10/17 final

FINAL AGENDA
Joint Subcommittee and Network Operations Subcommittee Meetings
Monday October 20, 2003
NADP 2003 Fall Meeting, Washington D.C.

Joint Subcommittee session: MAP ROOM

10:30-10:40	Introduction of attendees and ground rules	Mark Nilles, Bob Larson John Sherwell
10:40-11:00	HAL audit summary	Chris Lehmann
11:00-11:15	HAL response	Bob Brunette
11:15-11:20	Belfort-Ott comparison report and Fact sheet	Mark Nilles
11:20-11:40	NADP Quality management plan	Chris Lehmann
11:40-11:50	Siting committee progress report	Chris Lehmann
11:50-12:00	CAMD-EPA roles in CASTNet	Mike Kolian
12:00-1:30	*Lunch (on your own)*	

NOS Subcommittee session

1:30-1:40	WA sample type protocol change-NTN	Chris Lehmann
1:40-2:05	CAL analytical method change	Karen Harlin
2:05-2:15	4 in1 mailing protocol test	Karen Harlin
2:15-2:30	NADP site visitation program	Tom Jones and John Shimshock
2:30-2:40	MDN Rain gage data review	Bob Brunette
2:40-2:50	HAL-MDN Equipment depot	Kirsi Longley
2:50-3:00	N-CON version II MDN prototype	Mark Nilles
3:00-3:15	Break	
3:15-3:50	CRN, new gage and collector testing, NED	Scott Dossett and Van Bowersox

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3:50-4:00	NTN Collector dimensions committee report	Scott Dossett
4:00-4:20	USGS External QA - What's new?	Greg Wetherbee
4:20-4:30	Network QA report	Chris Lehmann
4:30-4:45	Election of 2004 NOS Secretary	Mark Nilles
4:45-5:00	Spring 2004 meeting update	Natalie Latysh
5:00	Adjourn	

Fall 2003 Joint Session Attendees

Participation List

NAME	Agency/Assoc'n/Etc.	Phone
Jack Beach	n-con system	800-932-6266
Martha Beach	n-con system	800-932-6266
Bob Brunette	HAL	206-622-6960
Richard Cline	USDA Forest Service	703-605-5283
Scott Dossett	ISWS/NADP	217-244-0372
Scott Faller	USEPA	202-343-9180
Cari Furiness	NCSU	919-515-4653
David Gay	ISWS/AES	217-244-0462
Karen Harlin	ISWS/CAL	217-244-6413
Bob Larson	ISWS/NADP	217-333-9008
Natalie Latysh	USGS	303-236-1874
Gary Lear	USEPA	202-343-9159
Kirsi Longley	HAL	206-622-6960
Jim Lynch	PSU	814-865-8830
Dave MacTavish	Environment Canada	416-739-4450
Nicholas McMillan	HAL	206-622-6960
Mark Mesarch	Univ. of NE-Lincoln	402-472-5904
Ralph Perron	USDA Forest Service	603-726-8902
Bruce Roger	Wisconsin DNR	608-253-4506
Chris Rogers	MACTEC	904-242-8852
Kaye Surratt	ISWS/CAL	217-244-6791
Gerard Van der Jagt	HAL	206-622-6960

2003 Review of the Mercury Analytical Laboratory (HAL)

Seattle, WA: June 10 – 12

Mark Peden, Brooke Connor, Steve Lindberg, James Lynch, Chris Rogers, and Chris Lehmann

NADP Technical Committee Meeting
October 2003

NADP Laboratory Reviews

- Refer to QMP Section 6.2.3
- NADP analytical laboratories reviewed (audited) once every three years (CAL 2002 & HAL 2003)
- Written review report delivered to P.O.; laboratory submits written review response for NOS & DMAS approval
- Follow-up internal review one year after external review

Review Team

- Team Leader
  - Mark Peden (retired)
- Laboratory Review, Site Support & Operations
  - Brooke Connor (USGS)
  - Steve Lindberg (Oak Ridge NL)
- Data Management Review
  - Chris Rogers (Harding ESE)
  - Jim Lynch (Penn State)
- Observer/Program Office
  - Chris Lehmann (ISWS/NADP)

