, and Alabama. This monitoring followed established incident response procedures and was aimed at determining locations that needed Incident Management Team action to stop or clean up spills along with identifying potential safety issues for on-site personnel.

This comprehensive monitoring program will be implemented in phases, determined by the immediacy of the problem to be addressed, the availability of equipment, staff, and infrastructure for monitoring, and the evolving picture regarding plans for the clean up efforts and how and where they will generate emissions. The phases are not sharply separated even in a single location, but the phasing framework is useful for understanding the ongoing and planned activities even so.

Practical considerations are an important influence on this plan. For the most part, each phase is based on monitoring and data management approaches currently in routine use by EPA's Incident Management Team, EPA's headquarters and regional air program offices, or by state/local air management agencies in similar situations. This will allow rapid start up and will provide data types that are familiar to emergency managers, state and local officials, and the communities affected.

A. Phase 1 – Screening Data to Guide Emergency Response Efforts

Emergency Response to Spills

EPA's Incident Management Team has been and remains active in the affected areas. The earliest efforts used equipment mounted in a small aircraft that can obtain detailed information on chemicals in the air from a safe distance. The equipment - Airborne Spectral Photometric Environmental Collection Technology (ASPECT) - is an emergency response sensor package operated by EPA. It provides first responders - emergency workers on scene with information on possible chemical releases. ASPECT is also capable of collecting high-resolution digital photography and video and can take thermal and night images by using instruments that track differences in heat below the airplane.

The Department of Energy has made available an aircraft with additional monitoring capabilities compared to ASPECT, and some flights with this aircraft have also taken place. More may be planned as needed.

More information on the capabilities of this system is available at
http://www.epa.gov/naturalevents/flyinglab.htm

This system provides data to direct emergency responders to locations where spills need to be stopped or cleaned up. It is not designed to monitor ambient air quality over long periods or areas, and is mentioned and described here primarily to avoid misunderstanding of its purpose.

In addition, as in any emergency response incident, EPA's on-site coordinators (OSCs) and contractors have been doing source specific air sampling on the ground using portable sensors where safe access by ground is possible and there is reason to suspect a spill or release.

Monitoring of Air Quality Above and Near Contaminated Flood Waters

The concern with respect to flood waters in New Orleans has been to locate any preventable continuing releases into the waters or air above them, and to provide information on any health risks to those assisting in evacuation and other efforts above or near the flood waters.

Two of EPA's Trace Atmospheric Gas Analyzer (TAGA) units have been deployed to New Orleans. The TAGA buses are self-contained mobile laboratories capable of real-time sampling and analysis in the low parts per billion level of outdoor air or emissions from various environmental sources and concerns. This is providing information on how contaminated flood waters and other pollutant releases are affecting air quality in New Orleans at present. TAGA's initial deployment will last two weeks. More information is available at http://www.epa.gov/earth1r6/6lab/taga.htm.

Data from the ASPECT and TAGA operations are being posted on EPA's Katrina response webpage; see http://www.epa.gov/katrina/testresults/air/index.html.

Other Relevant Information

The above monitoring is using methods that are the best available for the conditions under which they must be used. Portability, real time or at least rapid data reporting, and self-contained power supply are key considerations. The methods give screening level data, and in general the reported concentrations cannot be directly compared to established health benchmarks for various reasons including sampling period, data quality, or differences in exactly what is measured versus the compounds for which health benchmarks exist.

The Louisiana Department of Environmental Quality (LDEQ) has conducted sampling for volatile organic compounds in New Orleans using Summa canisters, mostly in response to specific reports of possible problems requiring response action. EPA will work with Louisiana DEQ to ensure these data are available to EPA and the public, for data that is of continuing relevance. This data should be of a quality that will allow comparison to health benchmarks, aside from the issue of sampling/exposure period differences.

While not specifically described here, similar monitoring to direct emergency response efforts has also been underway in Mississippi and Alabama. The situations to be investigated have involved spills and leaks, rather than standing flood waters.

Because the purpose of this monitoring is to direct immediate response efforts, it evolves quickly. The above descriptions are not necessarily complete or up-to-date.

B. Phase 2 – Data to Guide Initial Re-Occupation Decisions for New Orleans

As of this date, re-occupation of sections of New Orleans is under active consideration by city, state, and federal authorities. The Mayor has asked EPA to provide an assessment of the situation, of which air quality is one of several factors. While the monitoring in New Orleans to date generally have not found air pollutant concentrations that gave any obvious reasons for concern with respect to short term health effects from the pollutants measured, EPA is undertaking additional measurements.

Re-occupation also is an issue in the affected areas outside of New Orleans.

At times and places in which power was not available in New Orleans, equipment for assessing ambient air quality remained limited to the same types of self-sufficient monitors as used in guiding responses to spills and measurements acquired during Phase 1. These measurements included TAGA-based measurements at additional locations. Also, PM measurements have been made using DataRAM nephelometers, which provide an approximate measure of inhalable particulate matter. Some toxic gas measurements have been made using a hand-held gas analyzer (AreaRAE). However, battery powered PEP and EBAM systems are currently being deployed that will provide increased accuracy in PM measurements.

At this time, monitoring operations have resumed at the state-operated Kenner monitoring site, on the western edge of the city near Lake Pontchartrain. These include real-time PM2.5, some criteria pollutant gases, and VOCs by Summa canister. The data that is available can be considered in the re-occupation decisions, but its relevance is limited by the site's particular location.

The Environmental Unit of EPA's Incident Response Team is deploying a variety of monitors capable of giving more definitive data than can be obtained by the monitoring described above. These monitors will be placed in areas of current or potential general population exposure. The pace of deployment will be determined by the availability of equipment, personnel, trainers, and sites with appropriate security and power (where applicable).

The following types of monitors are planned. The attached "Timeline" provides more information on their operation and objectives. In New Orleans, all these monitors will be collocated at sites that will initially be considered fixed, but may be relocated as more is learned. About 19 population-oriented sites have been tentatively identified in New Orleans for these monitors. The Kenner site is one of the 19 sites, and will be operated every day. During the period in which equipment is not yet available to operate all 19 sites, other sites for sampling will be chosen daily based on which of the other 18 sites are in the vicinity of the most potentially problematic emissions-generating activities expected to occur that day. This may be open burning, debris handling, or ground and road activity that can resuspend contaminated dust. Another five fixed or movable sites may be established depending on equipment and lab services availability. On the advice of the SAB workgroup, EPA is not planning on "chasing plumes" with any of the PM samplers.

- Portable, battery powered continuous PM monitors based on beta attenuation with real time satellite data upload (EBAMs). These can be configured to measure either PM10 or PM2.5. These units also measure wind speed and wind direction. Initially, these monitors will be used mostly in the PM10 mode and will allow characterization of PM levels without having to rely on the much more uncertain DataRAMs. The first of these monitors to be deployed have been loaned by air agencies in other states. Those units may be supplemented by new purchases.

- Small battery-powered samplers normally used for personal exposure monitoring of workers, but in this case deployed as interim fixed-site monitors in areas where regular monitors for the same pollutants cannot yet be deployed because of lack of equipment, power, or laboratory services. Monitors in this category in New Orleans will collect samples for asbestos (NIOSH method 7402), VOCs (by carbon tubes), total PM for metals analysis, total PM for particulate mercury analysis, and semi-volatile organic compounds (by XAD). Sampling periods will be 24 hours, except where battery power limitations dictate a shorter sampling period. Filters and other media from this sampling will be analyzed by labs under contract to the Office of Emergency Management, which is most familiar with this type of monitoring.

- Passive badges for organic VOCs samplers normally used for personal exposure monitoring of workers, but in this case deployed as interim fixed-site monitors in areas where regular monitors for the same pollutants cannot yet be deployed because of lack of equipment, power, or laboratory services. 72-hour samples will be collected using 3M Organic Vapor Monitors

(OVM) for long term integrated VOC concentrations, on a weekly basis. These have the advantage of being usable for longer sampling periods, since they are not limited by battery life. Because these badges have much the same objective as the pump-sampled carbon tubes for VOCs mentioned above, the use of both will be reconsidered after a period of using them in collocated fashion. The badges will be analyzed by a laboratory at the University of Houston under the direction of EPA Region 6's Multimedia Planning and Permitting Division, which is most familiar with this type of monitoring.

- Battery powered, filter-based PM samplers (24-hour low flow rate Federal Reference Method samplers). These can be configured to measure either PM10 or PM2.5. Initially, samples will be taken daily and analyzed for both mass and toxic metals. Usually, PM2.5 and PM10 low flow FRM samplers will be collocated to allow better understanding of the size distribution and hence transportability of the PM. Collocation may also allow a rough attribution of the PM between resuspended dust (which will mostly be in the 2.5 to 10 size range) and PM from open burning (which will mostly be in the 2.5 and smaller size range, depending on the quality of the burning). The first of these monitors to be deployed have been diverted from their normal use performing audits of state-operated monitoring sites in EPA Regions 4 and 6 not affected by the storm. A number of new units will be procured to allow additional sites to be monitored and/or to allow the diverted units to be returned to their previous use. PM filters from these samplers will be analyzed by labs under contract to the Office of Air Quality Planning and Standards, which is most familiar with this type of monitoring and lab work.

- Filter-based PM10 high-volume samplers powered by portable generators. This is not a preferred approach to PM10 sampling for a number of data quality and practicality reasons, but is being pursued as an interim approach to get more of the planned PM monitoring sites operational sooner. These samplers were more quickly available to the monitoring effort than the new purchases of low flow FRM samplers mentioned above. Initially, samples will be taken daily and analyzed for both mass and toxic metals. When sufficient low flow PM samplers are available, the high volume PM10 samplers will be removed from this service, but may be applied in other ways depending on conditions.

- Full air toxics sites, identical to those that comprise the National Air Toxics Trends Sites. Equipment and lab services are being arranged to establish two such sites in New Orleans. These will be located at the pre-storm Kenner site and at a new "Chalmette" site, which can provide the AC power and other necessary logistics. NATTS sampling equipment will collect volatile and semi volatile organic compounds, aldehydes, and high vol PM10 samples for 24-hour periods. These samples will be sent to a laboratory for analysis of multiple air toxics constituents. The laboratory will post the results to the Air Quality System (AQS), the EPA data base for ambient air monitoring data, from which it can be obtained by any interested organization or individual. The following website provides information on the type, capabilities, and operation of this equipment: http://www.epa.gov/ttn/amtic/airtoxqa.html. Filters and other media from these four air toxics sites will be analyzed by a laboratory under contract to the Office of Air Quality Planning and Standards. An EBAM unit with a meteorology monitoring package (wind speed, wind direction, temperature, pressure, and relative humidity) will be collocated at each full air toxics site to provide real time data upload of PM10 concentrations and meteorology parameters to AIRNOW.

