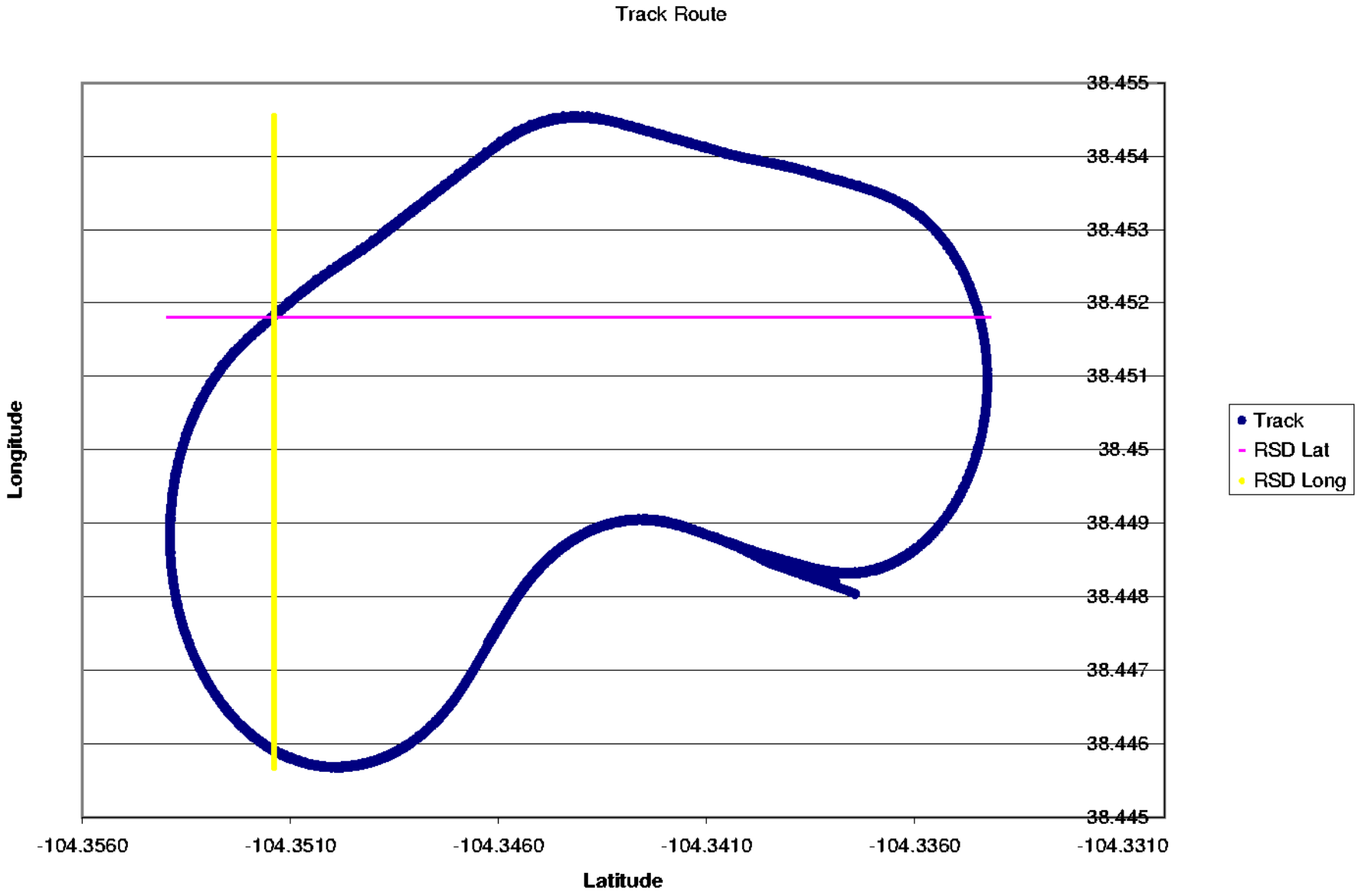
AB1222 Advisory Group Phase 2A Summary

May 21, 2007

Gary Full - ESPH

Testing Overview

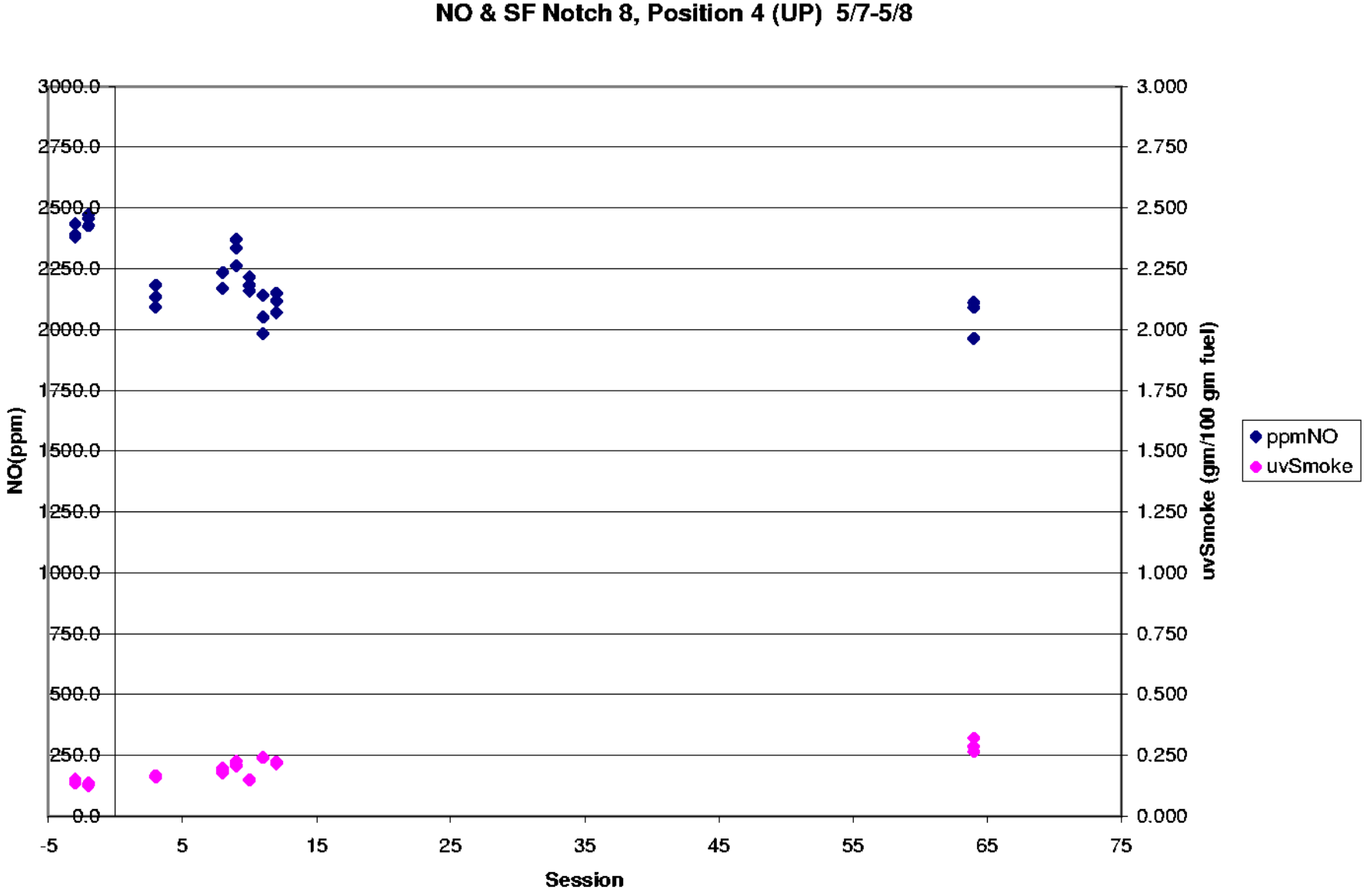
- Installation at Fast Track Site: Sunday 6-May and Monday 7-May.
- Train Session 1: May 7-8 CCW operation (BNSF-NS-CSX-UP)
  - Acquired data, failed control computer replaced, (salvaged data later in week).
  - TTCI provided notch, position, and speed data from instrumented BNSF
- Train Session 2: May 8-9 CCW operation (BNSF-NS-CSX-UP)
  - Generator stopped (**no data**), replaced with van generator for next night
  - Instrumented locomotive (BNSF) replaced due to bearing problem.
- Train Session 3: May 9-10 CW operation (UP-CSX-NS-AAR)
  - Obtained data
  - TTCI provided lap and speed data from bearing temperature station
- Train Session 4: May 10-11 CW operation (UP-CSX-NS-AAR)
  - Obtained data
  - TTCI provided lap and speed data from bearing temperature station
- May 11: De-installed and returned Tucson.

