Petition

For NADP Acceptance

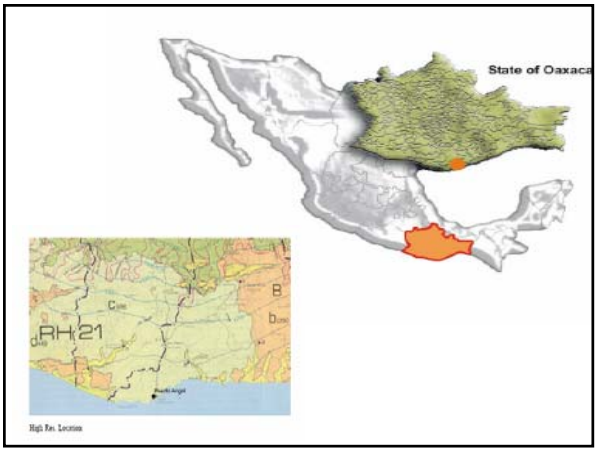
Site: Oaxaca, Mexico

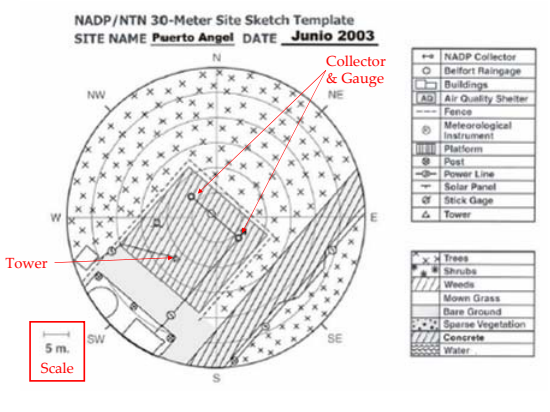
Petitioner: David Gay

Asking:

- Acceptance of the siting of a new MDN station (OA 02) in the southern State of Oaxaca, Mexico
- To be operated by
  - the Mexican Institute for Water Technology
  - at the Mexican National Water Commission observatory, radar station and automatic hydro-climatological station
- To be funded by
  - the North American Commission for Environmental Cooperation.

- Problem:
  - The proposed site is next to a tower (height= > 12 m, distance 10.3 m from collector). Therefore, the tower and support wiring violate the 45 degree rule.
- Petition:
  - That the siting for proposed OA02 be accepted and the site become part of the MDN network.





Roof material is splash prone.

View showing proximity to radar dome and buildings

View showing guy wires over head

Argument

- Moving the collector is not feasible.
  - Established gauge which already has a scientific record and supports other projects
  - Mexican National Water Commission & Mexican Meteorological Service
  - Other funders do not want it moved
- Site is located at 15.7 degrees North (truly tropical)
  - General flow is the persistent northeasterly trades
  - Both the collector and gauge are upwind of the tower and the majority (if not all) of the guy wires
  - Contamination from drip waters cannot be ruled out, but should generally be small.

- Precipitation Conditions
  - Interior Mountains, 1500 to 2500 mm per year (59 to 98 inches, Mexican Meteorological Service)
  - Coastal records show 20 to 40 rainy days per year (June to October) with between 500 and 1200 mm / year (19 to 47 inches)
  - This suggests from 4 to 7 days between rainfall events, suggesting less dry deposition to the wires and tower (at least after the first precipitation event)
  - Summertime rainfall is more likely thunderstorms moving in from the Pacific and Gulf of Tehuantepec,
    - wind direction would be all directions
    - 3 of 4 directions with little/no impact

- Mexican Weather Service location
  - Gauge satisfies the Mexican meteorologists
- Other Considerations:
  - Lack of sites south of the US border
  - Although not perfect, it is much better than no data at all
  - Only the second truly tropical site that we would have (with sister site HD01, at 21 deg. N)
  - Funding agency is the North American Commission for Environmental Cooperation
    - (headquartered in Canada, supported by the Mexican, US, and Canadian governments)
    - This group, would appreciate our extra lengths to support their goals of increased scientific cooperation among North American countries.

Network Equipment Depot Update to NOS Halifax, NS 2004

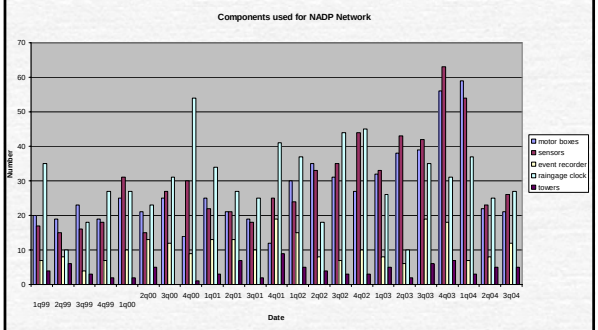
- Parts status
- News Items
- Complaints

Parts Status

PART	AVAILABLE	REPLACED last 12 mos
motor boxes	49	170 down 28%
sensors	62	181 down 18%
event recorders	43	49 no change
gage clocks	89	124 up 23%
gage mechanisms	2	21 down 10%
		====
		545

YEAR	00/01	01/02	02/03	03/04
motor boxes	96	122	144	235
sensors	99	142	171	222
event recorders	55	37	43	49
gage clocks	121	137	116	101
gages	20	17	16	19
	====	====	====	=====
TOTAL	391	455	490	626

Parts Status



Parts Status

GOOD NEWS

parts requests are down

paired box-sensor shipments reduced

the work with our electrical engineer (REIS Labs) on the switching transistors seems to have paid off

News items

We are finished with probably THE re-design of the old style NADP sensor

News items

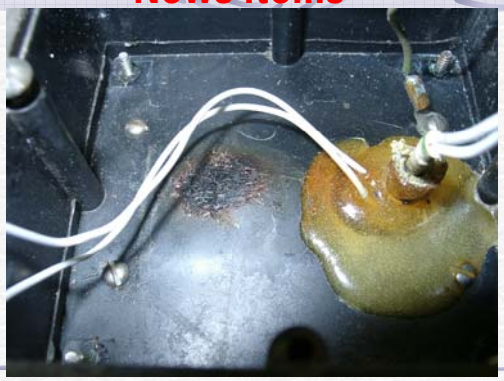
Any further work on sensor technology should move us into an optical or bi-modal sensor.

News items

Re-design for reliability, quality control and repair efficiency.