Scope of Review

- Determine whether analytical, site support and operations, and data management procedures comply with:
  - Quality Assurance (QA) plans
  - Standard Operating Procedures (SOPs)
- The Team used the following documents as the primary basis for the review:
  - MDN QA Plan
  - HAL Statement of Work
  - HAL Laboratory SOPs
  - MDN Site Operation Instruction Manual
  - 2000 HAL Review/Response Report

Updates from 2000 Review

- Material Safety Data Sheets (MSDS) readily available on-line to all staff
- Chemical Hygiene Plan updated in March 2001
- Methyl Mercury data routinely being reported to the Program Office
- Additional HAL staff identified as site liaison personnel
- A HAL “800” number initiated to make site communications easier
- Microsoft Outlook’s journal feature used to enhance logging of site communications

Unresolved Issues from 2000 Review

- Recommend MDN sample archive program be developed and implemented as soon as feasible in coordination with the Program Office and the Network Operations Subcommittee (NOS)
- Recommend HAL develop a laboratory QA plan in cooperation with the NADP QA Manager and the NADP Quality Assurance Advisory Group
- Team encouraged that an external blind audit program, administered by the USGS, is planned

Unresolved Issues from 2000 Review

- Recommend NADP QA Manager work with the HAL site liaison to provide the HAL with ATS site survey reports
- Recommend NADP QA Manager work with the HAL and the NOS to implement an external review process for annual HAL QA reports

2003 Review Findings

- HAL Staff
- Facilities
- Site Support
- Sample Receipt & Processing
- Raingage Chart Processing
- Sample Analysis
- Data Management & Analysis
- New Initiatives

Review Findings: HAL Staff

- Staff were enthusiastic and knowledgeable about their specific areas of responsibility
- HAL staff and management are commended for keeping up with significant increase in the laboratory's workload

Facilities

- Newly renovated facilities are well designed, orderly, and extremely clean
- All safety issues from 2000 review addressed, additional minor recommendations made
- Current facilities more than adequate to handle additional growth in the number of MDN sites for the foreseeable future

Site Support

- Recommend that Operator Instruction Manual (IM) be revised and updated in conjunction with the Program Office and the Network Operations Subcommittee
- Recommend that Field SOP be revised to be consistent with the revised IM
- Recommend that the HAL and the Network Equipment Depot (NED) in Champaign work together to significantly increase the spare parts inventory available for the MDN

Site Support

- Recommend that communications between the HAL and site operators / site supervisors be streamlined with a primary site liaison at HAL
- Recommend better tracking of site issues to closure

Sample Receipt & Processing

- Recommend log-in of samples at the time that they are delivered, not when the sample reaches the laboratory
- Recommend sample receipt log be in an electronic format to improve the early identification of gaps/missing samples
- Recommend HAL personnel not change field operator comments based on their own observations

Sample Receipt & Processing

- Recommend way to distinguish MeHg samples upon receipt
- Recommend analysts perform at least one calibration check each day to be sure the balance is working properly

Raingage Chart Processing

- Recommend HAL work within NADP committee structure to approve any changes to the rain gage reading procedure
- Recommend total weekly precipitation based on site operator calculations and those of HAL personnel be entered into the database for comparison
- Recommend site operators be contacted if substantial differences occur between rain gage interpretations by the site operator and HAL personnel

Raingage Chart Processing

- Recommend that NOS reconsider current coding practices that classify sample as "undefined" if the event recorder indicates the sampler was open for six hours or more in any sample period with no precipitation or more than 30 minutes at the end of a single precipitation event

Sample Analysis

- Team impressed with the amount of quality control and quality assurance in place at the HAL
- Team found no evidence that quality assurance practices are not working or require corrective action
- Team recommend the HAL develop a procedure to provide for duplicate entry of the mercury data, and investigate options for direct data acquisition software

Sample Analysis

- Recommend HAL clarify terms for blanks and provide a consistent reporting unit
- Recommend that field blanks be summarized in future QA reports and in data submissions to the Program Office
- Recommend that annual MDL determinations be reported in annual QA reports and to the Program Office