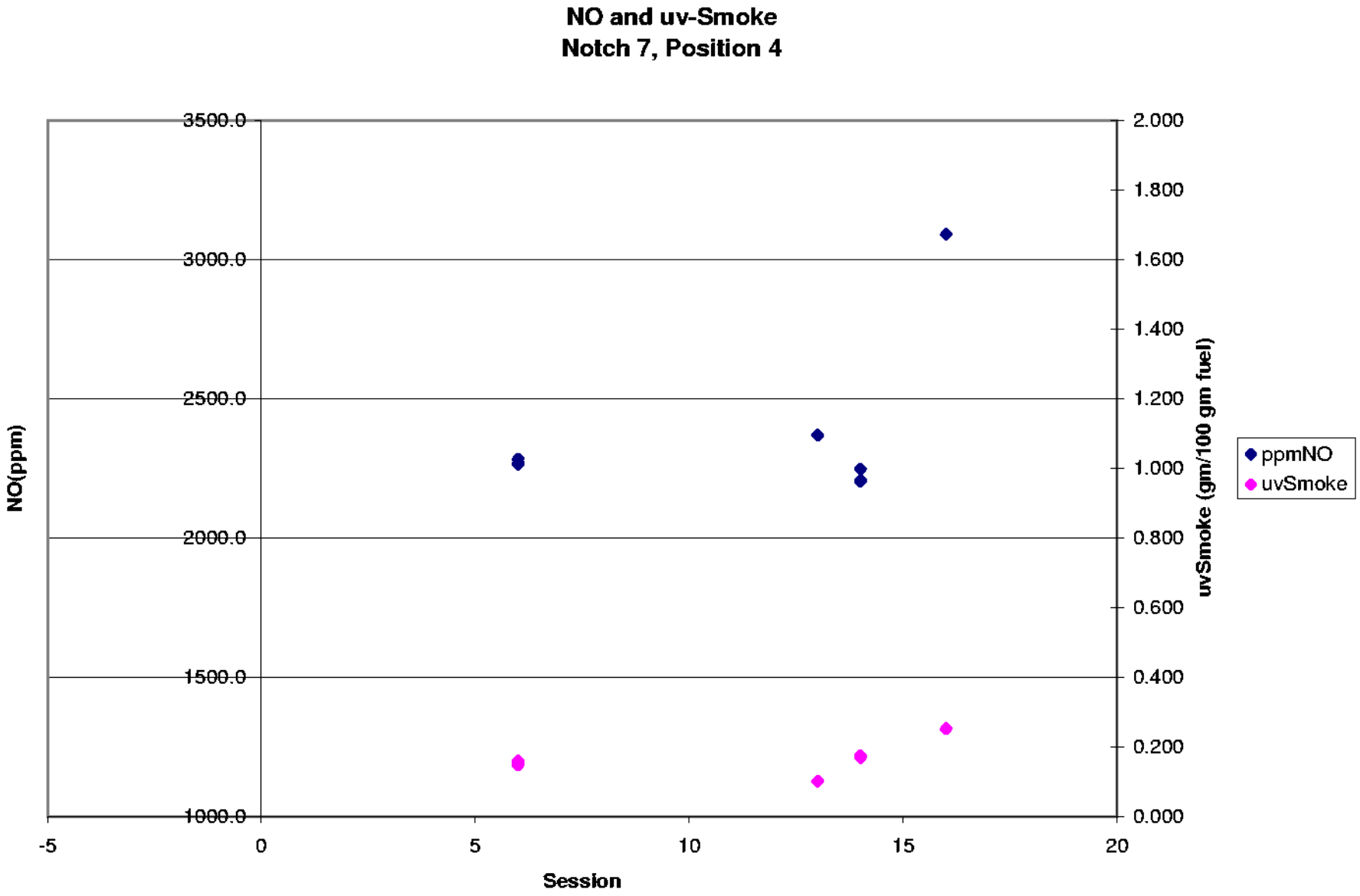

Track Route
38.455
38.454
38.453
38.452
38.451
38.45
38.449
38.448
38.447
38.446
38.445
Longitude
-104.3560
-104.3510
-104.3460
-104.3410
-104.3360
-104.3310
Latitude
Track
RSD Lat
RSD Long