News items

News items



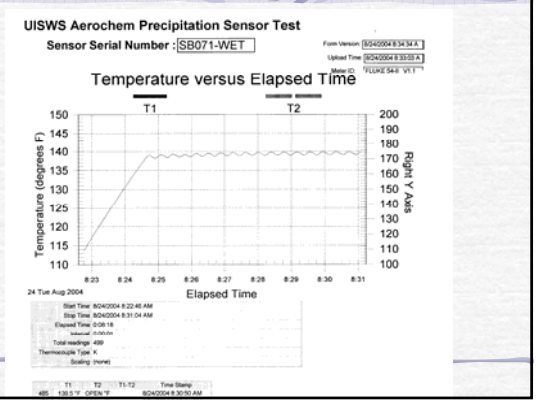
News items

6 prototypes checked and ready to go to the field

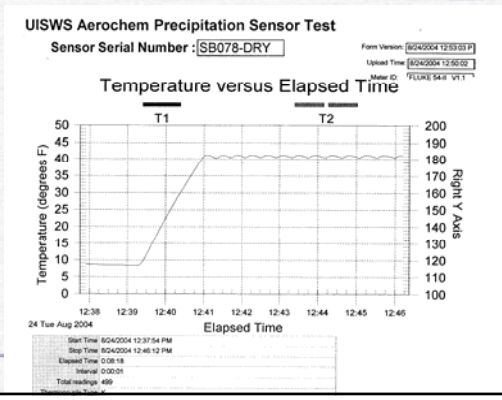
- no change in sensitivity
- better heating control
- power efficiencies

Request OK to allow us to field trial.

News items



News items



News items

NEXT PROJECT

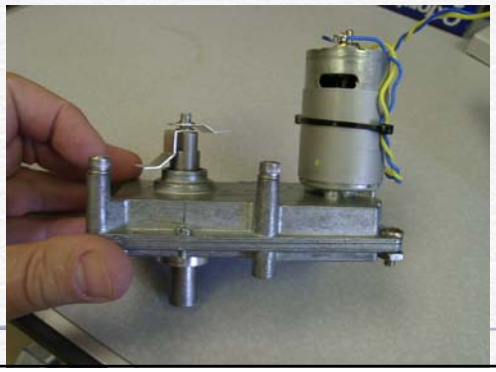
Motor box re-design

News items

- RIES Motor box circuit board
  - Microprocessor controller (compatible with either contact closure or haul effect switches)
  - Less “knob and tube” wiring (3 vs. 9 connections at power bus)
  - More efficient repair
  - Equal sensitivity
  - MORE POWERFUL DRIVE MOTOR

News items

MOLON CEM 1205 gearmotor



News items

News items

- Work with Molon on “off the shelf” and custom motor designs to fit existing motor boxes, power supplies
- Combine Molon unit with REIS Labs controller board and haul effect switches
- Field trial

News items

NC25 event recorder

NOS re-affirms ER use on the network

How far are NTN sites away from towns?

Why is it important or IS IT?

The way I read the current siting criteria document, there is no rule for the placement of sites near urban, industrial, housing or otherwise developed areas, save the 500m and 100m road and parking lot type rules. Of course the 1m object within 5m height rule and the 45 degree "clear to sky" rule may also come into play..this means we'd require them to be 500' from a 500' stack.

Given that (with mixed success) the program has attempted to locate sites “a priori” in areas of mixed airsheds, this represents a MAJOR change in network philosophy. We'd essentially be changing from stated rule of 10km separation to a stated rule of 100m separation.

SO… what does the network look like?

Proximity numbers not available in current PO database.

CAL SITEINFO database used

CAL QUESTIONAIRE

- 253 records
- My guess is that the data or good to 10 or 15%.

Nearest Town or Village to the NADP/NTN Site

Site ID: _____

Site Name: _____

Operator Name: _____

Please, complete the following form using a highway map. Remember that the direction needed is FROM the nearest town TO the site, the site is the unknown.

1. Nearest town/village of 1000 or more population

   _____

2. Nearest town/village of any size that one can find on a road atlas or state highway map.

   _____

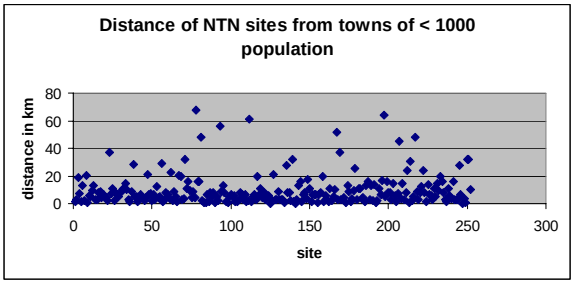
3. Direction FROM town/village (listed in #2) TO the sampler (N, NE, E, etc.) _____

4. Distance from town/village to sampler in a straight line or "as the crow flies" _____

Sketch of site including nearest town, sampler, any physical features (rivers, lakes, etc.) And any man-made features (highways, railroads, structures,

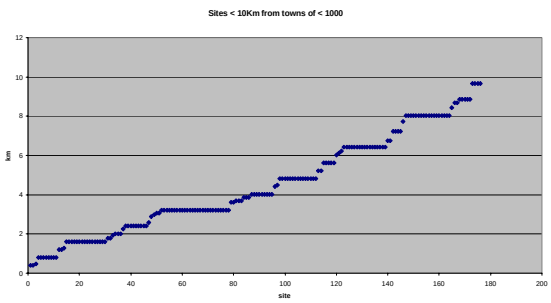
Average NTN network distance from the site to a town with pop. <1000 people (YES we asked the question this way) was 9.419.

The distribution of distances however shows quite a clustering below 10km and many long distance sites (see File 1 attached).



SO.... I trimmed everything out of the spreadsheet which was greater than 10kM.

Of the sites < 10kM from a town < 1000 people (177!) the average distance was 4.4 km.
(See File 2 attached.



I'd like to see use have some RULE for proximity to developed areas and suggest it be set at 5kM.

4-in-1 Shipping Protocol--update

A quick review:

WHY???

- Sites are charged extra shipping by UPS & Fed Exp for non-standard boxes (handles, straps & metal corners)
  ~ $5.00 per mailer plus pick-up charges for weekly shipments
- Complaints from funding agencies at NADP meetings
- Security—homeland security for shipping may require 'sealed' shippers in future
- Need a model for new collector container shipping when new precipitation sampler comes on-line (if not a 3.5 gal bucket)
  Black Cases are ~$75 each; ~$120,000 for mailer inventory at current costs

–**CAL agreed to investigate ways to reduce shipping costs**

4-in-1 Shipping Protocol--update

A quick review:

WHAT??

