Troubleshooting AutoGC Systems

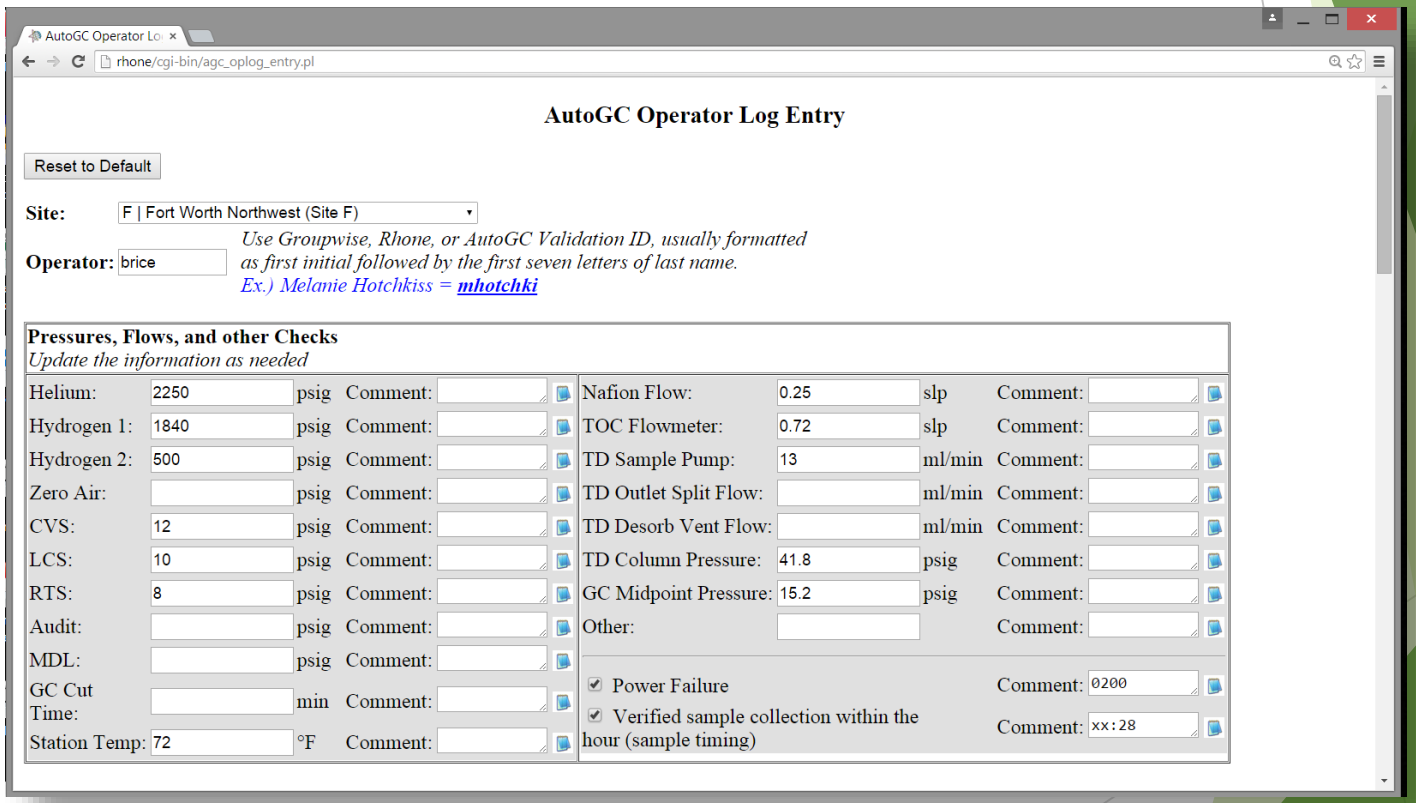
Jonathan. Meyer
carol@orsat.com

Orsat, LLC
www.orsat.com

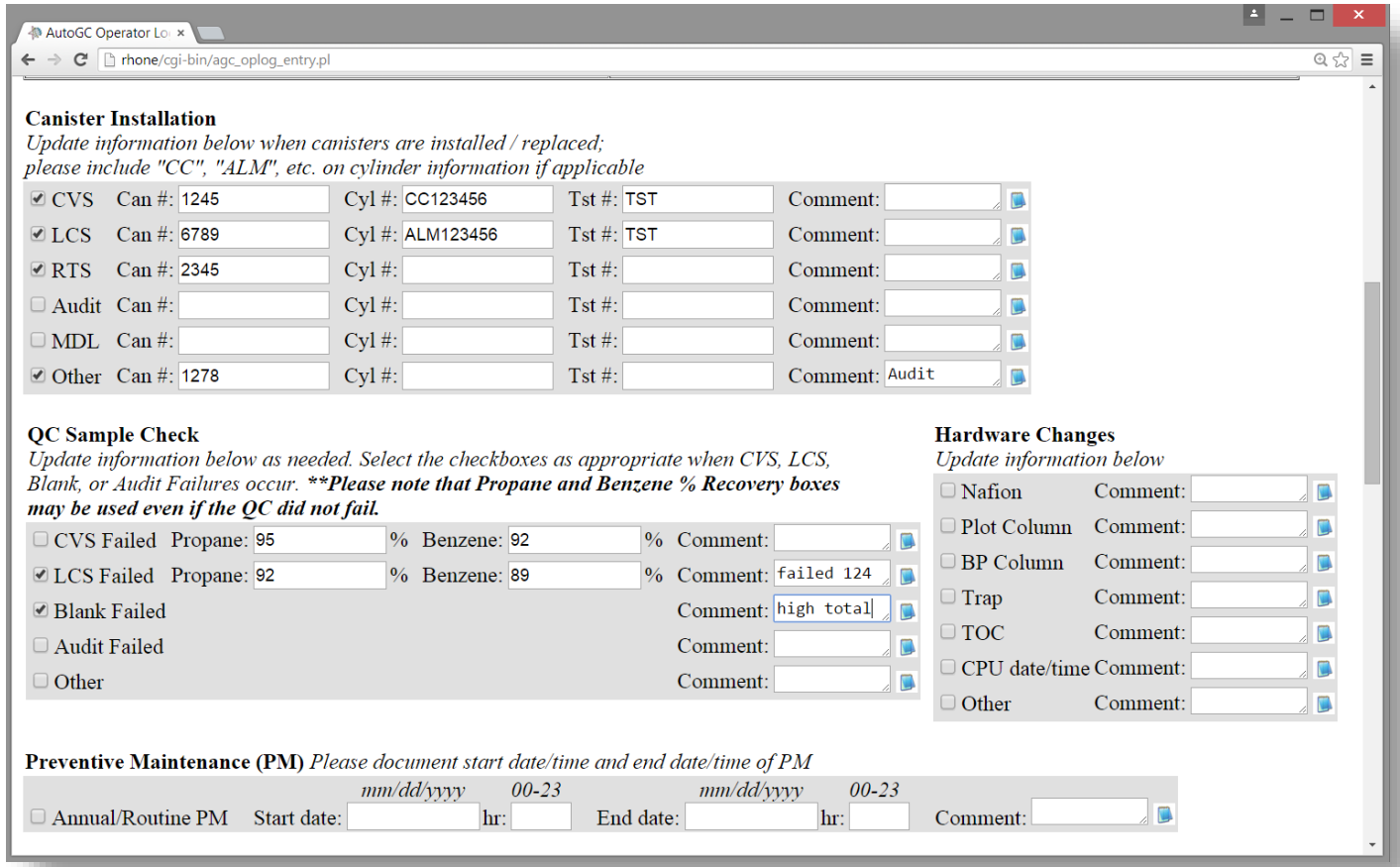
Using Rhone Web Pages
The Importance of Logbooks

- Recording Gas pressures and flows
  - Documents gas usage which can diagnose potential leaks in the system
  - Keeps system from running out of necessary support gases
  - Diagnose low recoveries when canisters get low or are changed
  - Diagnose some instrumental failure due to insufficient input pressures
- Recording system performance
  - QC standards
  - Changing response factors
  - Failures, error messages or lost data
- Recording method changes
  - Documenting the reprocessing of data
  - Changes in response factors from curves
- Less common documentation
  - Reasons for data loss
  - Unusual site activities
  - Manifold cleaning

Using Rhone Web Pages
The Importance of Logbooks



Using Rhone Web Pages
The Importance of Logbooks



Using Rhone Web Pages
The Importance of Logbooks

AutoGC Operator Lo

rhone/cgi-bin/agc_oplog_entry.pl

Blender Settings:

Update the information below as needed. Select the Reset checkboxes as appropriate when SPAN (or Zero) is reset. *****Please note that the "To" input box may be used to record current pressure even if the SPAN or ZERO was not reset.***

☑ Reset SPAN	From:	5.8	psig	To (current):	5.0	psig	Comment:
☑ Reset ZERO	From:	38.2	psig	To (current):	40.0	psig	Comment:
☐ New Blender Serial#							Comment:
☐ New Blend Ratio							Comment:
☐ Other							Comment:

Method & Sequence Optimization

Update the information below when a method/sequence is created or modified

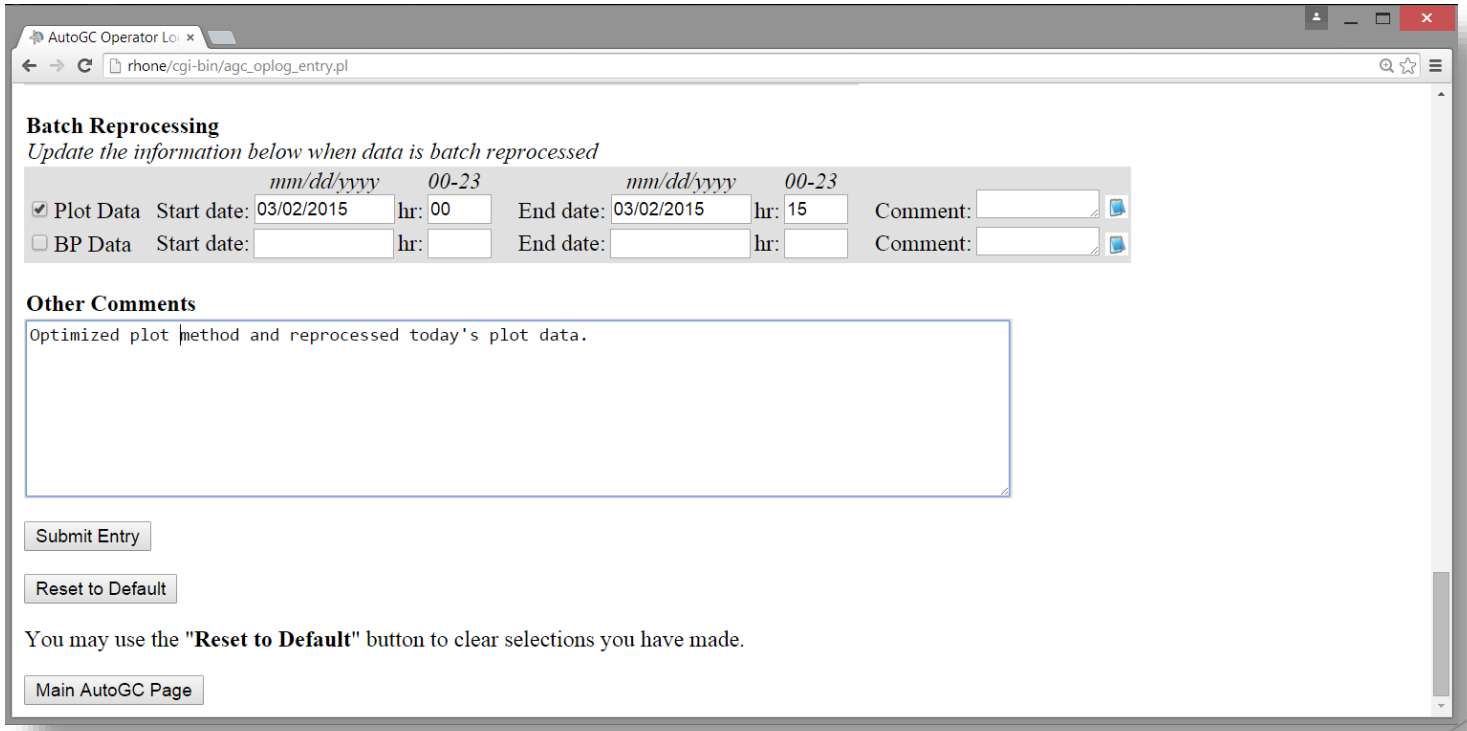
		mm/dd/yyyy	*00-23*		*mm/dd/yyyy*	*00-23*	
☑ New Sequence	Start dt:	03/02/2015	hr: 10	End dt:	03/26/2015	hr: 23	
☑ Plot Method							Comment: Plot
☑ BP-1 Method							Comment: BP Method
☑ Modified Sequence							Comment: setup RTS
☐ Other:							Comment:

Batch Reprocessing

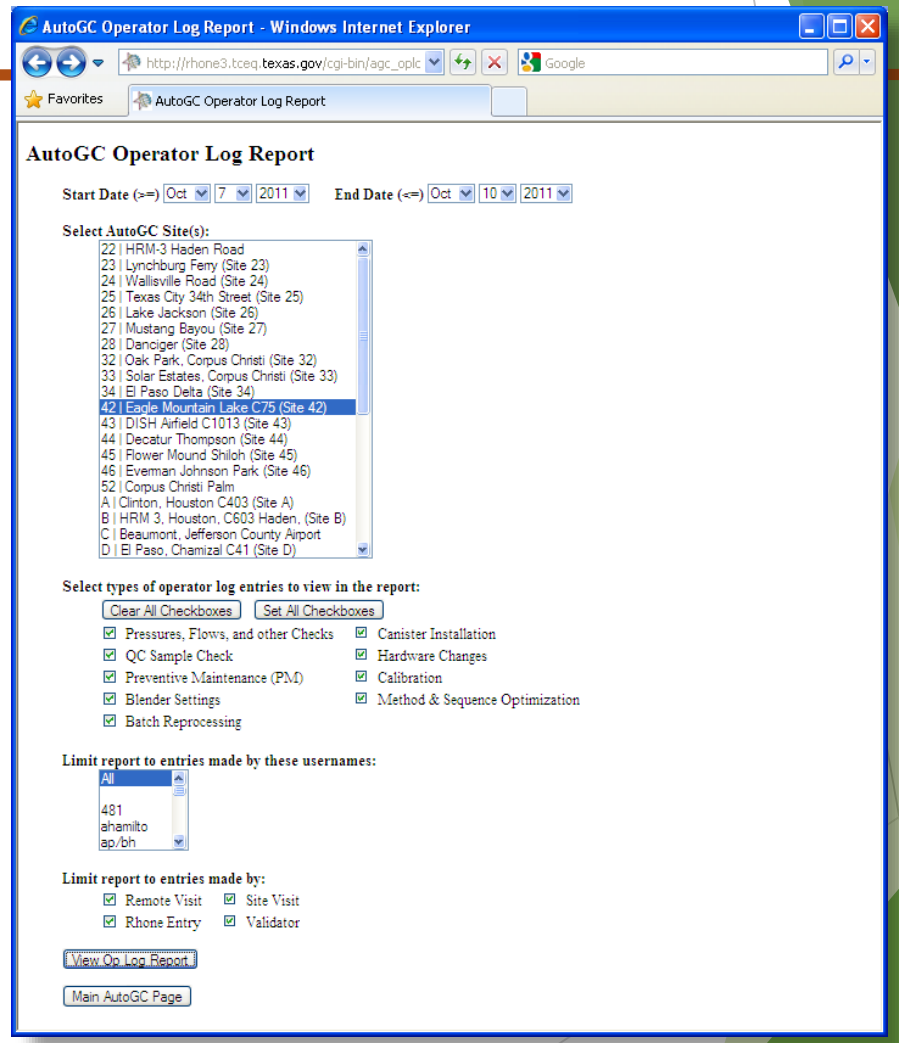
Update the information below when data is batch reprocessed

		mm/dd/yyyy	*00-23*		*mm/dd/yyyy*	*00-23*	
☐ Plot Data	Start date:		hr:	End date:		hr:	Comment:
☐ BP Data	Start date:		hr:	End date:		hr:	Comment:

Using Rhone Web Pages
The Importance of Logbooks



Using Rhone Web Pages
Logbook Review



Viewing Logbook allows filtering for specific types of information:

- Pressures
- QC checks
- Canister installation
- Calibrations

Using Rhone Web Pages
Logbook Review

Validators and Service techs use logs for troubleshooting failures

AutoGC Operator Log Report - Windows Internet Explorer

http://rhone3.tceq.texas.gov/cgi-bin/agc_oplog_rpt.pl

Favorites | AutoGC Operator Log Report

AutoGC Operator Log Report

Site	Date	Username	Source	Log Entry	Comment
42	10/10/2011 09:23	brice	Site Visit	**Pressures, Flows, and other Checks** *Verified Sample Timing:* [System is on time and correct row.] **QC Sample Check** *CVS:* Propane=104, Benzene=96 [42*CJ10B] *LCS:* Propane=101, Benzene=91 [42*EJ08V] **Method & Sequence Optimization** *Modified Sequence:* [Modified sequence to run an RTS later today.]	Propylene on Plot column is failing in the blanks due to some spiking causing high recoveries. BP column looks good. Will check on the RTS later today. Removed the 1,3 Butadiene MDL canister and re-installed RTS canister 37571.
42	10/07/2011 10:36	brice	Site Visit	**Pressures, Flows, and other Checks** *Helium:* 1150 psig [@60] *Hydrogen 1:* 200 psig [@71] *Hydrogen 2:* 450 psig [@70] *Zero Air:* 2650 psig [@84] *CVS:* 30 psig [37568] *LCS:* 10 psig [37567] *RTS:* 17 psig [37571] *MDL:* 23 psig *GC Cut Time:* 10.00 min *Nafion Flow:* 0.26 slp *TOC Flowmeter:* 0.47 slp *TD Sample Pump:* 13.0 ml/min *TD Column Pressure:* 41.7 psig *GC Midpoint Pressure:* 13.6 psig *Verified Sample Timing:* [System is on time and correct row.] **Canister Installation** *MDL:* 5117, CC65770 [Pre-run canister pressure: 23psi] **Blender Settings** *SPAN Reset:* *from* No Data psig *to* 5.0 psig *ZERO Reset:* *from* No Data psig *to* 40.0 psig **Method & Sequence Optimization** *Modified Sequence:* [Modified sequence to run an MDL tomorrow morning.]	Arrived on site and noticed the CVS can was at 2psi, could not locate any leaks but noticed valve 2 was still on. Refilled the can, Jonathan setup an LCS, CAL and Blank to run later today to check recoveries. Digi Router Signal Strength: 3 lights Minihelic II Pressure: 0.200 Will check blanks and cal run later.
42	10/07/2011 09:29	jmeyer	Remote Visit	**QC Sample Check** *CVS:* Failed Propane=59, Benzene=60 [42*CJ07C] **Method & Sequence Optimization** *Modified Sequence:* [Set up an LCS, cal and blank to verify morning cal results.]	Morning cal dropped to 50% for most components. No time change in files around cal run, blanks show some electronic spiking on channel A.

Site Visits and Rhone Logbook Entries

- Every visit remote or on site
- Record your observations of system performance
  - Important record for documenting problems
  - Helps with troubleshooting
  - Record as many parameters as possible
  - note any changes
- Don’t forget to check
  - System clock on time
  - Record any power failures
  - Note if TD drier is changing color