Data Management & Analysis

- Frontier IT structure and internal network is more than adequate for the needs of the HAL and is efficiently run and adequately documented by Frontier staff
- Team pleased that Hg_t data deliverables were delivered ahead of schedule.
- Recommend that HAL Access database be better protected from accidental changes through user-specific rights
- Recommend HAL develop a transaction log that automatically records all changes to data

Data Management & Analysis

- Recommend HAL begin planning, with the input and assistance of the PO, for a move to a more robust database management system like SQL Server
- Recommend HAL develop it's own software, not Program Office. Program Office should serve as development consultant and as QC reviewer of new utilities/tools

Data Management & Analysis

- Recommend HAL deliver the 2002 MeHg split sample data to the PO and should begin regularly delivering all MeHg data on the established quarterly submittal schedule
- Recommend MeHg data set be incorporated into the existing Hg_t Access database
- Recommend that the HAL and the Program Office provide annual summary of data completeness similar to the NTN
- Recommend quarterly data memos from HAL to Program Office be continued

Data Management & Analysis

- Recommend PO and HAL work together to resolve confusion in sample coding. PO should provide thorough written documentation of the new coding scheme
- Recommend PO and HAL take joint responsibility to make coding and data formatting uniform for the entire MDN data set, working with appropriate NADP subcommittees

Data Management & Analysis

- Recommend that the appropriate Quality Rating (QR) codes be added to the quarterly report sent to site supervisors
- Recommend PO develop formal documentation (SOPs) for all MDN-data processes
- Recommend PO make MDN QC results available via the NADP web page

New Initiatives

- Recommend HAL science advisor and the laboratory director interact with an NADP ad hoc Mercury Working Group and other interested parties to discuss development of plans for a Hg dry deposition component to MDN

Summary

- The Team agrees HAL is performing at a high level of efficiency and providing the Mercury Deposition Network with reliable data on mercury concentrations in wet deposition
- Recommendations made by the Team are intended to provide the HAL management and the NADP Executive Committee with constructive suggestions for improving upon a laboratory facility that is internationally recognized for its expertise in mercury chemistry

Evaluation of OTT PLUVIO Precipitation Gage versus Belfort Universal Precipitation Gage 5-780—Supplemental Data, January 15 through July 16, 2002

Background

The National Atmospheric Deposition Program (NADP) was established in 1977 to study atmospheric deposition and its impact on the environment. The program's National Trends Network (NTN) includes wet atmospheric deposition networks at more than 250 sites across the United States, Canada, Puerto Rico, and the Virgin Islands (National Atmospheric Deposition Program, 2003). Precipitation amounts are currently measured at all NTN sites using the Belfort Universal Precipitation Gage 5-780 (Belfort), which involves technology that is more than 50 years old.

In 1999, a three-phase study was begun to evaluate several weighing, all-weather precipitation gages to find a possible replacement for the Belfort gage. One gage that performed consistently well in phase I and II of the study was the OTT PLUVIO precipitation gage (OP). Phase III of the study was to determine the accuracy and comparability of the precipitation data collected using the OP gages and the existing Belfort gages. The NovaLynx Model 260-2510 Standard Rain and Snow Gage (NovaLynx) was used as a reference at two sites. Seven OP gages were installed at six NTN sites across the country, representing a broad range of climatic regimes, for a data collection period of 18 months. The six test sites were: Sand Mountain, Ala. (AL99), Bondville, Ill. (IL11 West and East), Marcell, Minn. (MN16), Smith Valley, Nev. (NV03), Penn State, Pa. (PA15), and Brooklyn Lake, Wyo. (WY95). A report describing the phase III precipitation gage evaluation is available by accessing <http://pubs.water.usgs.gov/wri034167>. After the phase III data collection period ended the NADP extended the data collection another six months, from January 15 through July 16, 2002. This fact sheet supplements the phase III report and evaluates the additional six months of data collected.

For the additional six months of data collection the OP gages at IL11 East and West, MN16, NV03, and PA15 were still in operation. As reported in the original report (Tumbusch, 2003), data-retrieval difficulties caused sites AL99 and WY95 to end participation in the study before the original 18-month data-collection period ended.