Establish a trial for shipment sampling supplies to sites from CAL on a monthly schedule

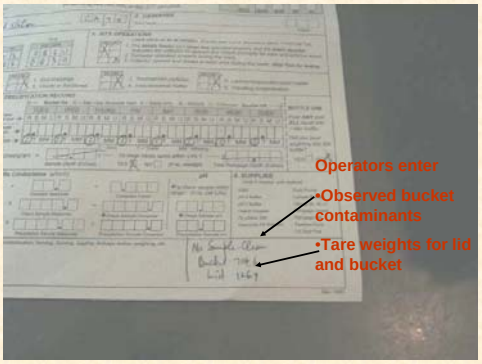
Procedure will allow for a weekly return of 1-Liter sample bottle, raingage chart, and FORF from site to CAL

Procedure will allow for the monthly return of dirty sampling supplies from sites to CAL

What goes out each month

What comes in each week

FORF changes



What comes in each month

Timeline

PHASE 1—6 Sites

6 USGS sites started trial **May 2003**

All used **Federal Express** as carrier

PHASE II—20 Total Sites **Sept 2003** :

USPS and UPS sites added

IMPLEMENTATION PHASE—10 sites or more sites added each month in 2004

Note: Remote USPS sites were prioritized and Jiffy Tuff Guard bags used rather than boxes for USPS sites (PR, VI, AK, HI)

TO DATE: 81 sites using this protocol 31% of the NTN

Days in transit with 4-in-1small box

(based on **date off** to **date received** at CAL)

Sites using Federal Express

ave=2.6; median=2.3

n=340

- Sites using UPS

  ave=4.4; median=3.6

  n=300

- Sites using USPS (remote locations HI, VI, PR, AK)

  ave=8.4; median=7.7

  n=162

- Time for all NTN sites in 2003

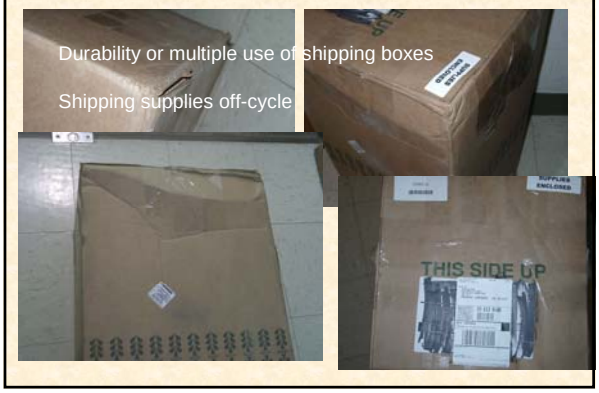
  ave=4.7; median=3.0; SD=3.5

  n=13,177

Problems????

Durability or multiple use of shipping boxes

Shipping supplies off-cycle



Network Issues

- CAL cost to implement??

  What is the cost per month per site
  - Black mailer
    - » assume 5 year life ~ $1.25 per month per site
  - 4-in-1 protocol
    - » assume 3 shipments/box
    - » cost for mailers/tape/other supplies ~ $6.00 per month per site
    - » supply costs higher per sample ~4-5 times more than black mailers
    - » Staff and programming time high 2003-2004 & will be monitored as protocol matures
- Benefits???
  - Sites save on substantially on shipping charges and report minor or no problems in trials to date.
  - CAL savings ????? Need to monitor

    $15,000/year increased supply costs in boxes, tape, misc. labels, etc.

    Savings in mailing costs will be monitored as protocol matures

Now What?

- CAL is continuing to fine tune the protocol and improve the durability of the shipping containers
- CAL will continue to add sites to the 4-in-1 shipping protocol at a rate of 10+ per month throughout 2004 and 2005
- Protocol will be fully implemented at all NTN sites by end of 2005

Lab Operations

Equipment updates:

Continuing laboratory plan to update aging equipment, provide backup instruments and research capability

Lab Operations

June 2004—Dionex Ion Chromatography system purchased to replace 10 year old Dionex 500 systems for nitrate, sulfate, & chloride

Dionex 500 systems ~ 10 yrs old

Will be back-up & research instrument

Dionex ICS 2000, Reagent-free IC

- Hydroxide chemistry will improve signal to noise & chloride resolution
- New data reduction software

Dionex ICS 2000, Reagent-free IC

See poster Demir, et al for details

1. Method Development completed
   Elution order: chloride, sulfate, nitrate
   vs. chloride, nitrate, sulfate
   MDLs; interfering peaks; control charts
   External and internal QA samples analyzed with good correlation
2. Natural precipitation samples being run on both instruments
   through end of 2004; CAL will follow a protocol similar to AAS-ICP evaluation
   Complete report will be presented at Spring 2005 meeting
3. January 2005 CAL will begin running samples on new instrument
   ****assuming no problems!

bar code

NATIONAL ATMOSPHERIC DEPOSITION PROGRAM
A Cooperative Research Support Program of the State Agricultural Experiment Stations (NRSP-3) and the USDA-ARS and Private Research Organizations
http://nadp.sws.uiuc.edu

NATIONAL TRENDS NETWORK
FIELD OBSERVER REPORT FORM (FORF)
Send Completed Form with Each Sample
Problems? Call the CAL at 1-800-952-7353, or
e-mail: ntn@sws.uiuc.edu, or fax: 217-333-0249

FOR OFFICE USE ONLY: N — BAG, LEAK, SP, SL

1. SITE — Name, ID
2. OBSERVER — Print name, Initials
3. BUCKET — ON / OFF; Date (MO, DAY, YR); Time (0001-2400)
4. SITE OPERATIONS — *Check yes or no for all samples. If no for item 1 or 2, describe in Block 10 and call CAL.*
   1. The **sensor heater** and **motor box** operated properly and the **event recorder** indicates the collector lid opened and closed promptly for each precipitation event.
   2. Raingage operated properly during the week.
   3. Collector opened and closed at least once during the week, **other than for testing.**
5. SAMPLE CONDITION — *Check type of contamination for all field buckets before and after decanting. Describe **all** contamination in Block 10, including any not listed here.*
   1. Bird droppings
   2. Cloudy or discolored
   3. Soot/ash/dirt particles
   4. Insects/animal matter
   5. Leaves/twigs/pollen/plant matter
   6. Handling contamination

   After decanting into sample bottle, look closely at sample and bucket and double-check your entry.
6. BUCKET SAMPLE WEIGHT — Weight ALL sample buckets: Bucket + Lid + Sample; CAL Bucket; CAL Lid; Sample Weight (grams); X 0.00058 inches/gram; Sample Depth (inches)
7. PRECIPITATION RECORD — Bucket On ← R – Rain Only (Includes Hail) S – Snow Only M – Mixture U – Unknown → Bucket Off
   TUES | WED | THURS | FRI | SAT | SUN | MON | TUES
   Type (circle one); Amount (to the nearest tenth, circle one)
   Z – Zero T – Trace MM - Missing
   Do these values agree within ±5% ? YES NO (if no, re-weigh!)
   Total Raingage Depth (inches)
   BOTTLE USE — *Pour **ANY** and **ALL** liquid into 1-liter bottle.* Did you pour anything into the bottle? YES NO
8. SAMPLE REMOVAL — Was an aliquot removed for on-site research ? Approximate Volume. ☐ < 50 ml ☐ 50 – 150 ml ☐ 150 – 250 ml
9. SUPPLIES — *Circle if needed, until received.* Request early.
   CAL Address Labels; Gloves (S, M, L); Raingage Charts Used Material Labels; Dashpot Fluid; Lid Seal Pad; Raingage Ink; Field Forms; Packing tape; Sample Bottles
10. REMARKS — *For example: equipment malfunction, contamination, farming, burning, logging, leakage before weighing, etc.*