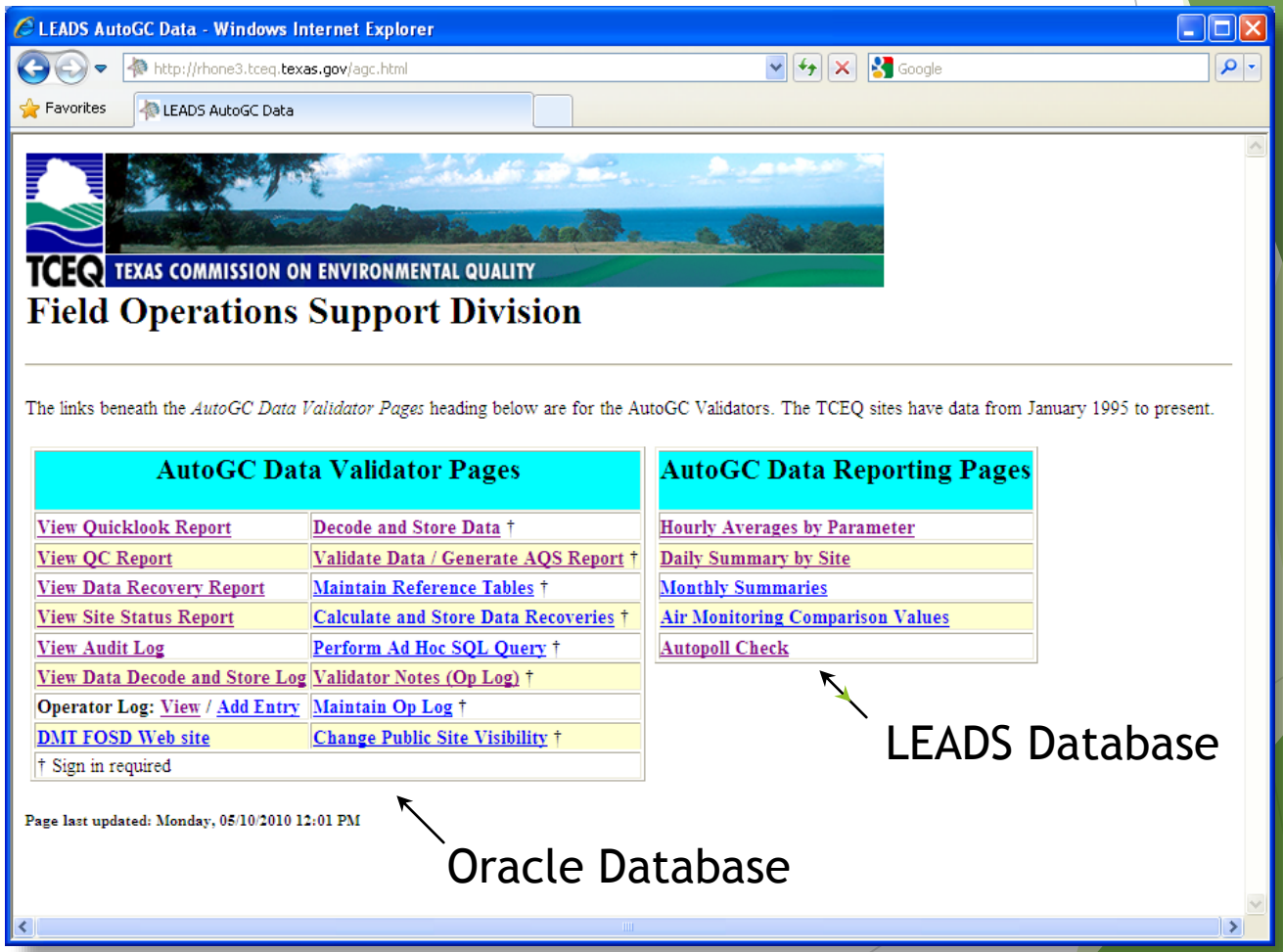
Checking Quality Controls

- The causes of failing QC checks should be evaluated as soon as they are noted.
  - Review chromatogram to determine if the failure resulted in the collection of ambient air
  - Check canister pressures and valves
  - Check blender set points
  - Check sample pump
  - Re-run QC run to confirm failure is systemic
- Common Failures
  - QC sample looks like ambient air
  - Blank failures
    - High propylene
    - High heavies from CVS
  - Low CVS recoveries
  - Low LCS recoveries

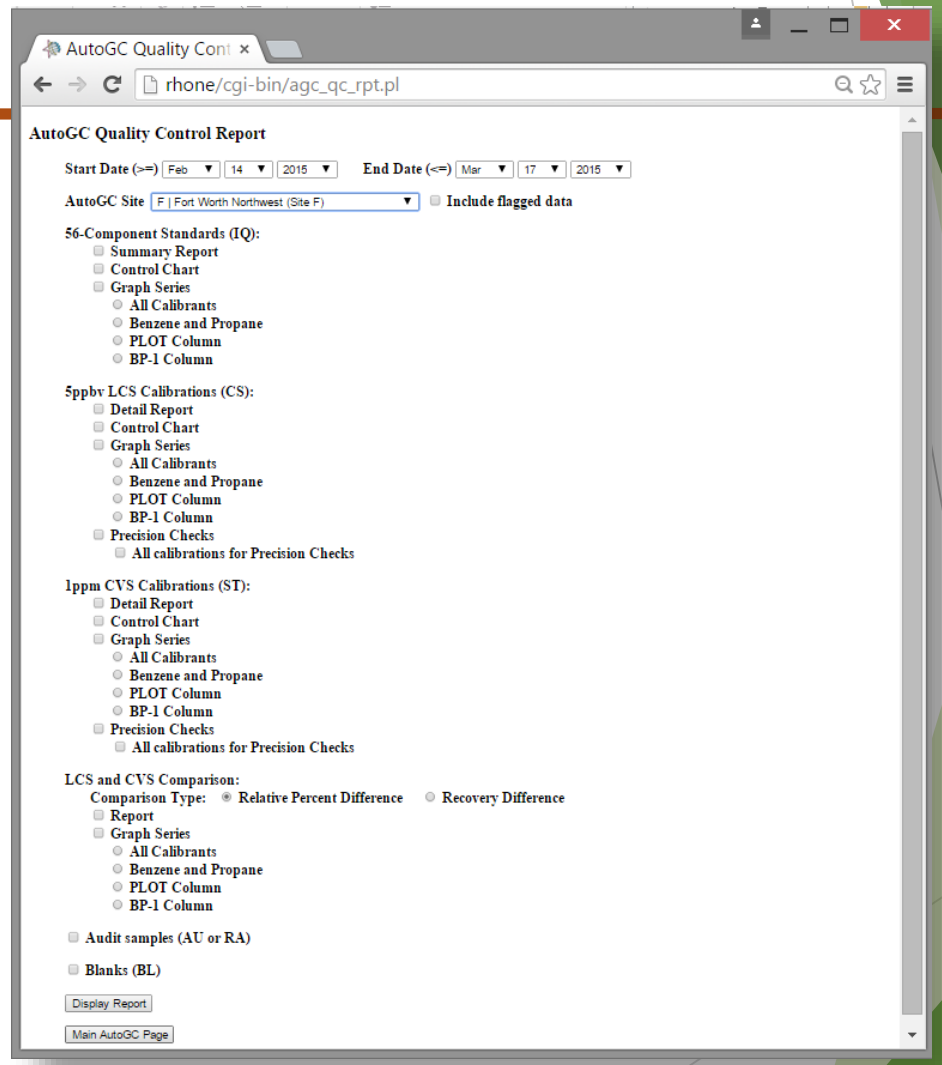
Using Rhone Web Pages
Quality Control Checks