Data loss varied considerably from gage to gage (table 1). Mechanical difficulties were a major problem with the Belfort gages; the OP gages lost data because of downloading problems. The OP gage at PA15 had no lost data, while the corresponding Belfort gage lost 28 days out of 183 data collection days.

Results

A summary of test results for both the OP and Belfort gages were compiled for each site and are shown in tables 1 and 2. One data set was developed with non-event or zero data removed. Suspected false-positive data were removed to create another data set. An OP false positive was defined as a recorded response from the OP gage (typically 0.01) and a zero response from the Belfort gage when the site operator reported a zero precipitation day and there was no recorded opening of the NTN site sample collector. Paired t-tests were run on both the precipitation events and adjusted data sets, using a 95 percent confidence interval. Both data sets also were evaluated using the Wilcoxon signed-rank test (a non-parametric statistical test) to compare gage performance. The null hypothesis for the analysis was that the mean (paired t-test) or the median (Wilcoxon signed-rank test) difference between the gage measurements equal zero.

For the purpose of this study, all of the data recorded by the NovaLynx gages were used as a reference for comparing precipitation measurements from gages at sites IL11 and PA15 (table 3). No data sets were removed for these comparisons.

Table 1. Differences of precipitation measurements between the OTT PLUVIO Precipitation Gage and Belfort Universal Precipitation Gage 5-780, collected during phase III supplemental data evaluation

[Abbreviations: OP, OTT PLUVIO Precipitation Gage; Belfort, Belfort Universal Precipitation Gage 5-780.]

Site	Number of days of lost data OP/ Belfort	Precipitation events dataset: Number of precipitation events	Mean precipitation, OP/ Belfort (inches)	Median precipitation, OP/ Belfort (inches)	Total precipitation, OP/ Belfort (inches)	False positives removed dataset: Number of false positives removed	Adjusted number of events	Adjusted mean precipitation, OP/ Belfort (inches)	Adjusted median precipitation, OP/ Belfort (inches)	Adjusted total precipitation, OP/ Belfort (inches)
IL11 East	14/15	66	0.26/0.25	0.05/0.05	16.97/16.46	17	52	0.32/0.32	0.10/0.11	16.78/16.46
IL11 West	7/15	109	0.18/0.17	0.02/0.00	19.23/18.10	51	65	0.29/0.28	0.06/0.06	18.53/18.10
MN16	7/21	106	0.07/0.07	0.01/0.01	7.88/7.49	33	73	0.11/0.10	0.03/0.03	7.72/7.49
NV03	11/12	56	0.03/0.02	0.01/0.00	1.58/1.13	34	22	0.06/0.05	0.02/0.03	1.24/1.13
PA15	0/28	75	0.24/0.25	0.10/0.11	17.75/18.41	2	73	0.24/0.25	0.13/0.12	17.73/18.41

Table 2. Differences of measurements at the National Trends Network sites using the paired t-test and the Wilcoxon signed-rank test during phase III supplemental data evaluation

Site	Precipitation event data set: Mean difference	*p*-value	Mean equals zero	False positive removed: Mean difference	*p*-value	Mean equals zero	Precipitation event data set: *p*-value	Median equals zero	False positives removed: *p*-value	Median equals zero
	Paired t-test						Wilcoxon signed-rank test			
IL11 East	0.008	0.183	Do not reject	0.006	0.402	Do not reject	0.097	Do not reject	0.439	Do not reject
IL11 West	0.010	0.001	Reject	0.007	0.205	Do not reject	~0	Reject	0.199	Do not reject
MN16	0.004	0.615	Do not reject	0.003	0.769	Do not reject	0.001	Reject	0.130	Do not reject
NV03	0.008	~0	Reject	0.005	0.373	Do not reject	~0	Reject	0.144	Do not reject
PA15	-0.009	0.137	Do not reject	-0.009	0.125	Do not reject	0.543	Do not reject	0.446	Do not reject

Table 3. Differences of precipitation measurements between the Belfort Universal Precipitation Gage 5-780, OTT PLUVIO Precipitation Gage, and the NovaLynx Model 260-2510 Standard Rain and Snow Gage, using the paired t-test and Wilcoxon signed-rank test at sites IL11, for 63 comparisons and PA15 for 64 comparisons.