Rev. 9/04

Executive Committee Report

4-in-1 Shipping Protocol--update

- *–trial began in 2003*
- *–2004 expanded to 81 sites (31%) by Sept 2004*
- *–Sites report saving shipping costs ($$$) and few or no problems*
- *–Continuing to improve protocol*
- *–Expand to all sites by end of 2005*

Projected site shipping cost savings

- Current system, Black mailers shipped weekly
  - Weight ~ 12-14 lbs shipped 4 times/mo
  - Sites paying $52 to $80/mo (ave **$61**)
- 4-in-1 protocol
  - Supplies shipped monthly (Weight ~ 14 lbs full)
  - Sample shipped weekly (Weight < 3 lbs)
  - Monthly cost est. for 1 large box and 4 small boxes shipped to CAL
    - $37 to $60 (ave ~ **$45**)
- Estimate of cost savings
  - saving per month per site
    - $35/mo with 2nd day Fed Exp
    - $15 with 3rd day Fed Exp
    - $5 to $20 with UPS or USPS
      - Note: UPS oversize charge applies
  - **Average ~ $16 to $17 per month (~$200/year) per site**

Network Issues

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    Savings in mailing costs will be monitored as protocol matures

Personnel Issues

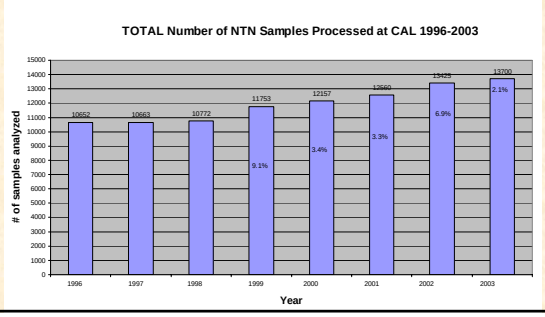
- Scott retiring in fall-winter 2005 (65% CAL)
  - Reassign duties & new hire
- Lab/data need additional staff
- Space allocation (shipping & receiving and sample log-in) when loading dock for ISWS available ~ summer 2005

Lab Operations

CAL sample processing for NADP in 2004

~ 1300 samples/month

~13,000 analyses/month



Lab Operations

- New ISWS building construction
  - will provide much needed shipping and receiving space in 2005
  - Disruptions in 2004
  - Budget impacts???

Other lab/budget issues:

USGS QA/QC program

Since 1996: 400 to 450 site samples per year

100 sites FB (2 per site), 100 sites BA or SHE (2 per site),

and 2 collocated sites

2004/2005: USGS conversion to 3 collocated sites and FB at all NTN sites

Samples to CAL ~ 633/year or a 140% change;

CAL doesn't bill for USGS samples

261 sites FB (2 per site) and 3 collocated sites

Priority mail envelopes sent USPS

Days in transit: 3 to 5; ave=3.7; median=3

Cost=$4.90

Cost of bag – no cost, free from USPS

Tyvek bags sent USPS 1st class

Days in transit: 3 to 7; ave=4.7; median=5

Cost = $0.83 to $3.13; ave=$2.31; median=$2.44

Cost of bag ~ $0.45

Federal Express 2-Day Bags

Waiting for costs..

Lab Operations

Equipment updates:

Continuing laboratory plan to update aging equipment, provide backup instruments and research capability

Jan 2004--Varian Vista Pro Inductively Coupled Plasma Optical Emission Spectrometer (ICP-OES) replaced 10-year old AAS for major cations (Na, K, Mg, Ca)

Lab Operations

June 2004—Dionex Ion Chromatography system purchased to replace 10 year old Dionex 500 systems for nitrate, sulfate, & chloride

Dionex 500 systems ~ 10 yrs old

Will be back-up & research instrument

Dionex ICS 2000, Reagent-free IC

- Hydroxide chemistry will improve signal to noise & chloride resolution
- New data reduction software
- See poster Demir, et al.

USGS External Quality Assurance Project

Summary of the Field-Audit Program

Greg Wetherbee
Natalie Latysh

Field-Audit

- **Began, 2nd Quarter, 1997**
- **Historically 25 NTN sites / quarter - randomly rotated**
- **QC sample sent to each site, 2.25 years to process after a dry week**

Field Audit Samples

- **75% poured in bucket after dry week & 25% remains in original sample bottle**
- **Bucket – minus – bottle concentration differences**
- **Evaluate bias and variability due to field exposure, sample handling, shipping, and laboratory analysis.**

Field Audit Participation

Year	Percentage of Participating Sites
1996-Pilot	89
1997	77
1998	85
1999	70
2000	70
2001	70
2002	70
2003	61

Field-Audit Participation

- **Since 1997, 189 Field-Audit samples shipped to 128 different sites were not processed**
- **Of the 128 sites, 20 sites had more than four dry weeks to process their Field-Audit samples.**

Which Sites Don't Participate?

- 14 sites received Field-Audit samples 3 times, and none were processed . . .
- Not <u>all</u> "wet" sites.

Geographical Quadrant	Number of Sites
WET ➡ NE	42
NW	25
WET ➡ SE	39
SW	22

When is Participation Down?

Calendar Quarter	Percentage of Sites Participating in Same Quarter of Sample Receipt
1	70%
2	51%
3	59%
4	68%

Answer: Spring and Summer…of course.

How will we increase Field-Audit Participation?

- Check online forecasts for sites that still have valid Field-Audit samples in possession, and email reminder to sites with a dry forecast.
- Program Office is sending postcard reminders to sites still in possession of valid Field-Audit samples.

Example Postcard Reminder

Just a friendly reminder…

Greetings! As part of the NADP's quality assurance activities, submission of a field audit sample is required from each site annually. Data derived from the field audit samples contribute to the evaluation of NADP data quality. The USGS mailed a packet to you containing field audit solution along with sample processing instructions. This sample must be processed on a week without precipitation. See USGS http://bqs.usgs.gov/precip/project_overview/FieldBlank/fb_intro.htm.

NATIONAL ATMOSPHERIC DEPOSITION PROGRAM

USGS science for a changing world

As of September 13, 2004, our records show that the field audit sample has not been received from AK03. Please submit your field audit sample to the Central Analytical Laboratory by 9/30/2005.

If you have questions about processing this sample, please feel free to contact us.

Chris Lehmann, NADP QA Manager
Phone: (217) 265-8512
Email: clehmann@uiuc.edu

Natalie Latysh, USGS
Phone: (303) 236-1874
Email: nlatysh@usgs.gov

Thank you for your valuable contribution to this NADP quality assurance program.
Your participation is sincerely appreciated!