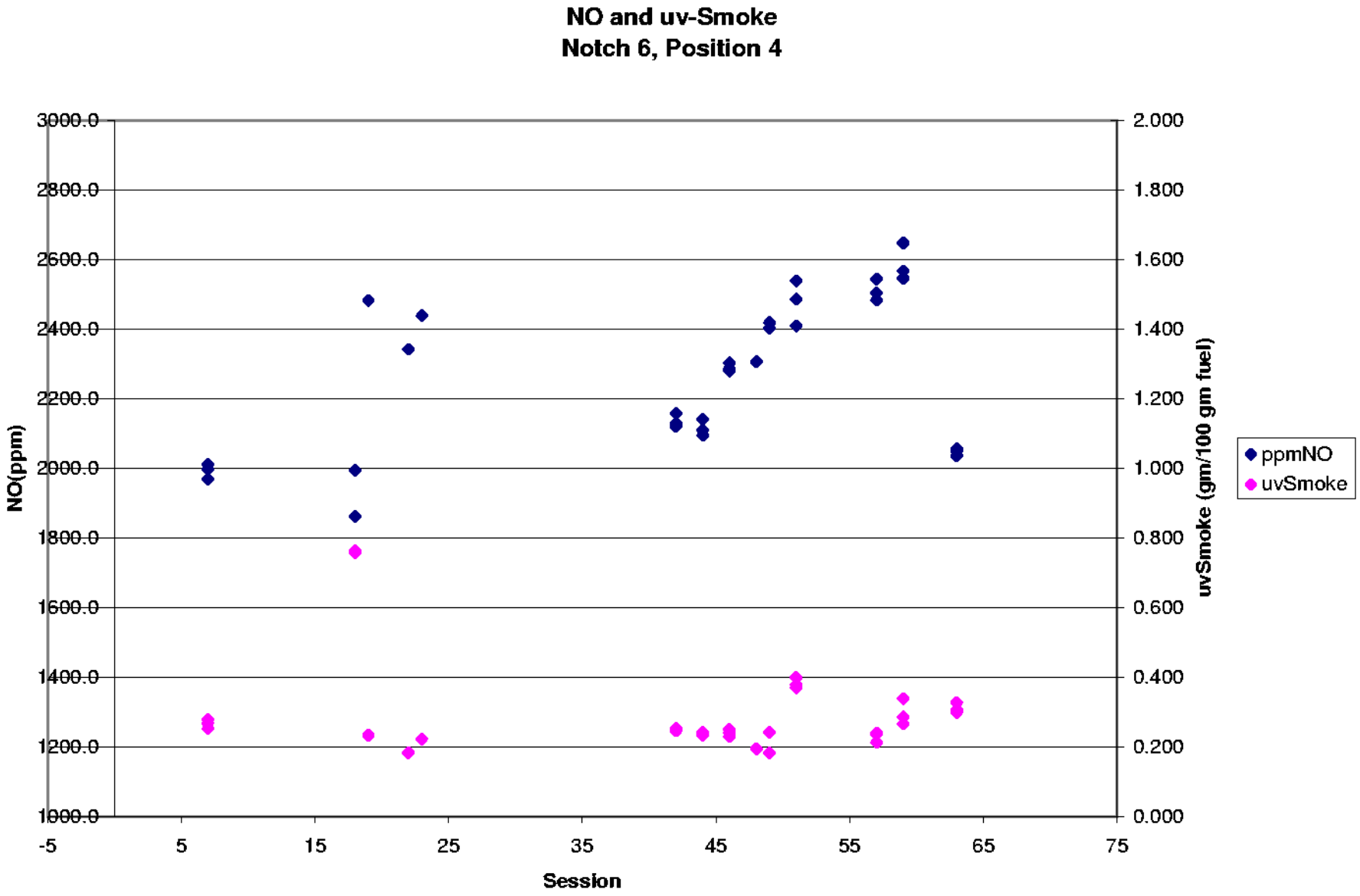

Sample head
Camera boom
Pole not required
05.07.2007
1502
1502

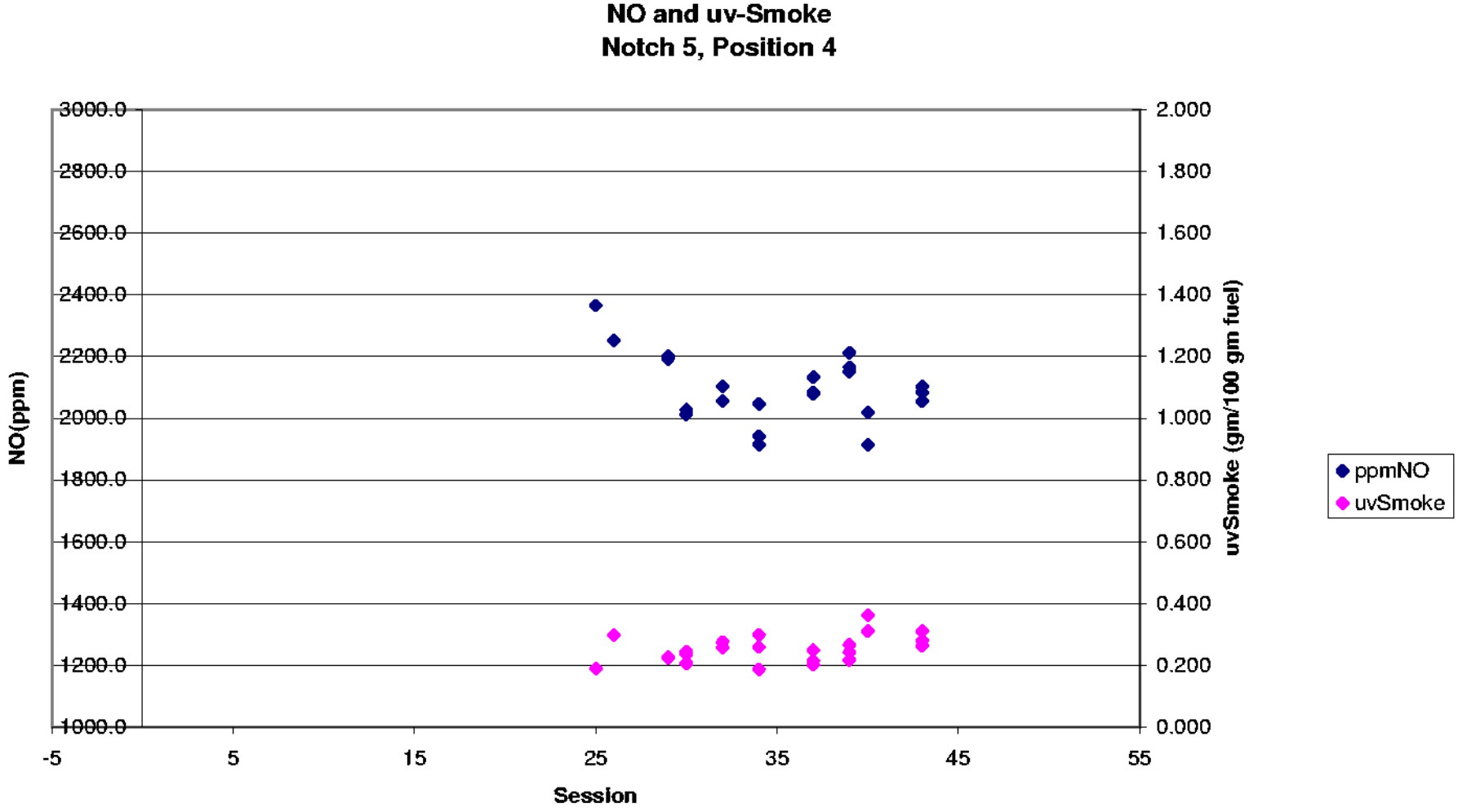

05.06.2007