[Abbreviations: --, no data; Belfort, Belfort Universal Precipitation Gage 5-780; OP, OTT PLUVIO precipitation gage; NovaLynx, NovaLynx Model 260-2510 Standard Rain and Snow Gage.]

Gage and site	Mean precipitation (inches)	Median precipitation (inches)	Total precipitation (inches)	Paired t-test: Mean difference	*p*-value	Mean difference equals zero	Wilcoxon signed-rank test: *p*-value	Median difference equals zero
Belfort, IL11	0.28	0.06	17.33	0.037	~0	Reject	~0	Reject
OP, IL11 East	0.33	0.07	20.93	0.305	~0	Reject	0.112	Do not reject
OP, IL11 West	0.33	0.11	20.58	-0.015	0.002	Reject	0.078	Do not reject
NovaLynx, IL11	0.32	0.08	19.66	--	--	--	--	--
Belfort, PA15	0.37	0.19	23.94	-0.011	0.026	Reject	0.003	Reject
OP, PA15	0.38	0.20	24.49	-0.003	0.661	Do not reject	0.203	Do not reject
NovaLynx, PA15	0.38	0.20	24.69	--	--	--	--	--

The box plots in figure 1 show the differences in inches between the daily precipitation measured by the Belfort and OP precipitation gages. The median lines for the five sites are located at or close to zero, with slight variability of distribution for the middle 50 percent of the data. IL11 West and PA15 sites showed the greatest variability with the presence of several outliers. The site at PA15 had more outliers for positive differences indicating the Belfort gage recorded higher measurements than the OP gage.

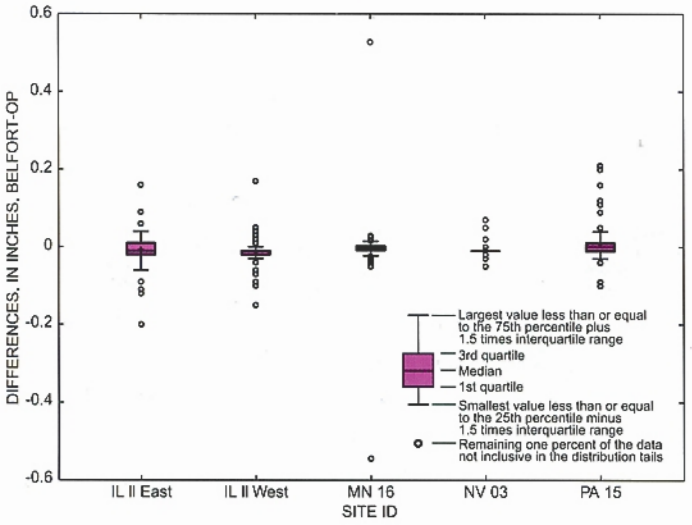


Figure 1. Differences between the daily precipitation measured by the Belfort Universal Precipitation Gage 5-780 and OTT PLUVIO precipitation gages.

Cumulative precipitation for all sites is shown in figure 2. Throughout phase III supplemental testing, the precipitation events measured by the OP gages were generally higher than the Belfort gages. The gages at PA15 were the exception; cumulative precipitation at the Belfort gage was 0.68-in. higher than the OP gage. Paired t-tests showed no significant differences between the gage measurements at sites IL11 East, MN16, and PA15. When the false positives were removed, the measurements at all sites were not significantly different. Wilcoxon signed-rank tests showed that only the measurements at IL11 East and PA15 were not significantly different. When the false positives were removed, the analysis showed no significant difference between measurements at all sites.