Example Field-Audit Report Card

Field Audit Sample Bias Report

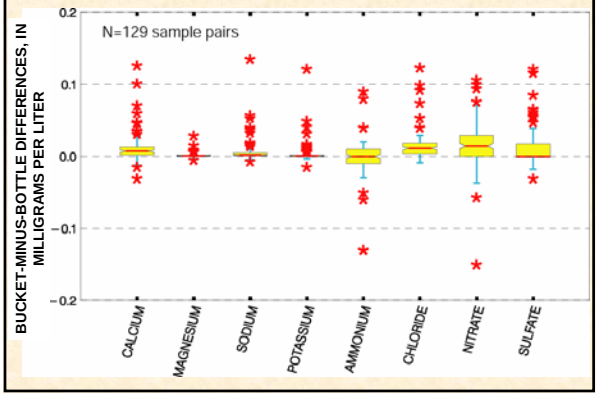
NADP Site: MI26 **Scheduled** Quarter 1 2004 **Date Processed:** 1/13/2004

Solution: Standard Solution SP-3

Ion / Component	Concentration in Original Sample, mg/L	Concentration from Exposed Bucket, mg/L	Bias Sample to Exposed Bucket, mg/L	Expected Range of Bias, mg/L			Is Bias Within Expected Range?
Sulfate	0.93	0.93	0.01	-0.04	to	0.04	Yes
Nitrate	1.03	1.07	0.04	-0.06	to	0.08	Yes
Chloride	0.16	0.17	0.01	-0.03	to	0.05	Yes
Ammonium	0.14	0.14	0.01	-0.04	to	0.04	Yes
Calcium	0.16	0.16	0.01	-0.03	to	0.04	Yes
Magnesium	0.04	0.05	0.00	0.00	to	0.01	Yes
Sodium	0.11	0.12	0.01	-0.01	to	0.01	Yes
Potassium	0.02	0.03	0.00	-0.01	to	0.01	Yes
Hydrogen, ueq/L	15.49	15.49	0.00	-4.56	to	3.26	Yes
Conductivity, uS/cm	11.20	11.30	-0.10	-1.76	to	1.56	Yes

All bias values were within expected ranges.

Field-Audit Results 2000-01



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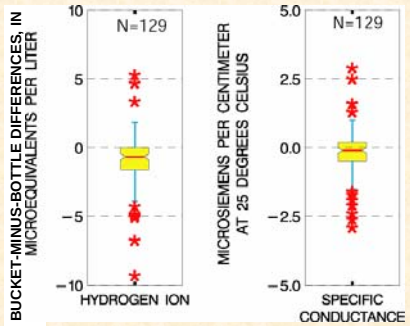
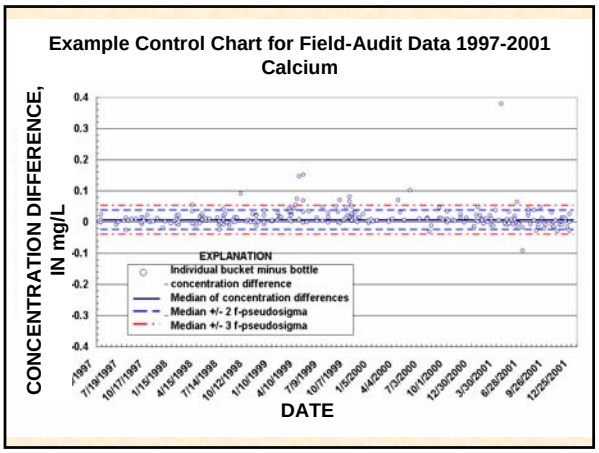
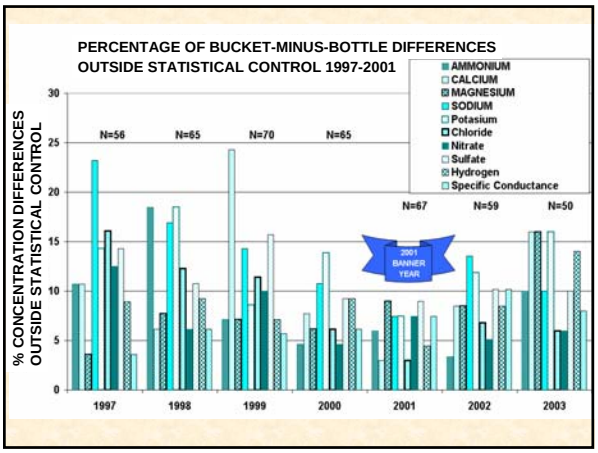




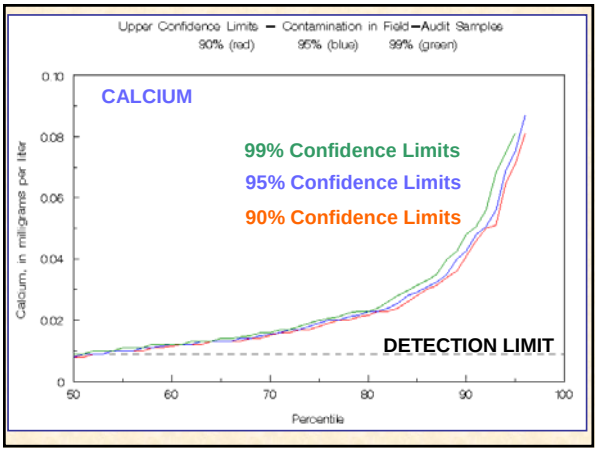


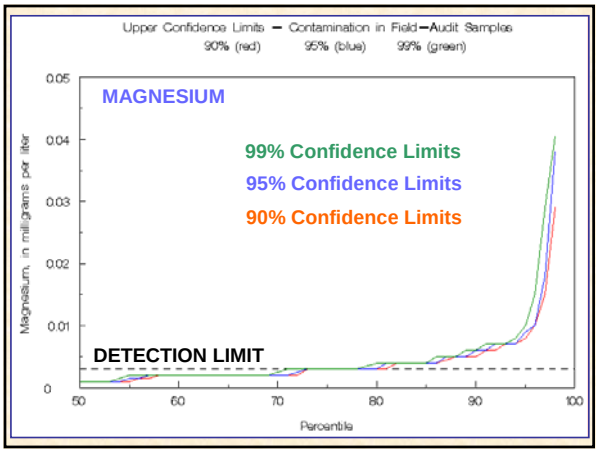
Upper Confidence Limits - Contamination in Field-Audit