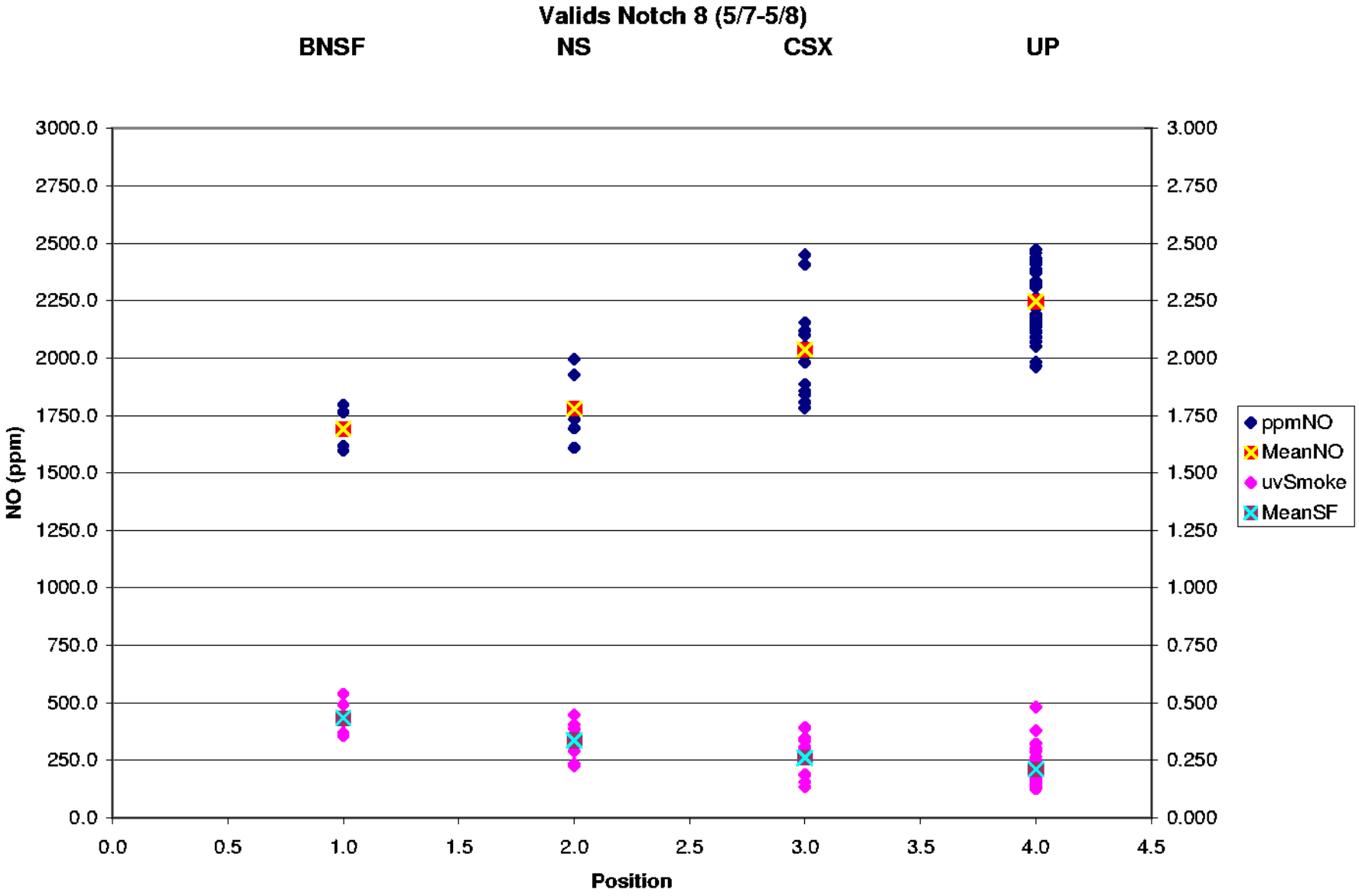

GROUND STATION
Support Trailer
RSD Analyzer in protective enclosure
Accumulator Box
Blower
RSD Mirror in protective enclosure
05 . 07 . 2007