These monitors provide the first definitive data on a variety of air pollutants of concern from a re-occupation perspective. Except for the real-time PM2.5 data provided by the restored pre-storm state monitoring sites and by the battery-powered, portable EBAMs, there will be a time delay in the availability of results from the filters or other collection media for the remaining monitors, which must be sent to a laboratory for analysis.

The re-occupation issue will likely remain active over an extended period as the situations in each part of New Orleans and other affected areas change. This includes the effects that clean-up activities, which may result in new emission sources whose air quality impact may be important in considering whether more residents and businesses should return.

Information from the most recent testing in New Orleans will continue to be posted on the EPA Katrina response webpage.

C. <u>Phase 3 – Air Quality Effects of Clean-Up Activities</u>

For New Orleans and the nearby affected areas, the monitoring sites and samplers described for Phase 2 will also be the core monitoring network for characterizing ambient air quality in areas accessible to the public and off-duty response workers during the clean-up phase. The 19 planned sites are distributed throughout the areas where clean-up activities are expected to be most intense, yet are population oriented. In Phase 3, open burning/incinceration is likely to be the activity of most concern, and sampling sites will be selected from among these 19 sites based mostly on proximity to open burning/incineration operations, if not all can be operated at once. On the advice of the SAB workgroup, EPA is not planning on "chasing plumes" with any of the PM samplers.

For coastal Mississippi, fewer types of monitors will be deployed and fewer sites will be used, because of differences in conditions.

- In Mississippi, conditions allow the use of AC-powered TEOM-based real time PM2.5 and/or PM10 analyzers, so EBAM units may not need to be utilized there.

- VOCs, semi-volatile organic compounds, total PM metals, and mercury in total PM will not be sampled using the personal sampling pumps, but this may be reconsidered later.

- Passive badges will not be deployed in Mississippi because of the lack of standing flood waters contaminated by spills of organic liquids.

- Monitoring operations for AC-powered real-time and filter-based 24-hour PM2.5, PM10, and ozone have partially resumed at two pre-storm monitoring sites in coastal Mississippi: Gulfport and Pascagoula.. These will be supplemented by the addition of a new PM2.5/PM10 site at Stennis Space Center. Toxics metals will be measured on PM2.5 and PM10 filters collected with low flow FRM samplers at these three sites. These three sites will be equipped with asbestos samplers.

- Five additional sites measuring PM2.5 and PM10 (including toxics metals) may be established as more becomes known about demolition and open burning activities, and may be relocated from time to time as these activities evolve. These five sites will be equipped with asbestos samplers.

- Full air toxics monitoring will be added at the Gulfport and Stennis sites. An EBAM or TEOM unit with a meteorology monitoring package will be collocated at these sites. In addition, sampling frequency for air toxics will be increased at least temporarily at the Pascagoula site, which already sampled for air toxics prior to Katrina. Also, the air toxics site in Tupelo, in northern Mississippi, will be increased and used as a control site to help interpret concentrations observed in coastal Mississippi.

As more is learned about the nature and location of clean up activities, EPA will reconsider the number and location of monitoring sites. Information from ambient monitoring during the clean up periods in Louisiana and coastal Mississippi will continue to be posted on the EPA Katrina response webpage.

EPA will investigate how to link the ambient monitoring data to whatever information is available, if any, on nearby burning facility operations (burn volume, source and nature of material burned, control type, etc.).

EPA is consulting with other federal agencies on how the federal government can best assist federal, state, and local officials to have access to predictions or tools for predicting the land areas likely to be affected by smoke from open burning each day. This information can be used both to advise residents and to manage burning activities.

D. Phase 4 - Restoration and Enhancement of Pre-storm Ambient Monitoring Systems

Five conventional monitoring sites in New Orleans that were destroyed in the storm and flood will be re-established. This monitoring will include ozone, SO2, H2S, CO, PM2.5, PM10, NOx/NO2, and VOCs in various combinations at these five sites.[c] Priority will be given to restoring or adding PM2.5, PM10, SO2, and H2S capabilities, as these are deemed more relevant to the dust, combustion emissions, industrial start-up and lingering fugitive emissions, and other exposures that may face clean-up and recovery workers and others returning to the city. However, if other lost capabilities can be restored soon without sacrificing emergency-oriented monitoring work, they will be. None of these sites hosted a PM2.5 speciation sampler prior to Katrina. However, PM2.5 and PM10 filters from one or more of these sites can be analyzed for metals and other elements. This will be done at least some of the time. Most of these sites cannot resume operation until power is restored and new equipment obtained. As mentioned earlier, the Kenner site is at least partially operational now.

The SAB workgroup pointed out that depending on the pattern of re-occupation and emissions generating activity, the pre-storm sites may not meet logical siting objectives, both immediately and in the long run. EPA's practice is to have state and local officials make recommendation on this issue, and will await their long term recommendations.

Conventional monitoring sites will also be restored in the coastal area of Mississippi. Some of the previous equipment survived, but some needs to be replaced.[d]

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[c] The tentative plan is to establish the following combinations of monitoring capabilities in New Orleans:
Kenner site: PM2.5, NOx/NO2, SO2, H2S, CO, PMcoarse, VOCs, meteorology.
City Park: NOx/NO2, CO, PM2.5, PM10, SO2, VOCs, meteorology.
Arabi: SO2, CO, PMcoarse, VOCs, meteorology.
Meraux: PM2.5.
Chalmette: This is a new site that was in preparation prior to Katrina. VOC measurement at the site is relevant to Katrina monitoring objectives.

[d] The following equipment needs to be obtained for sites in coastal Mississippi:
Pascagoula – FRM PM10 and PM2.5 (this site also monitors for air toxics)
Port Bienville - NO2, O3, PM2.5-FRM
Waveland - O3, PM2.5-FRM
Gulfport - O3, PM2.5-FRM+Continuous+Speciation
Pearlington - PM2.5-FRM

Conventional monitoring sites in Alabama were not significantly harmed by the storm.

E. Special Interest Pollutants and Other Monitoring Methods

Asbestos

Given the age of the architecture and the amount of demolition that may be needed in New Orleans, there is the possibility for release of asbestos. Some commercial and industrial facilities known to have special asbestos management issues before the storm will receive special attention by state and federal officials if they are demolished or subject to renovation. The asbestos NESHAP covers demolitions of buildings, both structurally sound and unsound buildings. It does not regulate the debris that is a direct result of the Hurricane completely demolishing a building. Releases may occur from demolition, sorting and piling, loading into trucks, transportation, and unloading. Open burning could also release asbestos if asbestos-containing materials are not well separated. These sources of asbestos may also exist in other affected areas to some degree.

Asbestos monitoring is frequently a part of emergency response activities. Asbestos monitoring can be used to check on the effectiveness of initial efforts to minimize asbestos emissions. As described under Phases 2 and 3 above, small personal-exposure samplers will be used in fixed-site mode, and a standard NIOSH filter analysis will be followed by a NIOSH-certified laboratory to obtain quantitative results.[e] Initially, these samplers will be placed at all monitoring sites described under Phases 2 and 3 as having low flow FRM PM2.5 and PM10 monitoring. This includes the 19 tentative fixed sites and five possible additional sites in New Orleans and vicinity, and the Gulfport, Pascagoula, Stennis and five additional sites in coastal Mississippi. This initial plan for asbestos sampling will be reviewed periodically to consider whether the sampling should be made more or less intense depending on the amount of demolition, its apparent degree of control for asbestos releases, whether open burning is occurring, and concentrations observed so far.

Mercury

Some total PM filter samples (taken using the personal monitoring pumps at the fixed sites) will be analyzed for particulate mercury. While most mercury emissions would be expected to be in the gas rather than the particle phase, measurement of mercury from these total PM filters is an available screening approach. If measurable mercury is found, next steps will be considered.

Dioxins/Furans and PCBs

EPA has not yet finished coordinating internally regarding possible dioxin/furan and PCB monitoring objectives and approaches. PCBs have been spilled in the areas affected by the storm, and can enter the air by evaporation of by burning of PCB-contaminated debris. Open burning can produce dioxins and furans, but their production depends on the material burned and on burning conditions including the temperature and residency time during combustion. Some members of the SAB workgroup advised EPA not to rule out the possibility that inhalation exposures near open burning operations during the clean up period might be high enough to cause concern about health effects.

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[e] All samples will be run for "modified AHERA." The modified AHERA is a TEM method that counts all asbestos fibers>0.5um length, with 5:1 aspect ratio but results are reported in terms of fibers/cc, with two different counts reported: (1) all asbestos fibers, PLUS (2) the subset of fibers >5um length. A subset of the samples (2%) will be run by the ISO method to get the detailed fiber dimension information.

Other Pollutants, Monitoring Methods, and Systems

For Phases 1 and 2, EPA has deliberately not considered deployment of advanced monitoring systems that to date have been used more for special research purposes than for routine ambient air monitoring, including various open path methods other than those already part of the EPA and DOE aircraft systems described above. Such monitoring presents challenges in terms of coordination with those in control of such systems, logistical support, availability of and safety for qualified operators, contracting, interpretation of unfamiliar data streams, etc. Also, EPA presently believes that the large pollutant suite that can be monitored with the conventional methods planned for deployment as described is adequate for the objectives of the monitoring program. Once the planned sites with these conventional methods are well established, EPA may re-visit the issue of whether deployment of advanced systems is necessary and practicable.

EPA will also be assessing the possible role of satellite monitoring systems in helping to meet the objectives of this plan.

During interagency review of this plan, several suggestions were made for additional monitoring. These include measurement of the pH of re-suspended dust, phosgene, hydrochloric acid (HCl), and chlorine (or chloride), and mineral acids. These recent ideas will be considered and maybe added to this plan in a future revision. Toxic metals and pH cannot be measured on the same low flow FRM PM filter, but these analyses could be done on filters from alternate days or sites.