Oracle Database
- Populated daily

LEADS Database
- Populated hourly



Using Rhone Web Pages Quality Control Checks



QC Checks loaded into the Oracle Database can be reviewed from the Validation Pages

Using Rhone Web Pages
Quality Control Checks

Retention Time Standard

- Run Weekly
- All targets should be identified

AutoGC Quality Cont ×

rhone/cgi-bin/agc_qc_rpt.pl

56-Component Standard Control Chart Report - Measurement Value (ppbC)

56-Component Standard Control Chart (ppbC) - Fort Worth Northwest (Site F) Date Range: 02/14/2015 - 03/14/2015					
Compound	Date and Hour				
	02/14/15 22:00	02/21/15 22:00	02/28/15 22:00	03/07/15 22:00	03/14/15 22:00
Ethane	1.9391	1.8905	1.8966	1.9055	2.0896
Ethylene	1.3481	1.3658	1.5552	1.5332	1.4114
Propane	2.9056	2.9085	2.7887	2.9589	3.0098
Propylene	1.4839	1.4917	1.4976	1.5714	1.5925
Isobutane	1.9294	2.0314	1.9435	1.9540	2.0092
n-Butane	3.1734	3.2104	3.1909	3.1907	3.3036
Acetylene	0.0000	0.0000	0.1642	0.0768	0.1389
t-2-Butene	1.9449	2.0051	1.9347	1.9624	1.9322
1-Butene	2.3079	2.3007	2.3170	2.3263	2.3424
c-2-Butene	2.7072	2.7429	2.7005	2.7963	2.7719
Cyclopentane	1.5662	1.5471	1.5119	1.5224	1.5821
Isopentane	3.0697	3.1318	3.0473	3.0630	3.1993
n-Pentane	2.0312	2.1074	1.9685	2.0164	2.1022
1,3-Butadiene	0.0889	0.1082	0.1634	0.0933	0.1043
t-2-Pentene	1.9222	1.9371	1.9008	1.9119	1.9327
1-Pentene	1.7878	1.7979	1.7153	1.7623	1.8578
c-2-Pentene	0.0000	2.4423	2.4332	2.3570	2.3681
2,2-Dimethylbutane	2.9812	2.9892	3.0884	3.0352	2.8942
Isoprene	1.9976	2.1113	2.0704	2.0515	2.1290

AutoGC Quality Cont ×

rhone/cgi-bin/agc_qc_rpt.pl

n-Hexane	2.1593	2.2752	2.2929	2.2325	2.1913
Methylcyclopentane	1.7632	1.8288	1.7289	1.7938	1.7915
2,4-Dimethylpentane	2.9472	3.2713	2.7965	2.9425	2.8767
Benzene	2.1358	2.1794	2.1798	2.0429	2.0398
Cyclohexane	2.9946	3.1577	2.9697	3.0703	3.1276
2-Methylhexane	1.5571	1.5805	1.5647	1.5706	1.5816
2,3-Dimethylpentane	3.6246	3.8935	3.9629	3.8513	3.7911
3-Methylhexane	1.8200	1.8388	1.7821	1.8225	1.9237
2,2,4-Trimethylpentane	2.1286	2.1873	2.0827	2.1876	2.2273
n-Heptane	1.8327	1.5832	1.5969	1.7403	1.7279
Methylcyclohexane	2.1914	2.1654	2.0895	2.0945	2.2292
2,3,4-Trimethylpentane	1.7036	1.7321	1.6863	1.6364	1.7144
Toluene	2.9603	3.0766	3.0058	2.9827	3.0229
2-Methylheptane	1.6124	1.7039	1.6524	1.6379	1.6303
3-Methylheptane	1.6540	1.6849	1.6784	1.6640	1.7011
n-Octane	2.0184	1.8904	1.8812	1.8793	1.9552
Ethyl Benzene	1.5953	1.6144	1.6437	1.6230	1.6530
p-Xylene + m-Xylene	2.7527	2.7562	2.7529	2.7552	2.7514
Styrene	1.9382	1.9170	1.8518	1.8714	1.8603
o-Xylene	1.4991	1.6055	1.4908	1.4903	1.4298
n-Nonane	1.5121	1.4288	1.4138	1.5521	1.4562
Isopropyl Benzene - Cumene	2.3702	2.3971	2.3358	2.4049	2.4018
n-Propylbenzene	2.3034	2.3191	2.2829	2.2937	2.3030
1,3,5-Trimethylbenzene	1.3865	1.3976	1.3701	1.3879	1.4158
1,2,4-Trimethylbenzene	2.3607	2.6473	2.6199	2.5897	2.5965
n-Decane	1.4891	1.4333	1.5115	1.4849	1.4170
1,2,3-Trimethylbenzene	1.3873	1.3254	1.2567	1.2530	1.2902

