

National Atmospheric Deposition Program Special Meeting
On the Mercury Deposition Network Atmospheric Initiative (MDN-AI)

Record of Discussion Forum on April 9, 2007

The following record summarizes the comments and context of discussion, generally in the order that it proceeded. When appropriate, similar comments have been combined.

- Approximately 35 participants were present. A show of hands indicated about 25 participants had experience with operating the Tekran automated system for sampling and analysis of atmospheric mercury species, and 3 participants had used the manual sampling system.
- The monitoring objectives of the new network will affect the siting criteria. The new network should be tethered to existing networks and should include locations in high elevations, near oceans and large fresh water lakes, and urban areas. Siting criteria will be one of the most difficult aspects of planning a large-scale, long-term version of the MDN-AI.
- Siting criteria need not be prescriptive to be functional. It can be descriptive of the locations where monitoring is occurring. However, it can be helpful for directing new resources to locations of greatest scientific interest for estimating effects of atmospheric mercury deposition.
- Consider including monitoring stations and locations in the new network aimed at source apportionment through event based wet deposition monitoring of mercury and trace metals, along with other air pollutants.
- The D in NADP is deposition, so the new network needs to have capacity to develop information about mercury dry deposition from the measurements of atmospheric mercury concentrations.
- Resources will be limited for the new network. Automated sampling and analysis systems are expensive and will be fewer in number, creating a low density network with the current funding that is available. There is a need for broader spatial resolution too. One approach includes a core set of stations providing intense measurement frequency of many parameters, combined with a broader coverage of stations with lower measurement frequency of fewer parameters.
- It was noted that the manual system was an effective tool for reconnaissance and scoping of locations for monitoring stations. The measurement frequency with the manual system is less than the automated system. There is interest in trying to extend the utility of the manual system for monitoring longer time periods—for use in the new network.
- Ecological and biological considerations are important for siting monitoring stations. This is different than the intended regional coverage of another NADP network like NTN.
- Concern was expressed about the availability of funding for the new network in the long term. It was stated that funding has been provided to support the planning and development of standard procedures, quality assurance, and data management. It is planned that a successful operational framework for a long-term network will be proven through the transition network and that when funding is available—it will be directed toward this new network. Currently, there are many federal agencies partnered in NADP and supporting the MDN. Similar support could be expected in a small way for the new network. Prospective funding for a national mercury monitoring network could include the MDN-AI. It is likely that no single entity will fund the MDN-AI.
- In a voluntary collaboration setup that the transition network will use, flexibility is needed to accommodate special purpose study sites.
- It was questioned whether use of data from the MDN-AI for mercury transport and deposition models was a new role for NADP. Trying to show the use of the data as a surrogate for mercury deposition will be similar to the use of the MDN data. However, it was noted that model validation is essential for current policy decisions, suggesting that the MDN-AI data will have an immediate use.
- It was commented that mercury deposition alone does not cause ecological damage such as unsafe levels in fish. Hopefully, researchers will use the MDN-AI data to tie the mercury in the air to mercury in the water and the fish. Unfortunately, traditional Federal programs have not linked funding for water and air programs.
- The method for displaying mercury dry deposition may be different from mercury wet deposition. Some wondered whether it could be shown on a map. It was stated that an inferential model using meteorological data could be applied to the atmospheric mercury species measurements to estimate a

dry deposition rate. Also, direct flux measurements are possible that can be used to compute a dry deposition rate. In either case, the estimates would represent a fairly localized condition. There is a need for better consensus on how mercury dry deposition information will be presented and used.

- It will be helpful if meteorological data are collected at every MDN-AI site so that estimates of mercury dry deposition can be supported, whether through existing models or through better models to be developed in the future. Ultimately, either modelers or the NADP will want to show dry deposition rates with data from the MDN-AI.
- Regarding the discussion of dry deposition, it is most correct to say that the MDN-AI in the transition network will be monitoring ambient concentrations, not dry deposition. Thus, it is not a dry deposition network and the correct language is important.
- Identification of trends in atmospheric mercury species concentrations is a useful objective, but could be made difficult by the nature of the data. It is probable that data from many stations will indicate a sort of background condition interspersed with plumes of higher concentrations.
- Data validation and quality assurance is very important, but is time consuming. Much effort is being exerted by investigators at individual sites to create good data. When data from various sites are combined, there could be extraneous effects on data quality by different approaches used by different investigators. Thus, it is important for data validation and QA to be documented and standardized.
- Some funding in the EPA Clean Air Markets and Air Quality Planning and Standards has been directed to support the MDN-AI network startup. Current resources will not support many new locations or a large network of automated systems. The interest is in a network of opportunity based on coordinating existing monitoring in strategic locations.
- There still is a real need for a simpler, cheaper, effective system of monitoring atmospheric mercury species and mercury dry deposition. The research for such a system should be supported. A better monitoring system would be more widely accepted, understood, and used, especially for an NADP network.
- Even if the transition network is small, it can provide some important centralized assistance for the individual monitoring operations. Services such as quality assurance, a depot for spare parts, data management and validation, and technical assistance will be improved for each station if they are part of a network.

Record of the Discussion Accompanying Presentations on April 10, 2007

Please see the meeting agenda and the archived Powerpoint presentations for more details.

- The process for developing standard procedures may appear democratic because a wide array of input has been solicited to have good information as a basis. The procedures will help combine the experience of many operators who have faced and fixed similar issues and problems.
- Technical support for troubleshooting and repair is not always easy to obtain from the equipment manufacturer. One approach might be for NADP to host a help center on line with contact information for other operators and a place to post tips and questions. The MDN-AI may be a way to get the equipment manufacturer more involved in troubleshooting, repairs, and spare parts.
- Equipment down time and data completeness are two issues to be quantified for the network. A reasonable target of data completeness should be based on the experiences of the operators with equipment down time. There are ways to operate a monitoring station to reduce the data gaps inherent in the way the equipment works or gaps caused by failures and repairs, but it costs more to do so.
- The automated Tekran system can be operated only with significant resources and highly trained staff. Data quality could be improved by making the instrumentation easier to operate and maintain. A national network needs: detailed and documented field SOP and QA plan; near real-time data review, interpretation, and validation; performance based denuder and glassware preparation; and QA audit site visits. Methods for automated data validation are needed for a new network.
- Many of the participants at the meeting are willing to participate in the MDN-AI network. They see advantages to combining knowledge and experience from their separate projects. They hope to share mutual benefits of funding, technical support, data sharing, cost estimates, spare parts, and training.