V. Responsibilities of Involved Offices and Agencies

EPA's Office of Emergency Management is planning and implementing the air monitoring for Phase 1. The Environmental Unit Air lead shall coordinate/implement/assist with operations. The Environmental Unit will also be responsible for implementing the remaining phases of the monitoring plan described in this document, with requested assistance from other parts of EPA. OEM will purchase most of the necessary sampling equipment. Data from direct-reading monitors (ASPECT, TAGA, DataRAMS, and AreaRAE units) operated by OEM personnel will be managed by OEM.

EPA's Office of Air Quality Planning and Standards has helped develop, review, and document the monitoring plan in consultation with the two affected Regional Offices and the Incident Management Team's Environmental Unit for New Orleans. OAQPS will facilitate resolution of roadblocks to implementation that cannot be resolved at the Regional Office level. OAQPS will also manage contracts for some or all needed laboratory analysis, especially for samples taken using equipment which OAQPS has arranged to provide. OAQPS is arranging the purchase of expendables and smaller equipment for some of the samplers. OAQPS has coordinated the loans of EBAM units from other states for use in New Orleans. OAQPS will also coordinate the collaboration with other federal agencies regarding smoke plume and cloud predictions, and regarding the possible role of data from satellite-based monitoring systems. OAQPS will operate the AQS and AIRNOW data systems. OAQPS, Regional Office staff, State, CDC/ATSDR and other EPA offices will collaborate on the development of public messages to explain data as it becomes available. OAQPS and the Office of Public Affairs collaborate on website design and operation.

EPA's Regional Offices 4 and 6 will be responsible for coordination with air monitoring auditing contractors (who will provide training and in some cases daily monitor operation services), state and local agencies, and EPA's on-site personnel to implement the plan. OAQPS and Regional Office staffs collaborate on the development of public messages to explain data as it becomes available.

EPA's Office of Research and Development (ORD) will continue to advise OAQPS and the Regional Offices on more detailed monitoring plans, and arrange for additional Science Advisory Board Review when appropriate. ORD is also considering possible projects to measure open burning source emissions as part of its research program on homeland security.

VI. Pollutants To Be Measured

Metals and other elements by ICPMS, as PM10 and as PM2.5:

Antimony
Arsenic
Beryllium
Cadmium
Chromium
Hexavalent Chromium (at full air toxics sites only, by separate high vol sampler)
Cobalt
Lead
Manganese
Mercury
Nickel
Selenium
Hexavalent Chromium
Potassium (on PM2.5 and PM10 filters from low flow FRM samplers, but not on air toxics PM10 filters from high vol samplers)
Calcium (on PM2.5 and PM10 filters from low flow FRM samplers, but not on air toxics PM10 filters from high vol samplers)

Toxic Gases at Full Air Toxics Sites:

Carbonyls
- Formaldehyde
- Acetaldehyde
- Acetone
- Propionaldehyde
- Crotonaldehyde
- Butyr/Isobutyraldehyde
- Benzaldehyde
- Isovaleraldehyde
- Valeraldehyde
- Tolualdehydes
- Hexaldehyde
- 2,5-dimethylbenzaldehyde

Metals
- Antimony
- Arsenic
- Beryllium
- Cadmium
- Chromium
- Cobalt
- Lead
- Manganese
- Mercuy
- Nickel
- Selenium
- Hexavalent Chromium

SNMOCs
- Ethylene
- Acetylene
- Ethane
- Propylene
- Propane
- Propyne
- Isobutane
- Isobutene/1-Butene
- 1,3-Butadiene
- n-Butane
- trans-2-Butene
- cis-2-Butene
- 3-Methyl-1-Butene
- Isopentane
- 1-Pentene
- 2-Methyl-1-Butene
- n-Pentane
- Isoprene
- trans-2-Pentene
- cis-2-Pentene
- 2-Methyl-2-Butene
- 2,2-Dimethylbutane
- Cyclopentene
- 4-Methyl-1-Pentene
- Cyclopentane
- 2,3,-Dimethylbutane
- 2-Methylpentane
- 3-Methylpentane
- 2-Methyl-1-Pentene
- 1-Hexene
- 2-Ethyl-1-butene
- n-Hexane

SNMOCs (cont.)
- trans-2-Hexene
- cis-2-Hexene
- Methylcyclopentane
- 2,4-Dimethylpentane
- Benzene
- Cyclohexane
- 2-Methylhexane
- 2,3-Dimethylpentane
- 3-Methylhexane
- 1-Heptene
- 2,2,4-Trimethylpentane
- n-Heptane
- Methylcyclohexane
- 2,2,3-Trimethpentane
- 2,3,4-Trimethylpentane
- Toluene
- 2-Methylheptane
- 3-Methylheptane
- 1-Octene
- n-Octane
- Ethylbenzene
- m/p-Xylene
- Styrene
- o-Xylene
- 1-Nonene
- n-Nonane
- Isopropylbenzene
- alpha-Pinene
- n-Propylbenzene
- m-Ethyltolune
- p-Ethyltoluene
- 1,3,5-Trimethylbenzene
- o-Ethyltoluene
- beta-Pinene
- 1,2,4-Trimethylbenzene
- 1-Decene
- n-Decane
- 1,2,3-Trimethylbenzene
- m-Diethylbenzene
- p-Diethylbenzene
- 1-Undecene
- n-Undecane
- 1-Dodecene
- n-Dodecane
- 1-Tridecene
- n-Tridecane

VOCs
- Acetylene
- Propylene
- Dichlorodifluoromethane
- Chloromethane
- Dichlorotetrafluoroethane
- Vinyl Chloride
- 1,3-Butadiene
- Acrolein
- Bromomethane
- Chloroethane
- Acetonitrile
- Trichlorofluoromethane

VOCs (cont.)
- Acrylonitrile
- 1,1-Dichloroethene
- Methylene Chloride
- Trichlorotrifluoroethane
- trans - 1,2 - Dichloroethylene
- 1,1 - Dichloroethane
- Methyl tert-Butyl Ether
- Methyl Ethyl Ketone
- Chloroprene
- cis-1,2-Dichloroethylene
- Bromochloromethane
- Chloroform
- Ethyl tert-Butyl Ether
- 1,2 - Dichloroethane
- 1,1,1 - Trichloroethane
- Benzene
- Carbon Tetrachloride
- tert-Amyl Methyl Ether
- 1,2 - Dichloropropane
- Ethyl Acrylate
- Bromodichloromethane
- Trichloroethylene
- Methyl Methacrylate
- cis -1,3 - Dichloropropene
- Methyl Isobutyl Ketone
- trans - 1,3 - Dichloropropene
- 1,1,2 - Trichloroethane
- Toluene
- Dibromochloromethane
- 1,2-Dibromoethane
- N-Octane
- Tetrachloroethylene
- Chlorobenzene
- Ethylbenzene
- m,p - Xylene
- Bromoform
- Styrene
- 1,1,2,2 - Tetrachloroethane
- o - Xylene
- 1,3,5-Trimethylbenzene
- 1,2,4-Trimethylbenzene
- m - Dichlorobenzene
- Chloromethylbenzene
- p - Dichlorobenzene
- o - Dichlorobenzene
- 1,2,4-Trichlorobenzene
- Hexachloro-1,3-Butadiene

SVOCs / PAHs
- N-Nitrosodimethylamine
- Pyridine
- Ethyl methanesulfonate
- 2-Picoline
- N-Nitrosomethylethylamine
- Methyl methanesulfonate
- N-Nitrosodiethylamine
- Phenol
- Pentachloroethane
- bis (2-Chloroethyl)ether
- Aniline

SVOCs (cont.)
- 2-Chlorophenol
- 1,3-Dichlorobenzene
- 1,4-Dichlorobenzene
- Benzyl alcohol
- o-Cresol (2-Methylphenol)
- 1,2-Dichlorobenzene
- bis(2-Chloroisopropyl)ether
- m,p-Cresol (3&4-Methylphenol)
- N-Nitrosopyrrolidine
- N-Nitrosodipropylamine
- o-Toluidine
- Hexachloroethane
- Acetophenone
- Nitrobenzene
- N-Nitrosopiperidine
- Isophorone
- 2-Nitrophenol
- 2,4-Dimethylphenol
- bis(2-Chloroethoxy)methane
- 2,4-Dichlorophenol
- 4-Chloroaniline
- 1,2,4-Trichlorobenzene
- Naphthalene
- 2,6-Dichlorophenol
- Hexachloropropene
- Hexachlorobutadiene
- N-Nitrosodibutylamine
- 4-Chloro-3-methylphenol
- Safrole
- 2-Methylnaphthalene
- 1,2,4,5-Tetrachlorobenzene
- 2,4,6-Trichlorophenol
- Hexachlorocyclopentadiene
- 2,4,5-Trichlorphenol
- 2-Nitroaniline
- Isosafrole
- 2-Chloronaphthalene
- 1,4-Naphthoquinone
- Dimethyl phthalate
- 1,3-Dintrobenzene
- 2,6-Dinitrotoluene
- 3-Nitroaniline
- Acenaphthylene
- 2,4-Dinitrophenol
- 4-Nitrophenol
- Acenaphthene
- 2,4-Dinitrotoluene
- 2-Naphthylamine
- Dibenzofuran
- Pentachlorobenzene
- 1-Naphthylamine
- Diethyl phthalate
- 2,3,4,6-Tetrachlorophenol
- 4-Nitroaniline
- 4-Chlorophenyl-phenyl ether
- Fluorene
- 5-Nitro-o-toluidine
- 4,6-Dinitro-2-methylphenol
- Diphenylamine
- Azobenzene

SVOCs (cont.)
- Phenacetin
- Diallate
- 4-Bromophenyl phenyl ether
- 4-Aminobiphenyl
- Hexachlorobenzene
- Pronamide
- Pentachlorophenol
- Pentachloronitrobenzene
- Phenanthrene
- Dinoseb
- Anthracene
- Carbazole
- Di-n-butyl phthalate
- Benzidine
- Isodrin
- Fluoranthene
- Pyrene
- 4-Dimethylaminoazobenzene
- Chlorobenzilate
- 3,3'-Dimethylbenzidine
- Butyl benzyl phthalate
- 2-Acetylaminofluorene
- 3-Methylcholanthrene
- 3,3'-Dichlorobenzidine
- bis(2-Ethylhexyl)phthalate
- Benzo(a)anthracene
- Chrysene
- Di-n-octyl phthalate
- 7,12-Dimethylbenz(a)anthracene
- Benzo(b)fluoranthene
- Benzo(k)fluoranthene
- Benzo(a)pyrene
- Indeno(1,2,3-cd)pyrene
- Dibenz(a,h)anthracene
- Benzo(g,h,i)perylene

VII. Laboratory Analysis

Louisiana DEQ's PM filter weighing laboratory was destroyed in the storm. PM filters will be weighed and analyzed for metals and other elements by laboratories under contract to OAQPS.