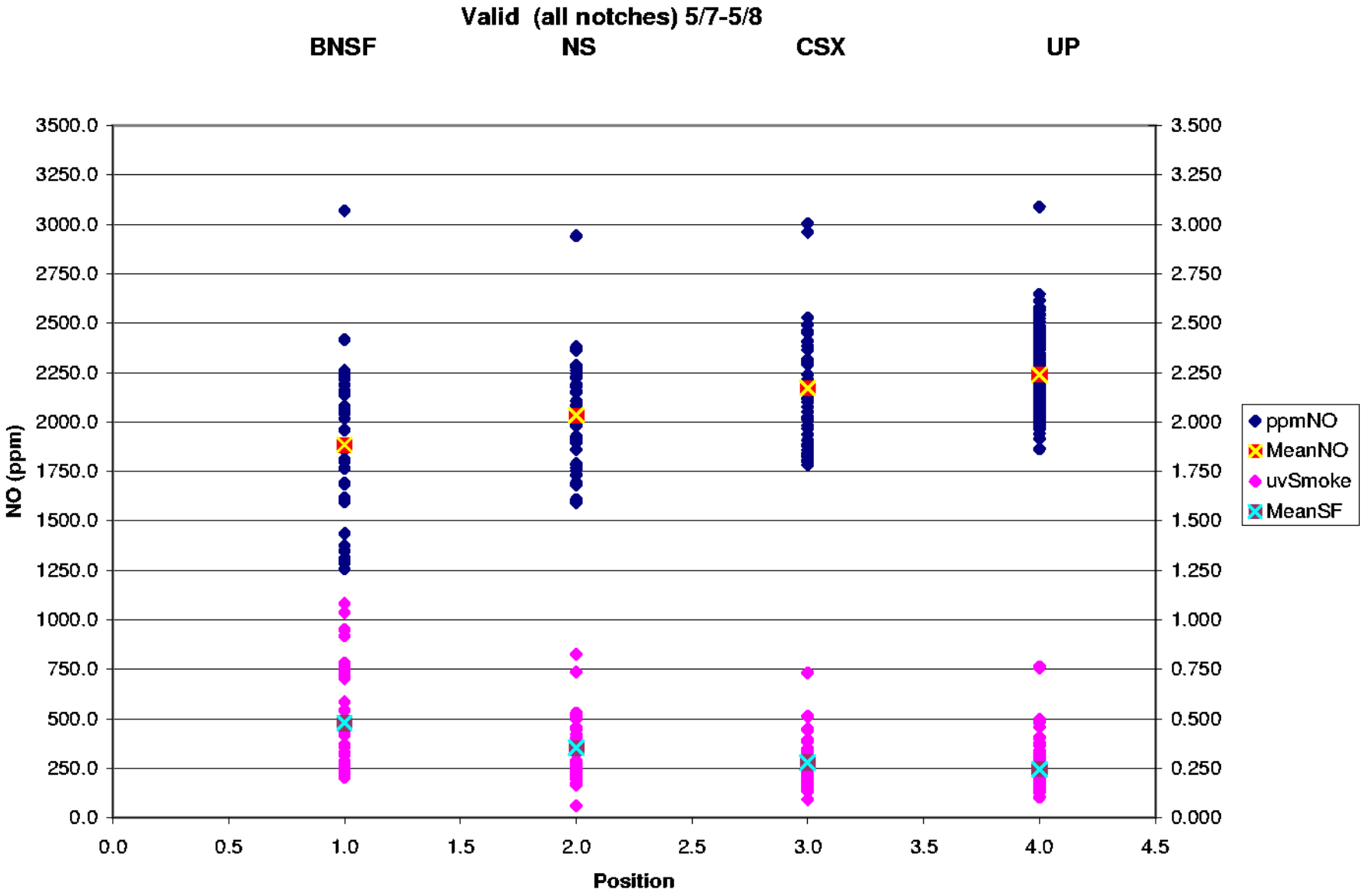

NO & SF Notch 8, Position 4 (UP) 5/7-5/8
NO(ppm)
uvSmoke (gm/100 gm fuel)
Session
3000.0
2750.0
2500.0
2250.0
2000.0
1750.0
1500.0
1250.0
1000.0
750.0
500.0
250.0
0.0
3.000
2.750
2.500
2.250
2.000
1.750
1.500
1.250
1.000
0.750
0.500
0.250
0.000
-5
5
15
25
35
45
55
65
75
ppmNO
uvSmoke