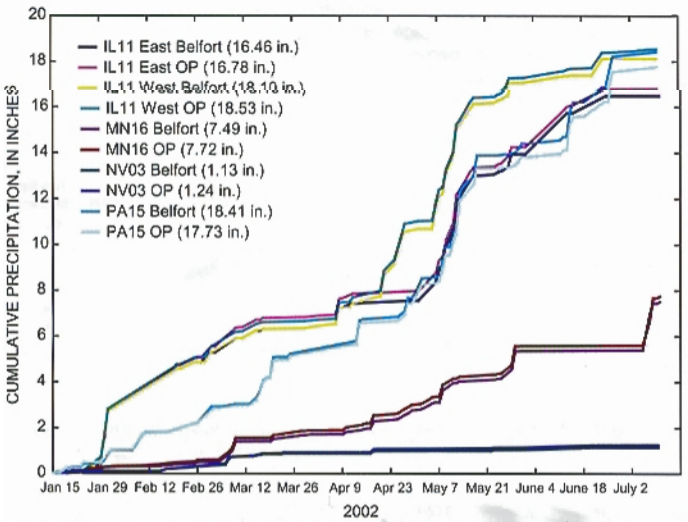


Figure 2. Cumulative precipitation measurements from the Belfort Universal Precipitation Gage 5-780 and OTT PLUVIO precipitation gages.

As part of the phase III supplemental testing analysis, precipitation measurements obtained at sites IL11 and PA15 by the Belfort and OP gages were compared to precipitation measurements recorded by the NovaLynx gages (table 3). No data sets were removed for these comparisons.

Cumulative precipitation measured at site IL11 for the Belfort gage was 17.33 in., the East OP gage was 20.93 in., the West OP gage was 20.58 in., and the NovaLynx gage measured 19.66 in. for 63 comparisons (fig. 3). Paired t-tests showed significant differences between the OP, Belfort, and NovaLynx gage measurements. Wilcoxon signed-rank tests showed no significant differences between the NovaLynx gage and both East and West OP gage measurements; however, the NovaLynx and the Belfort gage measurements were significantly different.

Cumulative precipitation measured at site PA15 for the Belfort gage was 23.94 in., the OP gage was 24.49 in., and the NovaLynx gage was 24.69 in. for 64 comparisons (fig. 3). Paired t-tests showed no significant difference between NovaLynx and OP gage measurements. Paired t-tests for the NovaLynx and the Belfort gage measurements were significantly different. The Wilcoxon signed-rank test showed no significant differences between the NovaLynx and OP gage measurements, but was significantly different for the NovaLynx and the Belfort gage measurements.

——*Mary L. Tumbusch*

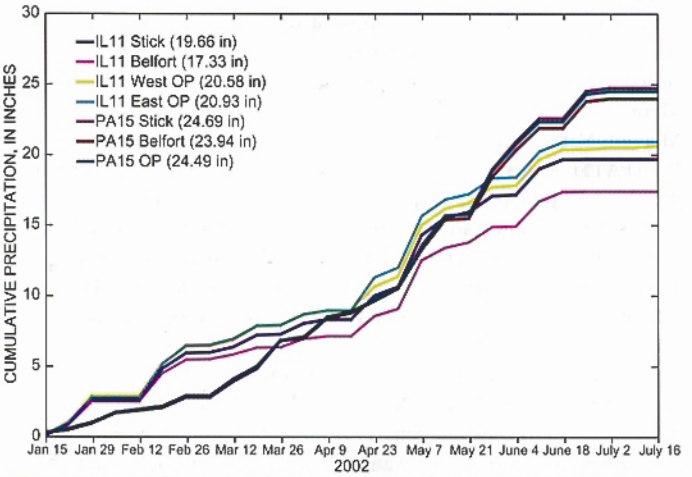


Figure 3. Cumulative precipitation measurements from the Belfort Universal Precipitation Gage 5-780, OTT PLUVIO precipitation gage, and NovaLynx Model 260-2510 Standard Rain and Snow Gage for the sites at IL11 East, IL11 West, and PA15.

References

National Atmospheric Deposition Program, 2003. NADP Site overview page, accessed March, 10, 2003 at URL http://nadp.sws.uiuc.edu/nadpoverview.asp.

Tumbusch, M.L., 2003, Evaluation of OTT PLUVIO Precipitation Gage versus Belfort Universal Precipitation Gage 5-780 for the National Atmospheric Deposition Program: U.S. Geological Survey Water-Resources Investigations Report 03-4167, 25 p. http://pubs.water.usgs.gov/wri034167.