All pollutants from the full air toxics sites will be analyzed by laboratories under contract to OAQPS.

Samples taken using personal samplers operating in fixed-site mode will be analyzed by a laboratory under contract to OEM Asbestos analysis will be conducted by an American Industrial Hygiene Association (AHIA) asbestos-accredited lab under contract to OEM.

Passive badges for organic VOCs will be operated by a laboratory under contract to EPA's Office of Research and Development (ORD)..

VIII. Quality Assurance Activities

All field sampling and laboratory analysis will follow method-specific standard operating procedures and quality control requirements.

For the types of monitoring typically conducted in emergency response situations, OEM's normal methods and quality assurance requirements will be followed.

The EBAM, PM2.5/PM10 low flow FRM sampling, and full air toxics sampling described in this plan are not typical for OEM projects. In order to ensure monitoring takes place as soon as possible and data will meet the data quality needs, EPA will use the measurement quality objectives and standard operating procedures described in two national monitoring programs: the $PM_{2.5}$ program for particulate monitoring/analyses, and the National Ambient Toxics Trend Network (NATTS) for metals analyses. It is felt that the quality requirements described for these programs are adequate for this study. An attachment to this document contains QA requirements for samples collected from Louisiana and coastal Mississippi.

XI. Data Management

The general plan is for screening level data collected by the on-site response teams to be handled by established OSWER procedures, processed and made available for public access via the Agency Hurricane Katrina/Rita Response Web site. Data from laboratory analysis managed by OAQPS (PM2.5, PM10, PM metals, and air toxics), data from laboratory analysis managed by the on-site Environmental Unit of the Incident Management Team (asbestos and other pollutants collected with personal samplers used in fixed-site mode), and real-time continuous data will follow established EPA procedures, including state agency review, and ultimately reaching the AQS and AIRNOW data systems. Air data from these two systems will be presented along with data on monitoring of other media through a central data presentation system operated by EPA's Office of Environmental Information along with supporting information provided by OAQPS.

EPA will provide status reports and data from ambient monitoring through the Agency's Hurricane Katrina/Rita Response Web site. Monitoring data from all environmental media will be integrated into a central data system and will be accessed by the public through EPA's Web-based EnviroMapper tool. Real-time PM2.5 maps and time-series plots for monitors located in the hurricane-affected area will be stored on the OAR Web site and will be linked from the Agency's Hurricane Katrina/Rita Air Quality Data page.

Attachment 2 contains a flow diagram of the planned data management flow.

X. Sites To Be Monitored

Attachment 3 shows the multi-pollutant monitoring sites now under consideration in New Orleans and the nearby areas. These sites were tentatively selected to cover New Orleans proper and the nearby areas where debris burning is likely to be significant, to be near population, and to have suitable logistics. The full air toxics sites in New Orleans will be located at the pre-storm Kenner site and one other in-city site.

In Mississippi, eight sites are planned in the coastal area; of which two will be pre-storm monitoring sites (Gulfport and Pascagoula). A new site will be established at Stennis airport, plus five sites not yet determined and which may be moved during the monitoring program. Attachment 4 contains a map showing known site locations.

XI. Monitoring Schedule

Sampling Period

The portable real-time PM2.5/PM10 analyzers (EBAMs) in Louisiana will operate continuously, reporting mass measurements every 15 or 60 minutes. TEOM-based real-time PM2.5 samplers at state-operated sites in New Orleans and in Mississippi will operate continuously, reporting hourly data.

Sampling for asbestos, total PM, total PM metals and mercury, VOCs, and semi-volatile organic compounds using personal sampling pumps deployed in fixed-site mode will usually be for 24 hour periods, unless battery limitations dictate shorter intervals. Organic VOC badges will be deployed for 72 hour sampling periods.

Filter based PM2.5 and PM10 measurements using low flow FRM samplers will be run at 24 hour intervals, with results available after laboratory gravimetric and metals analysis.

Hazardous air pollutants at the four new full air toxics sites will be sampled at 24 hour intervals, on a daily basis.

Sampling Schedule

Tentatively, EPA is planning on every day sampling during all or part of the first 90 days, during which time the need for and frequency of sampling types requiring laboratory analysis will be re-examined. To supplement the two new full air toxics monitoring sites in Mississippi, sampling frequency at two existing air toxics sites, Pascagoula and Tupelo, will be increased from 1 in 12 days to daily and 1 in 6, respectively, for all or part of the first 90 days. The number of PM2.5 plus PM10 filter samples in any given day will not exceed 50 due to laboratory capacity constraints, and will begin well below that level due to the feasible schedule for sampler start-ups. As the number of sites increases, sampling frequency at each may be reduced to remain within this limit.

Attachment 1
Data Quality Requirements for Particulates, and Toxics Monitoring Metals Analyses

In order to ensure monitoring takes place as soon as possible and data will meet the data quality needs, EPA will use the measurement quality objectives and standard operating procedures described in two national monitoring programs: the $PM_{2.5}$ program for particulate monitoring/analyses, and the National Ambient Toxics Trend Network (NATTS) for metals analyses. It is felt that the quality requirements described for these programs are adequate for this study.

Particulate monitoring ($PM_{2.5}$, PM_{10}), for the most part, will follow the requirements defined in $PM_{2.5}$ monitoring documentation as listed in Table 1. Where changes to requirements have been made, they are identified as a "K" in the "Criteria" column. Since PM_{10} monitoring will utilize the same samplers and filters as $PM_{2.5}$, the QA requirements for PM_{10} will follow the $PM_{2.5}$ requirements. Most of the requirements for monitoring can be found in the code of federal regulations and the document entitled: *Quality Assurance Guidance Document 2.12: Monitoring PM2.5 in Ambient Air Using Designated Reference or Class I Equivalent Methods*. This document can be found on the Ambient Monitoring Technology Information Center (AMTIC) http://www.epa.gov/ttn/amtic/pmqainf.html. References for each requirement listed in Table 1 are identified in the last two columns with the exception of any changes accommodated for this study.

Once mass is determined from the PM_{10} and $PM_{2.5}$ filters, they will be analyzed for metals. The Table 1 requirements for the field monitoring aspects are applicable for the collection of metals. Table 2 lists the laboratory data quality requirements for the metals analysis which follows the requirements specified for the NATTS program.

QA Project Plans

Field Monitoring

The field activities will utilize the $PM_{2.5}$ Performance Evaluation Program (PEP) approved QAPP and standard operating procedures (SOPs) with some minor modifications. The OAQPS PEP lead will make these modifications known to field operators through a Quality Bulletin.

Laboratory Analysis

Research Triangle Institute (RTI) will be responsible for the particulate filter preparation and analyses for both mass and metals analysis. RTI has a direct contract with EPA through the $PM_{2.5}$ Speciation Trends Network (STN) for mass analyses and has an approved QAPP and standard operating procedure applicable for the PM_{10} and $PM_{2.5}$ mass determination that meets the filter preparation and laboratory analysis requirements in Table 1. Metals analyses will be contracted through Eastern Research Group (ERG) that will subcontract this work to RTI. ERG has an approved QAPP that ensures that the metals analyses will meet the requirements in Table 2.

Overall Precision and Bias

Precision will be estimated through the implementation of collocated samplers. For each monitoring area, 1 site will be collocated with a second set of PM_{10} and $PM_{2.5}$ monitors. This collocated set will provide an indication of repeatability of the monitors in that study area. The samplers will collect a set of filters every three days and will be shipped to RTI for gravimetric and metals analyses.

Bias will be performed independently through PEP which is used to estimate bias of the routine $PM_{2.5}$ network. Filters for this performance evaluation will be prepared, dispersed and analyzed by the Region 4 PEP laboratory. However, since the PEP does not analyze for metals, the PEP filters will be archived and may be sent to RTI for metals analysis.

Auditing Activities

Audits provide one with some assurance that the quality system developed for monitoring program is being followed and therefore that the monitoring program should be providing data of known and adequate quality. The audits provided for this program are briefly explained.

Field Audits

Auditing of field activities will be implemented by the EPA Regions 4 and 6 through:

- **Technical systems audits (TSAs) -** This is an on-site evaluation that the requirements in the QAPP and SOPs are being followed. Once the PM_{10} and $PM_{2.5}$ monitors are installed and operators are trained, a TSA will be conducted to ensure that the monitoring is being properly conducted. Due to the nature of the program, corrective actions will take place upon immediate identification of a major finding. If a disagreement occurs, EPA must provide a satisfactory conflict resolution within 24 hours. An audit finding report for each audit will be generated within 1 week of the audit.

- **Quarterly Independent Monitor Audits**- Flow rate, temperature and barometric pressure will be verified using an independent audit instrument by an independent auditor every three months. This audit can be implemented in conjunction with a TSA..

Laboratory Audits-

Auditing of laboratory activities will be implemented through

- **Technical systems audits**- Similar to field audits, RTI currently undergoes a technical systems audit by the Office of Radiation and Indoor Air (ORIA) for the STN program mentioned earlier. This audit will sufficiently cover the laboratory activities for this study.

- **Proficiency Test Samples-** The NATTS program conducts a quarterly proficiency test program where audit samples of known concentration (not known to the analyst) are sent to the laboratories for analysis. These audits are used to determine laboratory data acceptability and RTI will be included in the next set of PTs for the duration of the study.

Data Quality Assessments

OAQPS in cooperation with the EPA Regions will review routine, quality control and audit data on a monthly basis and provide a summary report of the following attributes:

- Data completeness of routine and QC data
- Precision and bias assessments
- General status of quality activities (audits, TSAs, etc.)