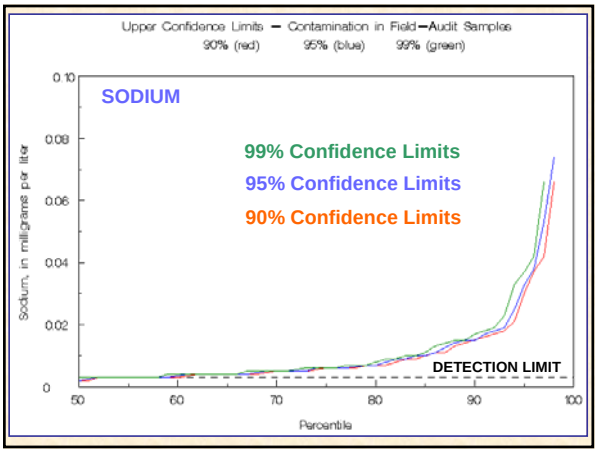
	NO_3			SO_4		
Percentile	90%	95%	99%	90%	95%	99%
80th	0.040	0.040	0.040	0.030	0.030	0.030
90th	0.061	0.063	0.069	0.050	0.054	0.060
95th	0.094	0.100	0.104	0.070	0.080	0.080

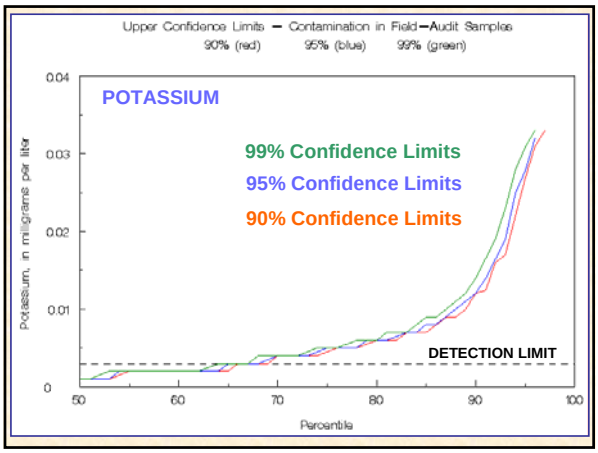
	Spec. Cond.			H		
Percentile	90%	95%	99%	90%	95%	99%
80th	0.3	0.3	0.4	0.206	0.242	0.353
90th	0.6	0.7	0.8	0.713	0.745	0.789
95th	1.3	1.3	1.4	1.92	2.07	3.05

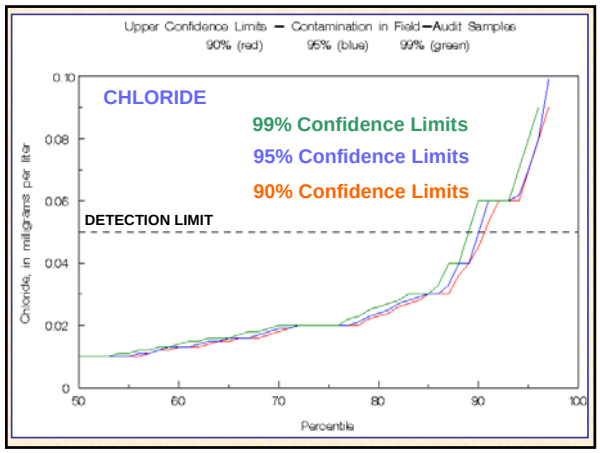
Example: "We are 95% confident that the sulfate contamination in 95% of the field-audit samples is no greater than 0.080 mg/L."

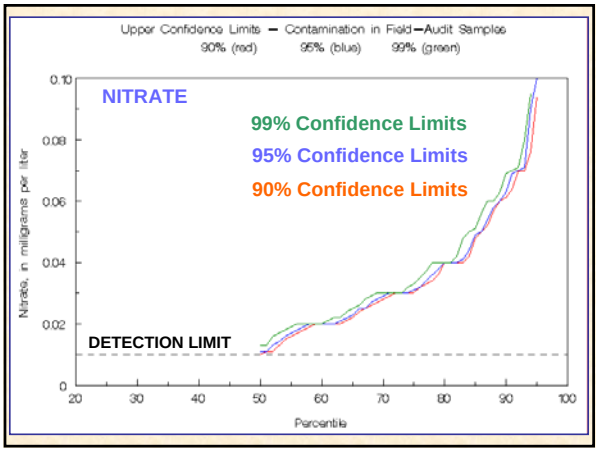


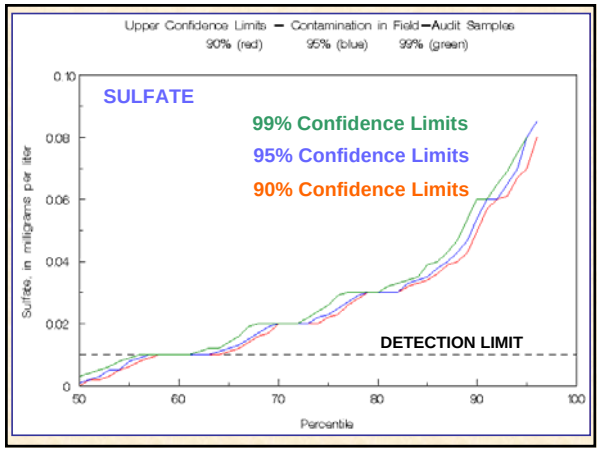


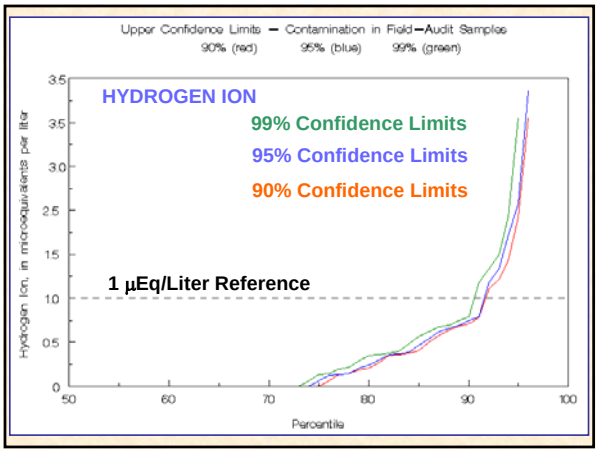












2005 Field-Audit Modifications

- **Starting January 2005**
- **All NTN sites will receive a Field-Audit sample annually.**
- **Synthetic precip and D.I. in 250 mL, 1,000 mL, and 2,000 mL**
- **Sites will receive samples in December and May – 6 months to submit samples after a dry week.**

Quality Management Report

Christopher Lehmann,
NADP QA Manager

NADP Technical Committee Meeting
September 2004

Status Report on QA Activities

- QA Documentation
- Quality Assurance Advisory Group
- Laboratory Operations
- Field Operations

Status of QA Activities: Documentation

- Quality Management Plan
  - Final version approved in December 2003
  - Available on NADP Web Site under "Publications" or as hard copy from PO
- Combined Network Quality Assurance Plan
  - Working on draft
  - Completed draft planned for Spring 2005 NADP Meeting—Will distribute to Quality Assurance Advisory Group for review