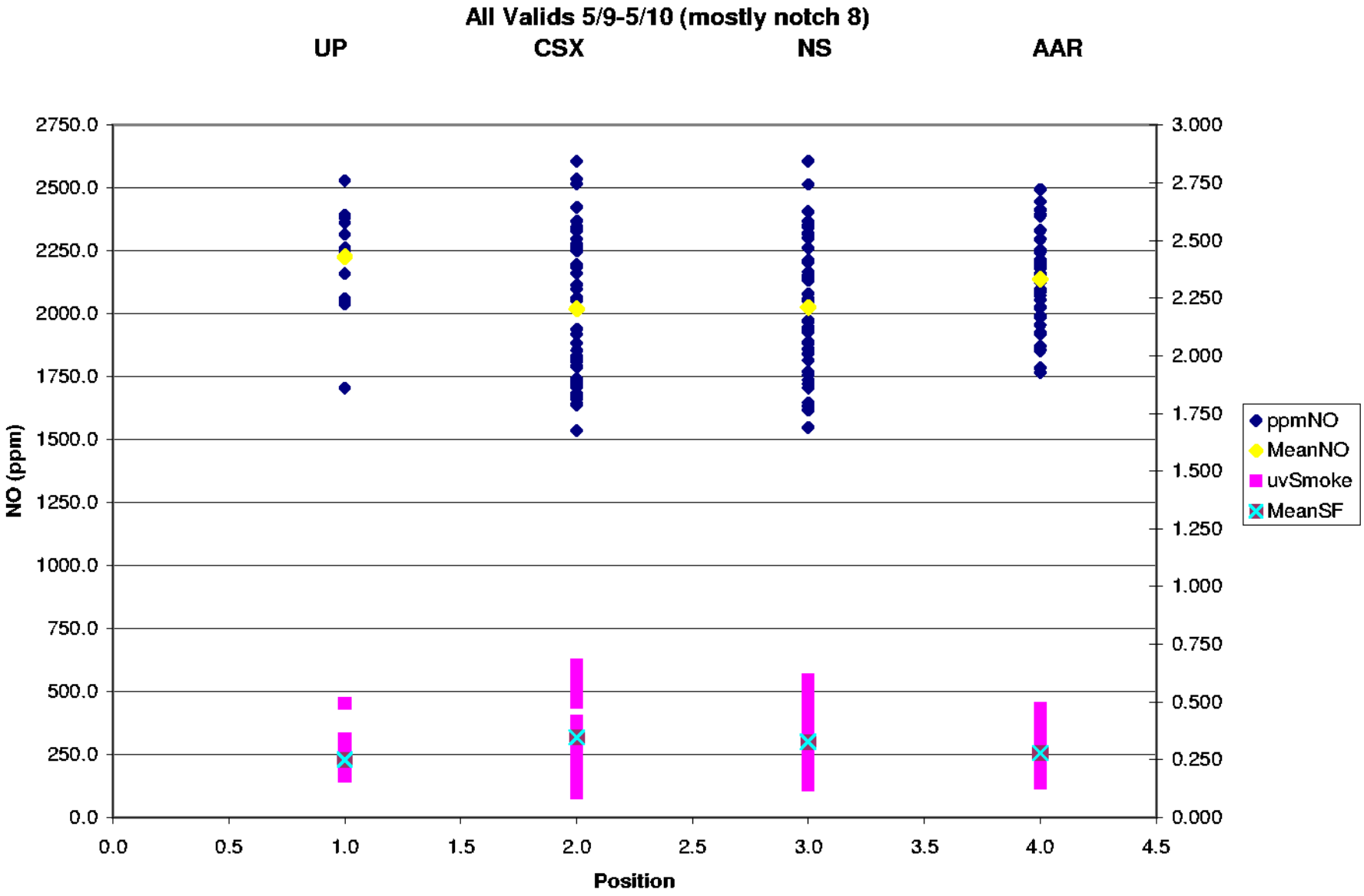

NO and uv-Smoke
Notch 7, Position 4
NO(ppm)
3500.0
3000.0
2500.0
2000.0
1500.0
1000.0
uvSmoke (gm/100 gm fuel)
2.000
1.800
1.600
1.400
1.200
1.000
0.800
0.600
0.400
0.200
0.000
-5
0
5
10
15
20
Session
ppmNO
uvSmoke