- Issues/corrective actions

QA Requirements for PM10 and PM2.5 Monitoring					
[a] S- Single Filter, G- Group of filters (i.e. batch), G1-Group of filters from 1 instrument					
Criteria	**Acceptable Range**	**Frequency**	**Samples Impacted[a]**	**40 CFR Reference**	**QA Guidance Document 2.12 Reference**
Filter Holding Times					
Sample Recovery -K	# 4 hours from sample end date/time	all filters	S	Part 50, App. L Sec 10.10	Sec. 7.11
Post-sampling Weighing	# 10 days at 25E C from sample end date, or # 30 days at 4E C from sample end date	all filters	S	Part 50, App. L Sec 8.3	Sec. 7.11
Sampling Period (including multiple power failures) - K	1320-1500 minutes, or	all filters	S	Part 50, App.L Sec 3.3 Part 50, App.L Sec 7.4.15	
Sampling Instrument					
Average Flow Rate	average within 5% of 16.67 liters/minute	every 24 hours of op	S	Part 50, App.L Sec 7.4	
Variability in Flow Rate	CV # 2%	every 24 hours of op	S	Part 50, App.L Sec 7.4.3.2	
Filter					
Visual Defect Check (unexposed)	see reference	all filters	S	Part 50, App.L Sec 10.2	Sec 7.5
Filter Conditioning Environment					
Equilibration	24 hours minimum	all filters	G	Part 50, App.L Sec 8.2	Sec. 7.6
Temp. Range	24-hr mean 20-23E C	all filters	G	Part 50, App.L Sec 8.2	Sec. 7.6
Temp.Control	" 2E C SD* over 24 hr	all filters	G	Part 50, App.L Sec 8.2	Sec. 7.6
Humidity Range	24-hr mean 30% - 40% RH or # 5% sampling RH but > 20%RH	all filters	G	Part 50, App.L Sec 8.2	Sec. 7.6
Humidity Control	" 5% SD* over 24 hr.	all filters	G	Part 50, App.L Sec 8.2	Sec. 7.6
Pre/post Sampling RH	difference in 24-hr means # " 5% RH	all filters	S/G	Part 50, App.L Sec 8.3.3	
Balance	located in filter conditioning environment	all filters	G	Part 50, App.L Sec 8.3.2	
Filter Checks					
Exposure Lot Blanks	less than 15 Fg change between weighings	3 filters per lot	G	not described	Sec. 7.7
Filter Integrity (exposed)	no visual defects	each filter	S	not described	Sec. 8.2
Filter Holding Times					
Pre-sampling	< 30 days before sampling	all filters	S	Part 50, App.L Sec 8.3	Sec. 7.9

QA Requirements for PM10 and PM2.5 Monitoring

[a] S- Single Filter, G- Group of filters (i.e. batch), G1-Group of filters from 1 instrument

Criteria	Acceptable Range	Frequency	Samples Impacted[a]	40 CFR Reference	QA Guidance Document 2.12 Reference
Lab QC Checks					
Field Filter Blank	" 30 Fg change between weighings	10% or 1 per weighing session	G/G1	Part 50, App.L Sec 8.3	Sec. 7.7
Lab Filter Blank	" 15 Fg change between weighings	10% or 1 per weighing session	G	Part 50, App.L Sec 8.3	Sec. 7.7
Balance Check	#3 Fg	beginning, 10th sample, end	G	not described	Sec. 7.9
Duplicate Filter Weighing	" 15 Fg change between weighings	1 per weighing session	G	not described	Sec 7.11
Sampling Instrument					
Individual Flow Rates	no flow rate excursions > "5% for > 5 min. [1/]	every 24 hours of op	S	Part 50, App.L Sec 7.4.3.1	
Filter Temp Sensor	no excursions of > 5E C lasting longer than 30 min [1/]	every 24 hours of op	S	Part 50, App.L Sec 7.4	
Calibration/Verification					
External Leak Check	< 80 mL/min	1/4 weeks	G1	Part 50, App.L, Sec 7.4	Sec. 6.6 & 8.4
Temperature Calibration	" 2EC of standard	if multi-point failure	G1	Part 50, App.L, Sec 9.3	Sec. 6.4
One-point Temp Check	" 4EC of standard	1/4 weeks	G1	Part 50, App.L, Sec 9.3	Sec. 6.7 & 8.4
Pressure Calibration	" 10 mm Hg	on installation, then 1/yr	G1	Part 50, App.L, Sec 9.3	Sec. 6.5
Pressure Verification	" 10 mm Hg	1/4 weeks	G1	Part 50, App.L, Sec 9.3	Sec. 6.7 & 8.2
One-point flow rate check	" 4% of transfer standard	1/4 weeks	G1	Part 50, App.L, Sec 9.2.5	Sec 8.4
Flow Rate (FR) Calibration	" 2% of transfer standard	if multi-point failure	G1	Part 50, App.L, Sec 9.2	Sec 6.3
FR Multi-point Verification	" 2% of transfer standard	1/yr	G1	Part 50, App.L, Sec 9.2	Sec 6.3 & 6.7
Design Flow Rate Adjustment	" 2% of design flow rate	at one-point or multi-point	G1	Part 50, App.L, Sec 9.2.6	6.7
Clock/timer Verification	1 min/mo	1/4 weeks	G1	Part 50, App.L, Sec 7.4	Table 3-1
Mirobalance Calibration	Manufacturer's specification	1/yr	G	Part 50, App.L, Sec 8.1	Sec 7.2
Lab Temperature	" 2EC	1/6 months	G	not described	Sec 3.3

QA Requirements for PM10 and PM2.5 Monitoring

[a] S- Single Filter, G- Group of filters (i.e. batch), G1-Group of filters from 1 instrument

Criteria	Acceptable Range	Frequency	Samples Impacted[a]	40 CFR Reference	QA Guidance Document 2.12 Reference
Lab Humidity	" 2%	1/6 months	G	not described	Sec 3.3
Precision					
Collocated Samples	CV $\leq$ 10% of samples > 6 Fg/m^3	every 3 days for 1 site per monitoring area	G	Part 58, App.A, Sec 3.5 and 5.5	Sec. 10.2
Accuracy					
Temperature Audit	" 2EC	4/yr	G1	not described	Sec. 10.2
Pressure Audit	"10 mm Hg	4/yr	G1	not described	Sec. 10.2
Balance Audit	" 0.050 mg or manufacturers specs, whichever is tighter	1/yr	G	not described	Sec. 10.2
Flow Rate Audit	" 4% of audit standard " 5% of design flow rate	1/2wk (automated) 4/yr (manual)	G1	Part 58, App A, Sec 3.5	Sec. 10.1 & 10.2
Calibration & Check Standards (working standards)					
Field Thermometer	" 0.1E C resolution, " 0.5E C accuracy	1/yr	G/G1	not described	Sec 4.2 & 6.4
Field Barometer	" 1 mm Hg resolution, " 5 mm Hg accuracy	1/yr	G/G1	not described	Sec 4.2 & 6.5
Working Mass Stds. (compare to primary standards)	0.025 mg	1/3 mo.	G	not described	Sec 4.3 and 7.3
Monitor Maintenance					
Impactor VSCC - K	cleaned/changed	every 5 sampling events every 30 sampling events	G1	not described	Sec 9.2
Inlet/downtube Cleaning	cleaned	every 15 sampling event	G1	not described	Sec 9.3
Filter Chamber Cleaning	cleaned	monthly	G1	not described	Sec 9.3
Leak Check @	see ***Calibration/Verification***				
Circulating Fan Filter Cleaning	cleaned/changed	monthly	G1	not described	Sec 9.3
Manufacturer-Recommended Maintenance	per manufacturers' SOP	per manufacturers' SOP	G1	not described	not described
Data Completeness	$\geq$ 75%	quarterly	G1	Part 50, App. N, Sec. 2.1	

QA Requirements for PM10 and PM2.5 Monitoring

[a] S- Single Filter, G- Group of filters (i.e. batch), G1-Group of filters from 1 instrument

Criteria	Acceptable Range	Frequency	Samples Impacted[a]	40 CFR Reference	QA Guidance Document 2.12 Reference
Reporting Units	Fg/m^3 at ambient temp/pressure	all filters		Part 50.3	Sec. 11.1
Detection Limit					
Lower DL	# 2 Fg/m^3	all filters	G/G1	Part 50, App.L Sec 3.1	
Upper Conc. Limit	$ 200 Fg/m^3	all filters	G/G1	Part 50, App.L Sec 3.2	
Standards Recertifications					
Flow Rate Transfer Std.	" 2% of NIST-traceable Std.	1/yr	G/G1	Part 50, App.L Sec 9.1 & 9.2	Sec. 6.3
Field Thermometer	" 0.1E C resolution, " 0.5E C accuracy	1/yr	G/G1		Sec 4.2.2
Field Barometer	" 1 mm Hg resolution, " 5 mm Hg accuracy	1/yr	G/G1		Sec 4.2.2
Primary Mass Stds. (compare to NIST-traceable standards)	0.025 mg	1/yr	G		Sec 4.3.7
Microbalance					
Readability	1 Fg	at purchase	G	Part 50, App.L Sec 8.1	Sec 4.3.6
Repeatability	1Fg	1/yr	G	not described	Sec 4.3.6
Bias					
FRM Performance Evaluation Program - K	"10%	15% of sites 4/yr	G/G1	Part 58, App A, Sec 3.5	Sec 10.2

1/ value must be flagged`
***= variability estimate not defined in CFR**
@= Scheduled to occur immediately after impactor cleaned/changed.
CV= coefficient of variation

Measurement Quality Objections for Hazardous Air Pollutants at Full Air Toxics Sites