Status of QA Activities: Quality Assurance Advisory Group

- The NADP Quality Assurance Advisory Group (QAAG) is currently working on:
  - Formulating NADP Data Quality Objectives (DQOs)
  - Changes to USGS Interlaboratory Rankings
  - Several QA Guidance/Procedures Documents
    - *Guidelines for Quality System and Data Management Reviews*
    - *Guidelines for Laboratory Reviews*
    - *Guidelines for Laboratory Annual QA Reports*

Status of QA Activities: Laboratory Operations

- External review of HAL conducted in June 2003
  - HAL response approved by NOS/DMAS
  - HAL 1-yr followup report received
- CAL review will occur in ?? 2005
  - Same format as 2003 HAL Review
    - 2 reviewers of analytical operations
    - 2 reviewers of data management operations
    - Team leader
    - QA Manager

Status of QA Activities: Field Operations

- USGS External Quality Assurance Programs
  - Sample Handling Evaluation (SHE) Program in NTN ended as of June 2004
  - Field Audit Program in the NTN will expand to all sites in 2005 (currently 100 sites/yr)
  - System Blank Program in the MDN for all sites in 2004
  - 3 "long-term" collocated sites planned starting in October 2004

Status of QA Activities: Field Operations, cont.

- U.S. EPA-supported Site Systems and Performance Surveys
  - All 2003 reports issued to site personnel (104 reports)
  - 2004 reports being sent out within 3 mo of survey date (72 surveys conducted/55 reports received/41 issued)
  - Survey information and siting criteria compliance posted to NADP web site within 12 mo of survey date (170 posted since 2002)

Site Remedial Actions

1. Survey data received at Program Office
2. Site plan view prepared/updated
3. Survey data verified, site survey summary report issued to site operator, supervisor, and funding agency (goal: 3 months after receiving data)
4. Report responses documented (~2 months after report sent)
5. Site plan view, siting criteria posted to NADP web site (~6 months after survey)
6. All actions documented in database

Site Survey Summary Report

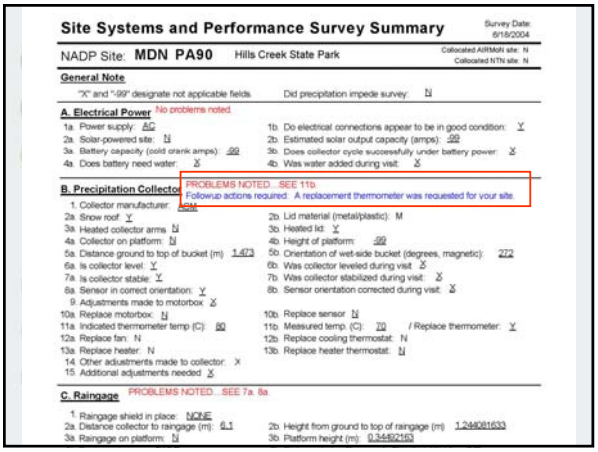
NATIONAL ATMOSPHERIC DEPOSITION PROGRAM

DATE: 9/16/2004
TO: Tom McGuinn, Site Operator, PA90
FROM: Chris Lehmann, NADP QA Manager
Bob Brunette, Frontier Geosciences
Gerard van der Jagt, Frontier Geosciences
SUBJECT: Site Systems and Performance Survey of PA90

Dear Tom:

We wish to thank you for participating in the Site Systems and Performance Survey at PA90. You received an exit report at the time of the survey from the ATS survey team leader. Attached is a more extensive report of the survey results, based on data received at the Program Office. (The file attached is in Adobe Acrobat 5.0 format. Please let us know if you have problems opening this file.) The following items are included in the document.

1. **Site Systems and Performance Survey Summary.** This 2-page report summarizes equipment checks, on-site maintenance, and other service performed by the ATS survey team. The report also shows a site description, and a list of NADP siting criteria issues found during the survey.
2. **Site Inventory.** This 1-page report lists all objects within 30 m of the precipitation collector. Items are located based on azimuth (compass degrees from North), and distance from the collector. Objects that violate NADP siting criteria are noted in red, and a reference is indicated to the corresponding section in the *Site Selection and Installation Manual 2001*, which is available on the NADP web site at "http://nadp.sws.uiuc.edu/lib/".
3. **Site Plan View.** This sketch shows features of your site, and is centered on the collector. Objects that violate NADP siting criteria are noted in red. These objects are also listed in the site inventory report.



Site Systems and Performance Survey Summary

Survey Date: 6/18/2004

NADP Site: **MDN PA90** Hills Creek State Park

Collocated AIRMoN site: N
Collocated NTN site: N

General Note

"X" and "-99" designate not applicable fields. Did precipitation impede survey: N

A. Electrical Power No problems noted.

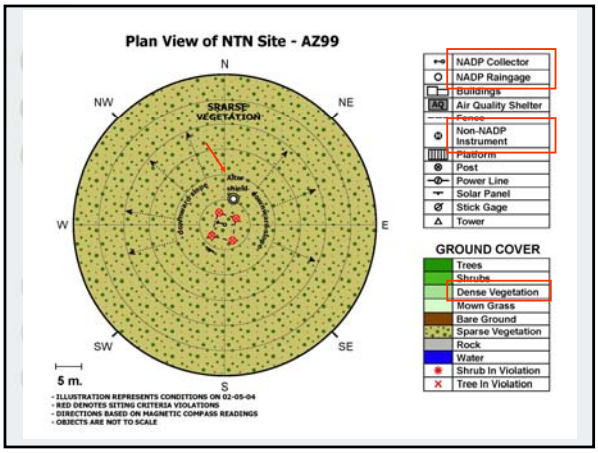
1a. Power supply: AC
2a. Solar-powered site: N
3a. Battery capacity (cold crank amps): -99
4a. Does battery need water: X
1b. Do electrical connections appear to be in good condition: Y
2b. Estimated solar output capacity (amps): -99
3b. Does collector cycle successfully under battery power: X
4b. Was water added during visit: X

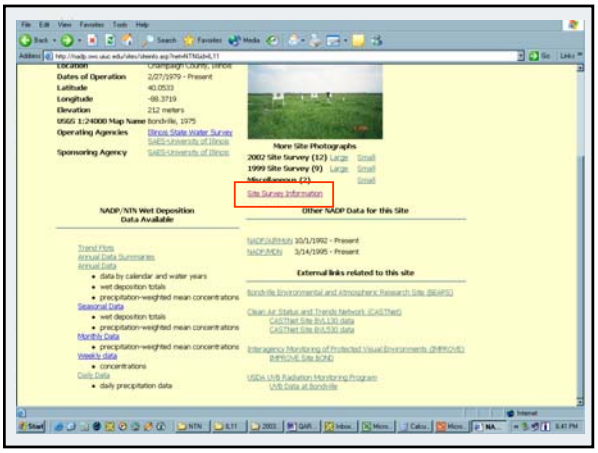
B. Precipitation Collector PROBLEMS NOTED...SEE 11b.
Followup actions required: A replacement thermometer was requested for your site.