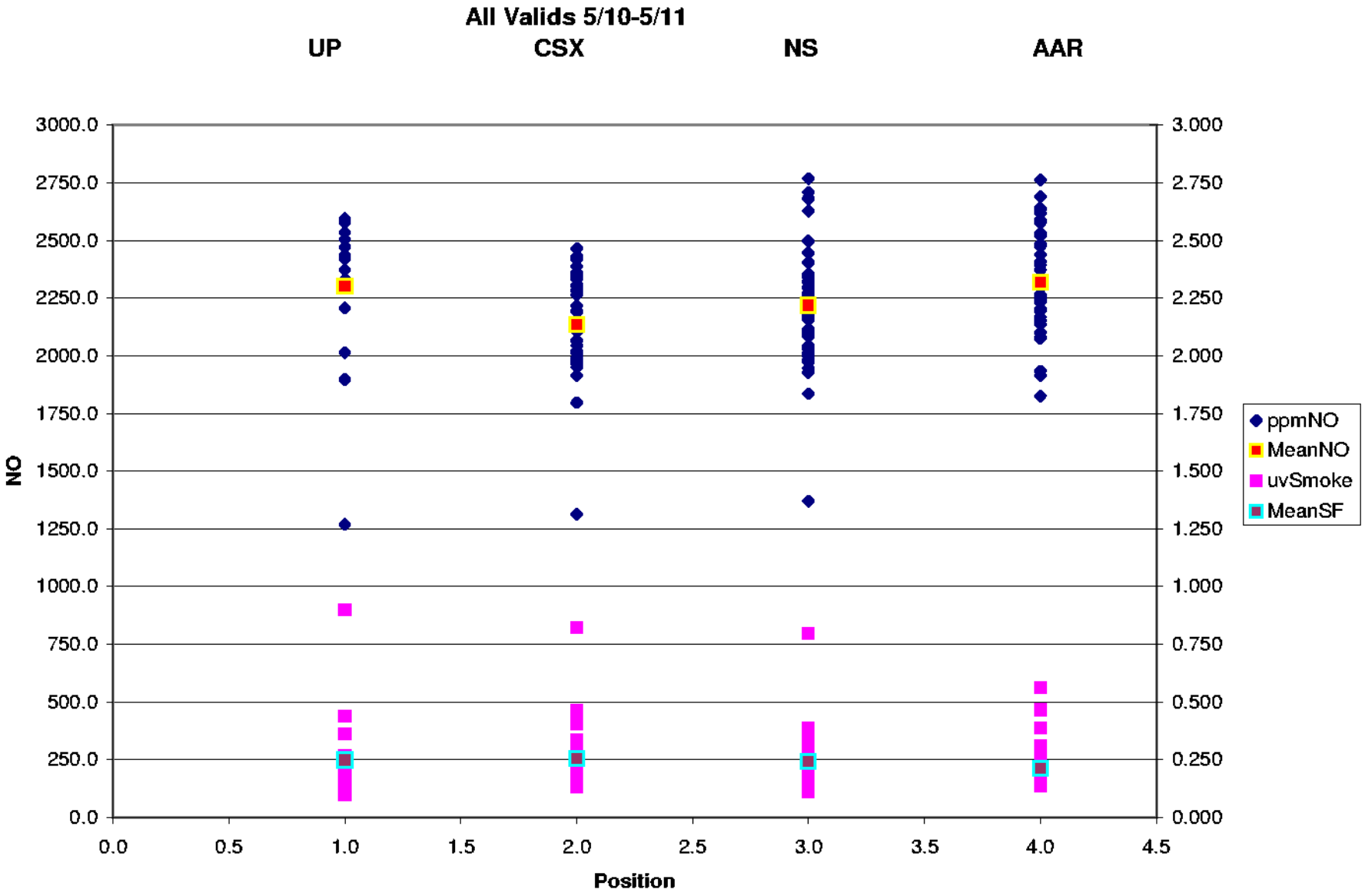

NO and uv-Smoke
Notch 6, Position 4
NO(ppm)
uvSmoke (gm/100 gm fuel)
Session
3000.0
2800.0
2600.0
2400.0
2200.0
2000.0
1800.0
1600.0
1400.0
1200.0
1000.0
2.000
1.800
1.600
1.400
1.200
1.000
0.800
0.600
0.400
0.200
0.000
-5
5
15
25
35
45
55
65
75
ppmNO
uvSmoke


NO and uv-Smoke
Notch 5, Position 4
NO(ppm)
3000.0
2800.0
2600.0
2400.0
2200.0
2000.0
1800.0
1600.0
1400.0
1200.0
1000.0
uvSmoke (gm/100 gm fuel)
2.000
1.800
1.600
1.400
1.200
1.000
0.800
0.600
0.400
0.200
0.000
-5
5
15
25
35
45
55
Session
ppmNO
uvSmoke


Valids Notch 8 (5/7-5/8)
BNSF
NS
CSX
UP
NO (ppm)
Position
3000.0
2750.0
2500.0
2250.0
2000.0
1750.0
1500.0
1250.0
1000.0
750.0
500.0
250.0
0.0
3.000
2.750
2.500
2.250
2.000
1.750
1.500
1.250
1.000
0.750
0.500
0.250
0.000
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
ppmNO
MeanNO
uvSmoke
MeanSF


Valid (all notches) 5/7-5/8
BNSF
NS
CSX
UP
NO (ppm)
Position
ppmNO
MeanNO
uvSmoke
MeanSF
3500.0
3250.0
3000.0
2750.0
2500.0
2250.0
2000.0
1750.0
1500.0
1250.0
1000.0
750.0
500.0
250.0
0.0
3.500
3.250
3.000
2.750
2.500
2.250
2.000
1.750
1.500
1.250
1.000
0.750
0.500
0.250
0.000
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5


All Valids 5/9-5/10 (mostly notch 8)
UP
CSX
NS
AAR
NO (ppm)
2750.0
2500.0
2250.0
2000.0
1750.0
1500.0
1250.0
1000.0
750.0
500.0
250.0
0.0
3.000
2.750
2.500
2.250
2.000
1.750
1.500
1.250
1.000
0.750
0.500
0.250
0.000
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
Position
ppmNO
MeanNO
uvSmoke
MeanSF


All Valids 5/10-5/11
UP
CSX
NS
AAR
NO
Position
ppmNO
MeanNO
uvSmoke
MeanSF
3000.0
2750.0
2500.0
2250.0
2000.0
1750.0
1500.0
1250.0
1000.0
750.0
500.0
250.0
0.0
3.000
2.750
2.500
2.250
2.000
1.750
1.500
1.250
1.000
0.750
0.500
0.250
0.000
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5

Technical Issues

- “Hit Rate”/productivity: (primary risk issue for Phase 2)
  - For positions 2,3, and 4 obtained valid readings for only 30-40% of laps.
  - For Position 1, <20%.
  - Partial Explanations:
    - Loss of 1-hour for RSD maintenance at 00:30.
    - ~10% of records invalidated because of apparent “bounce” of optical train sensor.
    - Ground station fencing should have included a wind barrier.
  - Need to consider displacement “wind effects” generated by the train.

Technical Issues cont.

- Speed measurement subsystem (radar) was disabled/not evaluated. Was disabled because of occasional operating system crashes when connected. Failure of operating system after 1st night may imply the issue was not with the radar system. (Low risk issue for Phase 2).
- Gasoline generator reliability is still an issue. (Low risk issue for Phase 2).
- Night time video is still not acceptable/proven. (Medium risk issue for Phase 2).

Recommendations

- Proceed with Phase 2 deployment in Northern California:
  - Include some engineering contingency support to refine camera system and to identify/correct productivity issues in Roseville Yard and Weimar line haul sites.