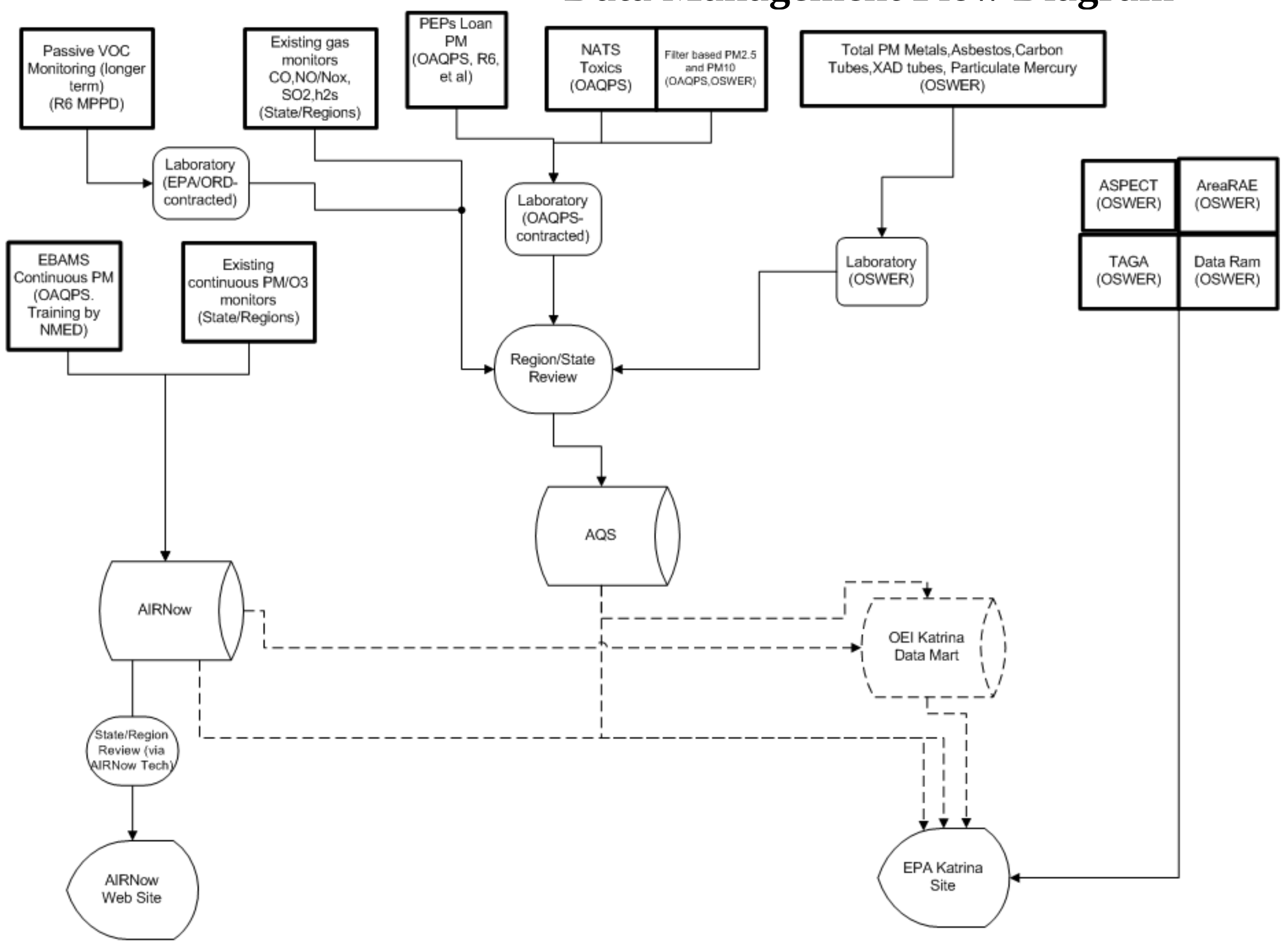
Program	Reporting Units	Accuracy Using Replicate Samples	Precision (CV) From collection Of Duplicate Samples	Representatives	Comparability/ Method Selection	Completeness	Minimum Detection Limits
SNMOC	Ppbv	30%	± 30%	Neighborhood	GC-FID EPA Compendium Method TO-15	>85%	See Table 11-3 of ERG contract QAPP
Carbonyls	Ppbv	10%	± 20%	Neighborhood	HPLC EPA Compendium Method TO-11A	>85%	See Table 11-5 of ERG contract QAPP
Semivolatile	Total ug/m3 For XAD Thimbles, ng/m3 for PUF	30%	±30%	Neighborhood	GC/MS EPA Compendium Method TO-13A & SW-846 Method 8270C	>85%	See Tables 11-6 and 11-7 of ERG contract QAPP
Metals	ng/filter	20%	±20%	Neighborhood	ICP-MS EPA Compendium Method 10-3.5	>85%	Research Triangle Institute (RTI) QAPP (See Appendix D) and Section 11
Hexavalent Chromium	ng/Filter	10%	± 30%	Neighborhood	IC-UV Detector CARB Method MLD 039	>85%	0.12 ng/L

Summary of Quality Control Procedures for Metals Analysis (Method 10-3[29]) And Hexavalent Chromium (CARB 039[30])

Parameter	Frequency	Acceptance Criteria	Corrective Action
Multipoint calibration standards	Daily	Correlation coefficient ≥ 0.995	1) Repeat analysis of callibration standards. 2) Reprepare calibration standards and reanalyze.
Calibration check standard	Daily	Recovery 90-110%	1) Repeat analysis of calibration check standard. 2) Repeat analysis of calibration standards. 3) Reprepare calibration standards and reanalyze.
Continuing calibration verification standard	Every 10 samples	Recovery 90-110%	1) Repeat analysis of continuing calibration Verification sample 2) Reprepare continuing calibration. 3) Reanalyze samples since last acceptable Continuing calibration verification.
Duplicate and/or replicate analysis	On all duplicate samples/one every 10 samples	Relative standard deviation of ± 15-20% for all samples above 5 times MDL	1) Repeat analysis. 2) Flag data.
Method blanks	Every 10 samples	Analytes below MDL	1) Reanalyze. 2) Reprepare blank and reanalyze. 3) Correct contamination and reanalyze blank. 4) Repeat analyses of all samples since last clean clean blank.
LCS	One sample per batch	Recovery 90-110%	1) Reprepare sample batch. 2) Reanalyze.

29, 30 – Footnotes refer to footnotes in the ERG contract QAPP.

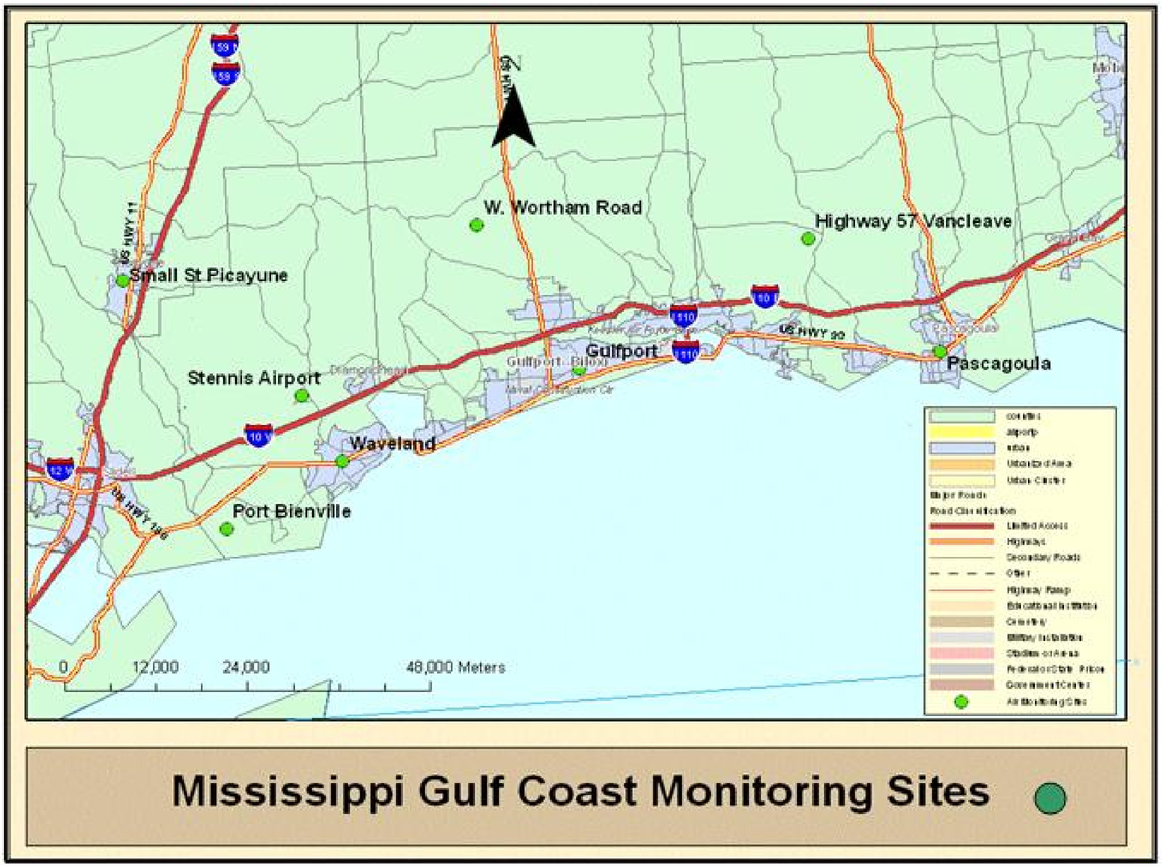
Attachment 2
Data Management Flow Diagram



Proposed Katrina Air Data Flow Revised 09/29/2005

Attachment 3
Tentative Monitoring Sites in New Orleans
(Triangles indicate pre-storm sites; yellow circles indicate tentative sites for post-Katrina monitoring)

Attachment 4
Monitoring Sites in Coastal Mississippi
(Green circles represent pre-storm sites. Stennis site will be relocated.)