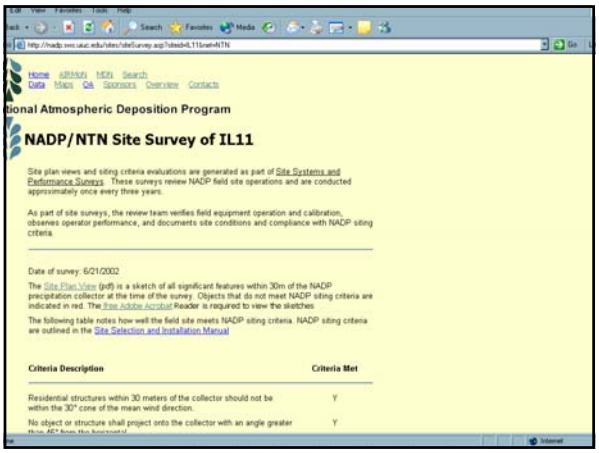
1. Collector manufacturer: Aetal
2a. Snow roof: Y
3a. Heated collector arms: N
4a. Collector on platform: N
5a. Distance ground to top of bucket (m): 1.473
6a. Is collector level: Y
7a. Is collector stable: Y
8a. Sensor in correct orientation: Y
9. Adjustments made to motorbox: X
10a. Replace motorbox: N
11a. Indicated thermometer temp (C): 80
12a. Replace fan: N
13a. Replace heater: N
14. Other adjustments made to collector: X
15. Additional adjustments needed: X
2b. Lid material (metal/plastic): M
3b. Heated lid: Y
4b. Height of platform: -99
5b. Orientation of wet-side bucket (degrees, magnetic): 272
6b. Was collector leveled during visit: X
7b. Was collector stabilized during visit: X
8b. Sensor orientation corrected during visit: X
10b. Replace sensor: N
11b. Measured temp (C): 70 / Replace thermometer: Y
12b. Replace cooling thermostat: N
13b. Replace heater thermostat: N

C. Raingage PROBLEMS NOTED...SEE 7a. 8a.

1. Raingage shield in place: NONE
2a. Distance collector to raingage (m): 6.1
3a. Raingage on platform: N
2b. Height from ground to top of raingage (m): 1.244081633
3b. Platform height (m): 0.34492163







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tional Atmospheric Deposition Program

NADP/NTN Site Survey of IL11

Site plan views and siting criteria evaluations are generated as part of Site Systems and Performance Surveys. These surveys review NADP field site operations and are conducted approximately once every three years.

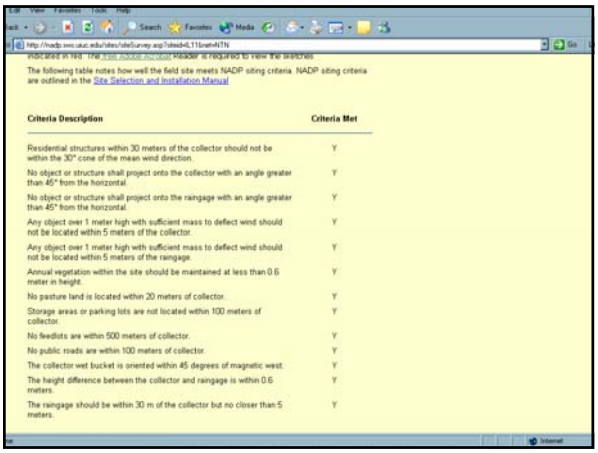
As part of site surveys, the review team verifies field equipment operation and calibration, observes operator performance, and documents site conditions and compliance with NADP siting criteria.

Date of survey: 6/21/2002

The Site Plan View (pdf) is a sketch of all significant features within 30m of the NADP precipitation collector at the time of the survey. Objects that do not meet NADP siting criteria are indicated in red. The free Adobe Acrobat Reader is required to view the sketches

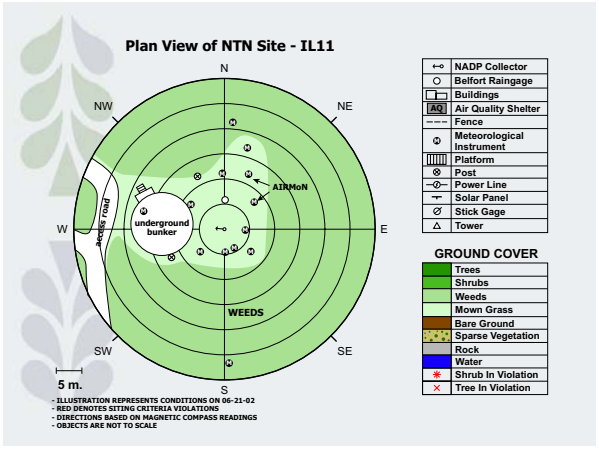
The following table notes how well the field site meets NADP siting criteria. NADP siting criteria are outlined in the Site Selection and Installation Manual

Criteria Description	Criteria Met
Residential structures within 30 meters of the collector should not be within the 30° cone of the mean wind direction.	Y
No object or structure shall project onto the collector with an angle greater	Y



The following table notes how well the field site meets NADP siting criteria. NADP siting criteria are outlined in the Site Selection and Installation Manual

Criteria Description	Criteria Met
Residential structures within 30 meters of the collector should not be within the 30° cone of the mean wind direction.	Y
No object or structure shall project onto the collector with an angle greater than 45° from the horizontal.	Y
No object or structure shall project onto the raingage with an angle greater than 45° from the horizontal.	Y
Any object over 1 meter high with sufficient mass to deflect wind should not be located within 5 meters of the collector.	Y
Any object over 1 meter high with sufficient mass to deflect wind should not be located within 5 meters of the raingage.	Y
Annual vegetation within the site should be maintained at less than 0.6 meter in height.	Y
No pasture land is located within 20 meters of collector.	Y
Storage areas or parking lots are not located within 100 meters of collector.	Y
No feedlots are within 500 meters of collector.	Y
No public roads are within 100 meters of collector.	Y
The collector wet bucket is oriented within 45 degrees of magnetic west.	Y
The height difference between the collector and raingage is within 0.6 meters.	Y
The raingage should be within 30 m of the collector but no closer than 5 meters.	Y



Site Remedial Action Kit

- Kit sent to sites indicating that remedial actions had occurred since site survey
- Kit contains
  - GPS Unit
  - Digital Camera
  - Compass
  - 30-m Tape Measure
  - Instructions & Worksheets