For additional information related to NADP contact:

Illinois State Water Survey
2204 Griffith Dr.
Champaign, IL 61820-7495

Tel: (217) 244-5459
Fax: (217) 333-4983
URL: http://nadp.sws.uiuc.edu

For information on water resources in Nevada and other USGS Programs:

Public Information Assistant
U.S. Geological Survey
333 West Nye Lane, Room 203
Carson City, NV 89706-0866

Tel: (775) 887-7649
Fax: (775) 887-7629
Email: GS-W-NVpublic-info@usgs.gov
URL: http://nevada.usgs.gov

Quality Management Plan (QMP) Approval

Chris Lehmann,
NADP QA Manager

NADP Technical Committee Meeting
October 2003

1

NADP QUALITY MANAGEMENT PLAN

NATIONAL ATMOSPHERIC DEPOSITION PROGRAM

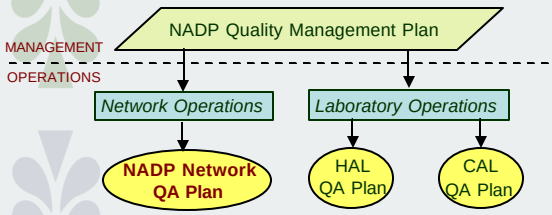
A Cooperative Research Support Program of the State Agricultural Experiment Stations (NRSP-3) Federal and State Agencies and Private Research Organizations

2

Purpose of QMP

- Describes quality management activities, policies and procedures for:
  - Program Management
  - NADP Committees (decision making)
  - Analytical Laboratory Operations
  - Field Site Operations

3



4

Executive Committee Changes

- At yesterday's Executive Committee meeting, changes made:
  - Technical Committee Chair approves on behalf of entire NADP
  - Changes made in Appendix B to clarify advancement of officers

5

Approval of QMP

The Executive Committee recommends to the Technical Committee that the NADP Quality Management Plan be approved and implemented, with the specified changes to the approval process and Appendix B.

6

NADP Siting Criteria

NOS ad-hoc committee report:
Chris Lehmann (chair), Gary Stensland, Bob Larson, Greg Wetherbee, Preston Lewis, Rick Artz

NADP Technical Committee Meeting
October 2003

Some History….

- August 2001: "NOS chair will appoint an ad-hoc group to … review the siting criteria specifics and make recommendations on any needed changes to these specifications"
- Ad-hoc committee reports given at 3 meetings outlining proposed revisions
- March 2003: "After discussion, NOS chair requests the committee rework their suggestions and present recommendations to the committees via email …"

Our Approach

- We took a "fresh look" at original siting criteria (1978) and revisions thereafter
  - Considered "old" criteria, and incorporated where appropriate
  - Provided additional detail and specifications
  - Incorporated NADP Site Classification & Site Characterization schemes
  - Preparing white paper to accompany siting criteria that outlines approach and rationale

Seeking Feedback…

- Want feedback today on approach & rationale, but not on individual criteria
- Comment on criteria via NOS web site
  - http://nadp.sws.uiuc.edu/NOS/
- Final report at Spring 2004 meeting?

"New" Siting Criteria

I – Introduction
  - Purpose of siting criteria

II – Site Classification: Urban (U), Suburban (S), Rural (R), & Isolated (I)
  - Differing criteria based on site classification

III – Siting Rules and Guidelines
  - Rules: New regional sites must comply fully or seek exception; existing sites follow Remedial Action Plan
  - Guidelines: Beneficial to comply; full compliance with guidelines sought, but not required

"New" Siting Criteria

IV – Siting Criteria
A. General Criteria (guidelines)
B. Regional Criteria (> 1km)
C. Local Criteria (< 1 km)
D. On-Site Criteria (< 30 m)

"New" Siting Criteria

V – Regional Characterization
- – Considers Population, Road density, SOx & NOx emissions within 75 km
- – Defines site as being
  - **Regionally Representative** (< 75th percentile??)
  - **Not Regionally Representative** (= 75th percentile??)

VI – Remedial Action Plan

Remaining Work

- Rooftop sampling considerations
- Regional characterization (regional representativeness)
- MDN-specific concerns
- Remedial action plan
- White paper