Attachment 5

Katrina Air Monitoring Schedule/Tracking Sheet - Louisiana
Best Information/Estimates as of: September 29, 2005

	Rapid Screening Data	Real Time Definitive Data on Ambient Air Quality	Time-Delayed Data
Description	**ASPECT airplane (and a similar DOE airplane) -** Remote sensing of chemical spills to guide emergency response work. Provides rough indicator of local concentrations of organic gases (benzene, etc.). **TAGA** – 2 mobile labs measuring organic gases, primarily to guide emergency response efforts. Concentration data for organic gases is high quality, but periods are short. TAGA measures VOC with several methods include real time GC, canisters and tedlar bags. OSWER – ERT- Duane Newell, Phil Campagna. **DataRAM -** About 7 hand-held nephelometer units provide rough estimate of inhalable PM. OSWER - ERT - Phil Compagna. **AreaRAE** – Handheld units measure a limited set of organic gases. Low precision. [Name of best contact?] **DOE Aircraft (GooneyBird?) –** Remote sensing of airborne and ground/water based pollutants? (Documentation on anhydrous ammonia plumes on FTP site: ftp://GooneyBird:DC_3HH!@216.81.41.189/)	**EBAMs** – Portable units with satellite data upload. Includes wind speed, direction. Will be mostly be used in pairs to measure both hourly PM10 and PM2.5. OAQPS – Jim Homolya & Nealson Watkins Region 6 – Becky Weber/Donna Ascenzi/Jim Ahfgani OSWER – Duane Newell, Phil Campagna **Fixed-site Continuous PM** – Standard state-operated monitors for hourly PM2.5 are being restored at pre-storm sites. Jennifer Mouton - LDEQ **Fixed-site NAAQS Gas Monitors** – Standard state-operated monitors for O3, SO2, CO, and NOx/NO (and H2s?) are being restored at pre-storm sites. Jennifer Mouton - LDEQ	**Passive VOC badges –** Organic gases absorb onto badges carried worn by people or placed for 24 or 48 hours at a location of interest. Lab later analyzes badge for several air toxics of interest. Low precision. R6 operation only – Becky Weber, Donna Ascenzi **Summa VOC canisters –** Evacuated canisters are filled with ambient air at a site of interest. Lab later analyzes canister contents for a panel of toxic hydrocarbons. High precision. LDEQ operation only - Jennifer Mouton. **Carbon Tubes** – Tubes of absorbent carbon are loaded using a personal monitoring pump. Lab later analyzes for toxic gases. OSWER-ERT operation only - Phil Campagna) **PM filters –** Sampler draws ambient air through a filter, usually for 24 hours. Will usually be deployed in pairs to monitor for PM2.5 and PM10 simultaneously. Some samplers are battery operated and can be deployed before power is restored. Lab later analyzes filters for mass concentration and toxic metals including lead. High precision. OAQPS – Nealson Watkins & Dennis Crumpler R6 – Becky Weber, Donna Ascenzi OSWER – ERT – Duane Newll, Phil Campagna

	Rapid Screening Data	Real Time Definitive Data on Ambient Air Quality	Time-Delayed Data
			Full Air Toxics Stations - Several different samplers and media are used to collect gases, semi-volatile organics, and PM10. Lab later analyzes for full suite of air toxics including chemicals not measurable with Summa canisters. High precision. OAQPS- Mike Jones **Asbestos** – Can be collected on filters and analyzed in lab. OSWER – Phil Campagna. R6 – Becky Weber, Donna Ascenzi OAQPS – Deirdre Murphy
Why Collected, Risk Addressed	**ASPECT, TAGA, and AreaRAE** are primarily used for emergency response management: find spills, identify spilled material, tell whether it is safe to approach, etc. Also has provided the earliest indication of general air quality for toxics gases in areas of interest. **DataRAMs** have provided first indication of PM in areas with road activity, as can occur from resuspended flood deposits.	**Continuous PM** data can provide information on pollution from resuspended sediment or other dust-generating activity such as debris handling, and from open burning. No chemical analysis. **Fixed-site Continuous Gas Monitors -** Ozone data presently has little Katrina-related use. Other gases are useful for monitoring for possible problems caused by industry re-starts, etc.	**Passive VOC badges –**Air toxics from spills, spill-contaminated flood waters, and open burning. Personal exposures and ambient concentrations in areas where other monitoring for toxic gases is not possible. Low precision. **Carbon tubes** - Air toxics from spills, spill-contaminated flood waters, and open burning. Personal exposures and ambient concentrations in areas where other monitoring for toxic gases is not possible. Medium to low precision. **Summa VOC canisters** – Air toxics from spills, spill-contaminated flood waters, and open burning. More complete panel of toxic gases. High precision. **PM filters** – Mass concentration data can provide information on pollution from resuspended sediment or other dust-generating activity such as debris handling, and from open burning. Lab quantifies toxic metals. High precision. **Full Air Toxics** – Information on most air toxics risks from dust, open burning, mobile sources and any other significant sources

	Rapid Screening Data	Real Time Definitive Data on Ambient Air Quality	Time-Delayed Data
			affecting a location. Including aldehydes, PAHs, and other chemicals not otherwise measured, but does not include asbestos, dioxin/furans, or PCB. High precision. **Asbestos** – Asbestos may be released by demolition, debris handling, and/or burning. Data may guide these actions and inform public.
Sampling and Data Process; Cycle Time; Lab; Data management leadership	Real time display of concentrations to operators/responders. Typically planned on day 1, collected on day 2, and summarized overnight for air quality assessment and presentation to EPA managers on day 3. Data also entered into SCRIBE, etc. Data managed by OEM/ERT.	**Continuous PM or Gas measurements:** Hourly averages are automatically loaded into AIRNOW and are available on the internet within a hour or two. Limited access allowed for data review. Password protected unless full public access is granted.	**Generally** - Samples from several days of sampling may be bunched for efficient analysis. Delay needed between analysis and public posting to allow data transfer and state review of data **Passive VOC badges** – Lab analysis contract dependent. Region 6 is investigating. **Carbon Tubes** – Dependent upon OSWER – ERT contractor agreement. **Summa VOC** – Dependent upon LDEQ contractor agreement. **PM filters** – – Sampling, return shipping, lab analysis, and posting to AQS for agency review typically take about 10 days for mass concentration, 17 days for toxic metals. Agency controls start of public access. PM filters for battery-powered units will be analyzed by RTI for mass and toxic metals under OAQPS contract. **Full air toxics** - Sampling, shipping, lab analysis, and posting to AQS for agency review typically take about 17 days for all data. Agency controls start of public access. All samples analyzed by ERG under OAQPS contract. **Asbestos –** Sampling, shipping, and

	Rapid Screening Data	Real Time Definitive Data on Ambient Air Quality	Time-Delayed Data
			analysis by ERT or other lab typically takes 5 to 7 days. **Data management leadership** depends on office supervising the lab, unless otherwise arranged. Badges – Region 6 MPPD Carbon Tubes – OSWER - ERT Summa canisters –LDEQ PM filters –OAQPS Full Air Toxics – OAQPS Asbestos –OSWER - ERT
Siting	Determined by on-site team daily. OSWER – ERT - Phil Campagna.	**EBAMs --** 7 units available to site. Site locations are under review. **Continuous PM** – Kenner site operational with PM2.5 TEOM unit.	**Passive badges** – EPA – R6 will site as needed to provide ambient exposure data. Site locations are under review. **Carbon Tubes** – OSWER – ERT will site as needed to provide ambient exposure data. Site locations are under review. **Summa canisters -** LDEQ site and sample based on public complaint only. **Battery powered PM samplers** – Site locations are under review. Equipment available for 7 co-located PM10 & PM2.5 sites by 9/29. **AC- powered PM samplers** - Site locations are under review. **Full Air Toxics** – Two sites planned. Potentially Kenner site and one to be determined. **Asbestos** – Site locations are under review. To be collocated with PM samplers.
Number	Determined by on-site team daily. OSWER – ERT - Phil Campagna.	**EBAMs** – 7 loaned units on location in Baton Rouge. 4 new units to be purchased. 3 units identified for loans if needed.	**Passive badges** – number to be deployed will be determined each week **Carbon Tubes** – Unknown (OSWER –

	Rapid Screening Data	Real Time Definitive Data on Ambient Air Quality	Time-Delayed Data
			ERT) **Summa Canisters** – Unknown (LDEQ info.) **Battery powered PM samplers** – 14 BGI PQ200s. 7 for PM.25, 7 for PM10. **AC- powered PM samplers** – OSWER – ERT making up to 35 Hi-Vol PM10 units available. **Full Air Toxics -** 2 sites. **Asbestos** – Number to be determined
Current Status/Recent Events	Operations dictated by on-site team daily. OSWER – ERT - Phil Campagna.	**EBAM** – 7 units in Baton Rouge as of 9/26. State of New Mexico staff and R6 staff will provide training to OSWER staff and/or contractors possibly by 9/29/ **Continuous PM -** Kenner site is operational.	**Badges** are in Baton Rouge. Lab contract is being processed. **Battery powered PM samplers** - Six samplers enroute from Houston on 9/27. Three units enroute from OAQPS. Two units enroute from ORIA – Las Vegas. Three additional units enroute from EPA regions 7, 8, and 9. **AC- powered PM samplers** - PM10 samplers received, more on the way. PM2.5 samplers selected, need to be procured. **Full air toxics** - Detail plans for equipment and lab services complete. Deployment and start-up dependent on OAQPS contract funding. Site selection may also delay deployment. **Asbestos** – OSWER – ERT has lab services secured. Deployment and operations dependent upon site selection and ERT resources.

	Rapid Screening Data	Real Time Definitive Data on Ambient Air Quality	Time-Delayed Data
			Fixed-site NAAQS Gas Monitors – Kenner site is reporting hourly CO, SO2, NO/NOx/NO2, H2S, and PM2.5, with several days delay.
ETA for equipment arrival to Gulf Coast site(s)	On Site Now	**EBAMs** – Units in Baton Rouge as of 9/26.	**Badges** – 10/13/2005 **Battery powered PM samplers** - 14 BGI PQ200 units in Baton Rouge by 9/29. **AC-powered PM samplers** – Many PM10 samples there now. No ETA yet for additional PM2.5 samplers (ERT will purchase). **Full Air Toxics** - Dependent upon contract funding. Deployment and training will take one week after contract is funded
1st sampling period start	Ongoing	**EBAMs** - Dependent upon training, site selection, and susequent deployment. **Continuous PM** – Ongoing from Kenner site.	**Badges** – Upon site selection and deployment. **PM samplers** - Upon site selection and deployment. **Full Air Toxics** - Dependent upon contract

	Rapid Screening Data	Real Time Definitive Data on Ambient Air Quality	Time-Delayed Data
			funding and suitable site selection. Deployment and training will take one week after contract is funded
ETA 1st sample at lab	Not applicable or integrated.	Not Applicable	**Badges** - Dependent upon site selection and deployment. Sample at lab typically 2 days after collection. (EndOfSample + 2 Days) **PM samplers** – Dependent upon site selection and deployment. Sample at lab typically 2 days after collection. (EndOfSample + 2 Days) **Full Air Toxics** - Dependent upon contract funding. Deployment and training will take one week after contract is funded. Sample at lab typically 2 days after collection. (EndOfSample + 2 Days) **Asbestos -** Dependent upon site selection and deployment. Sample at lab typically 2 days after collection. (EndOfSample + 2 Days)
Data available for QA review by lead EPA office (spreadsheet or similar format)	Ongoing, end of each day	**EBAMs** - QA review is automatic. Data can be password protected if EPA wants to be first to see and develop any needed message. **Continuous PM** - Data goes through some QA during submission and posting to AIRNow.	**Badges** – Unknown. Dependent upon R6 lab contract data delivery requirements. **PM samplers** – Unknown, see below **Full Air Toxics** – Unknown, see below **Asbestos** – Typically 24 hours (per OSWER) (EndOfSample + 3 Days)
ETA for data to be on SCRIBE, AQS or AIRNOW for broader EPA/state	???	**EBAMs** – Immediately upon start-up and submission to AIRSYS and then AIRNow.	**Badges** - Unknown. Dependent upon R6 lab contract data delivery requirements.

	Rapid Screening Data	Real Time Definitive Data on Ambient Air Quality	Time-Delayed Data
review		**Continuous PM -** Immediately upon start-up and submission to AIRNow.	**PM samplers -** Typically 10 days after sample collection for PM mass. Typically 17 days after sample collection for PM metals. (EndOfSample + 10 Days for mass) (EndOfSample + 17 Days for metals) **Full Air Toxics -** Typically 17 days after sample collection. (EndOfSample + 17 Days) **Asbestos –** Typically 5 to 7 days after sample collection. (EndOfSample + 7 Days)
ETA for public data	???	As soon as EPA chooses.	**Badges** – Upon EPA approval. **PM samplers** – Dependent upon time taken for stakeholder reviews. **Full Air Toxics** - Dependent upon time taken for stakeholder reviews. **Asbestos –** Dependent upon time taken for stakeholder reviews.

Attachment 6

Katrina Air Monitoring Schedule/Tracking Sheet – Region 4 - Mississippi
Best Information/Estimates as of: September 29, 2005

	Rapid Screening Data	Real Time Definitive Data on Ambient Air Quality	Time-Delayed Data
Description	NONE	**Fixed-site Continuous PM** – Standard state-operated monitors for hourly PM2.5 are being restored at 2 pre-storm sites, and one new/relocated site. R4- Danny France & Richard Guillot **Fixed-site NAAQS Gas Monitors** – Standard state-operated monitors for O3 are being restored at pre-storm sites. R4 – Danny France & Richard Guillot **EBAMs** – Portable units with satellite data upload. Includes wind speed, direction. Will be mostly be used in pairs to measure both hourly PM10 and PM2.5. OAQPS – Jim Homolya & Nealson Watkins Region 4 – Danny France & Richard Guillot	**PM samplers –** Sampler draws ambient air through a filter, usually for 24 hours. Will usually be deployed in pairs to monitor for PM2.5 and PM10 simultaneously. Some samplers are battery operated and can be deployed before power is restored. Lab later analyzes filters for mass concentration and toxic metals including lead. High precision. OAQPS – Nealson Watkins & Dennis Crumpler R4 – Danny France, Richard Guillot, Greg Noah **Full Air Toxics Stations** - Several different samplers and media are used to collect gases, semi-volatile organics, and PM10. Lab later analyzes for full suite of air toxics including chemicals not measurable with Summa canisters. High precision. OAQPS- Mike Jones R4 – Danny France & Richard Guillot **Asbestos** – Can be collected on filters and analyzed in lab. R4 – Danny France & Richard Guillot OAQPS - Deirdre Murphy

	Rapid Screening Data	Real Time Definitive Data on Ambient Air Quality	Time-Delayed Data
Why Collected, Risk Addressed	NONE.	**Continuous PM** data can provide information on pollution from resuspended sediment or other dust-generating activity such as debris handling, and from open burning. No chemical analysis. **Fixed-site Continuous Gas Monitors -** Ozone data presently has little Katrina-related use. Other gases are useful for monitoring for possible problems caused by industry re-starts, etc.	**PM samplers** – Mass concentration data can provide information on pollution from resuspended sediment or other dust-generating activity such as debris handling, and from open burning. Lab quantifies toxic metals. High precision. **Full Air Toxics** – Information on most air toxics risks from dust, open burning, mobile sources and any other significant sources affecting a location. Including aldehydes, PAHs, and other chemicals not otherwise measured, but does not include asbestos, dioxin/furans, or PCB. High precision. **Asbestos** – Asbestos may be released by demolition, debris handling, and/or burning. Data may guide these actions and inform public.
Sampling and Data Process; Cycle Time; Lab; Data management leadership	NONE.	**Continuous PM or Gas measurements:** Hourly averages are automatically loaded into AIRNOW and are available on the internet within a hour or two. Limited access allowed for data review. Password protected unless full public access is granted. Data managed by OAR.	**Generally** - Samples from several days of sampling may be bunched for efficient analysis. Delay needed between analysis and public posting to allow data transfer and state review of data. R4 is data management lead until states re-engage. **PM samplers** – Sampling, return shipping, lab analysis, and posting to AQS for agency review typically take about 10 days for mass concentration, 17 days for toxic metals. Agency controls start of public access. PM filters for battery-powered units will be analyzed by RTI for mass and toxic metals under OAQPS contract. R4/OAQPS data management leads.

	Rapid Screening Data	Real Time Definitive Data on Ambient Air Quality	Time-Delayed Data
			Full air toxics – Sampling, shipping, lab analysis, and posting to AQS for agency review typically take about 17 days for all data. Agency controls start of public access. All samples analyzed by ERG under OAQPS contract. OAQPS & R4 data management leads. **Asbestos –** Sampling, shipping, and analysis by ERT or other lab typically takes 5 to 7 days. If ERT contract is used, data will be handled by OSWER – ERT. If OAR or Region 4 uses contracts, data will move through AQS. R4 will have the lead on data review and management.
Siting	NONE.	**Continuous PM** sites will be at pre-Katrina state air monitoring sites. Gulfport site operational with continuous PM2.5 (TEOM unit). Two TEOM sites to be set up by the state at Pascagoula and the Stennis site. **EBAMs –** Potentially for use at burn sites. Number and locations to be determined.	**PM samplers** – 3 fixed sites selected with potentially 5 more sites. 3 selected sites are in Pascagoula, Gulfport, and on NASA – Stennis / Stennis AFB property. **Full air toxics -** NATTS sites. Two new sites selected: Gulfport, and on NASA – Stennis / Stennis AFB property. Two pre-Katrina sites to sample more frequently: Pascagoula and Tupelo. **Asbestos -** – 3 fixed sites selected with potentially 5 more sites. 3 selected sites are in Pascagoula, Gulfport, and on NASA – Stennis / Stennis AFB property. These samplers will be collocated with any PM filter sampler sites.
Number	NONE.	**Continuous PM** – Gulfport site operational with PM2.5 TEOM unit. Potentially one more TEOM site to be set up by the state at Pascagoula.	**PM samplers** – 11 BGI PQ200 battery powered units available. **Full Air Toxics** – Gulfport and Stennis sites awaiting ERG contract for equipment. Pascagoula and Tupelo already equipped.

	Rapid Screening Data	Real Time Definitive Data on Ambient Air Quality	Time-Delayed Data
			Asbestos – At least 8 units available.
Current Status/Recent Events	NONE.	**Continuous PM** – Gulfport and Pascagoula sites operational with PM2.5 TEOM units.	**PM samplers** - Detailed plans for equipment and lab services complete. Region 4 re-deploying equipment to Mississippi 9/27 – 9/29. Operations dependent on lab contract funding. **Full air toxics** - Detail plans for equipment and lab services complete. Deployment and start-up dependent on OAQPS contract funding. **Asbestos** – Detailed plans for equipment and lab services un-settled. Lab analysis method will be modified AHERA. Contract vehicle for R4 samples is undefined.
ETA for equipment arrival to Gulf Coast site(s)	NONE.	**Continuous PM –** Dependent upon state deployment. **EBAMs** – Dependent upon request for equipment from R4.	**PM samplers** - At least 3 sites deployed 9/27 – 9/29. Remaining site deployment dependent upon site selection. **Full Air Toxics** – Dependent upon contract funding. Deployment and training will take one week after contract is funded. **Asbestos** - At least 3 sites deployed 9/27 – 9/29. Remaining site deployment dependent upon site selection.
1st sampling period start	NONE.	**Continuous PM** – Gulfport site operational with PM2.5 TEOM unit. Pascagoula site dependendent on state actions; potentially operational by 10/5. .	**PM samplers** – Projected start up of 3 sites on 10/3. **Full Air Toxics** - Dependent upon contract funding. Deployment and training will take one week after contract is funded. **Asbestos** - Projected start up of 3 sites on 10/3.

	Rapid Screening Data	Real Time Definitive Data on Ambient Air Quality	Time-Delayed Data
ETA 1st sample at lab	NONE.	Not Applicable	**PM samplers** – Dependent upon site selection and deployment. Sample at lab typically 2 days after collection. Potentially 10/5. **Full Air Toxics** - Dependent upon contract funding. Deployment and training will take one week after contract is funded. Sample at lab typically 2 days after collection. **Asbestos** - Dependent upon site selection and deployment, and establishment of lab contract. Sample at lab typically 2 days after collection.
Data available for QA review by lead EPA office (spreadsheet or similar format)	NONE.	**Continuous PM –** Immediately, as data goes through some QA during submission and posting to AIRNow. **EBAMs** - QA review is automatic. Data can be password protected if EPA wants to be first to see and develop any needed message.	**PM samplers** – Unknown, see below **Full Air Toxics** – Unknown, see below **Asbestos** – Typically 24 hours (per OSWER) (EndOfSample + 3 Days)
ETA for data to be on SCRIBE, AQS or AIRNOW for broader EPA/state review	N/A.	**Continuous PM –** Immediately upon start-up and submission to AIRNow. **EBAMs** – Immediately upon start-up and submission to AIRSYS and then AIRNow.	**PM samplers** - Typically 10 days after sample collection for PM mass. Typically 17 days after sample collection for PM metals. (EndOfSample + 10 Days for mass) (EndOfSample + 17 Days for metals) **Full Air Toxics** - Typically 17 days after sample collection. (EndOfSample + 17 Days) **Asbestos –** Typically 5 to 7 days after sample collection. (EndOfSample + 7 Days)
ETA for public	NONE.	As soon as EPA chooses.	**PM samplers** – Dependent upon time taken

	Rapid Screening Data	Real Time Definitive Data on Ambient Air Quality	Time-Delayed Data
data			for stakeholder reviews. **Full Air Toxics -** Dependent upon time taken for stakeholder reviews. **Asbestos –** Dependent upon time taken for stakeholder reviews.