Using Rhone Web Pages
Quality Control Checks

CVS and LCS Standards Detail Report

AutoGC Quality Cont ×

rhone/cgi-bin/agc_qc_rpt.pl

5ppbv LCS Calibration Report (in ppbC)
Acquisiton Hour: 21
Raw File (P): FPEB21V.
Raw File (BP): FBEB21V.

Fort Worth Northwest (Site F)
Saturday, February 21, 2015

Compound	Column	Carbon No	Measured Value	Expected Value	% Recovery	Benz/Prop +-30.0% Others > 0.0
Ethane@	P	2	11.66	11.29	103.3	Pass
Propane@	P	3	16.62	16.77	99.1	Pass
n-Butane@	P	4	24.34	22.80	106.8	Pass
Acetylene@	P	2	9.46	11.73	80.7	Pass
n-Pentane@	P	5	30.34	29.59	102.5	Pass
1,3-Butadiene@	P	4	22.74	21.70	104.8	Pass
2-Methylpentane	P	6	34.91	33.21	105.1	Pass
n-Hexane@	BP	6	33.13	32.88	100.8	Pass
Benzene@	BP	6	33.56	33.21	101.1	Pass
Toluene@	BP	7	38.01	38.74	98.1	Pass
p-Xylene + m-Xylene@	BP	8	40.61	42.52	95.5	Pass
n-Propylbenzene@	BP	9	44.22	49.32	89.7	Pass
1,2,4-Trimethylbenzene@	BP	9	36.96	50.31	73.5	Pass

Total Unidentified VOCs, Column P: 4.5
Total Unidentified VOCs, Column BP: 60.9

LCS Cylinder#: ALM015462
Dilution: 0.00548

@ = Limited Target Compound

AutoGC Quality Cont ×

rhone/cgi-bin/agc_qc_rpt.pl

1ppm CVS Calibration Report (in ppbC)
Acquisiton Hour: 00
Raw File (P): FPCC17A.
Raw File (BP): FBCC17A.

Fort Worth Northwest (Site F)
Tuesday, March 17, 2015

Compound	Column	Carbon No	Measured Value	Expected Value	% Recovery	Benz/Prop +-25.0% Others +-45.0%
Ethane@	P	2	8.34	8.59	97.1	Pass
Propane@	P	3	13.00	12.27	105.9	Pass
n-Butane@	P	4	18.19	16.52	110.1	Pass
Acetylene@	P	2	6.31	8.59	73.4	Pass
n-Pentane@	P	5	21.79	20.05	108.7	Pass
1,3-Butadiene@	P	4	18.05	16.69	108.2	Pass
2-Methylpentane	P	6	25.26	24.30	103.9	Pass
n-Hexane@	BP	6	25.25	25.03	100.9	Pass
Benzene@	BP	6	25.44	25.03	101.6	Pass
Toluene@	BP	7	28.26	29.77	94.9	Pass
p-Xylene + m-Xylene@	BP	8	30.59	34.34	89.1	Pass
n-Propylbenzene@	BP	9	34.11	37.18	91.7	Pass
1,2,4-Trimethylbenzene@	BP	9	28.64	37.91	75.5	Pass

Total Unidentified VOCs, Column P: 8.9
Total Unidentified VOCs, Column BP: 45.5

Cylinder#: cc267341
Blender Ratio: 0.00405

@ = Limited Target Compound

Using Rhone Web Pages
Quality Control Checks

CVS Control Chart

AutoGC Quality Cont ×

rhone/cgi-bin/agc_qc_rpt.pl

CVS Control Chart Report - Percent Recoveries

CVS Control Chart - Fort Worth Northwest (Site F) Date Range: 03/08/2015 - 03/17/2015												
Compound	Date and Hour											
	03/08/15 00:00	03/08/15 01:00	03/09/15 02:00	03/10/15 00:00	03/11/15 00:00	03/12/15 02:00	03/13/15 00:00	03/14/15 02:00	03/15/15 00:00	03/15/15 01:00	03/16/15 02:00	03/17/15 00:00
Ethane@	96.7	98.1	97.6	96.9	96.5	97.9	98.7	93.8	96.3	97.5	95.7	97.1
Propane@	102.7	101.4	104.2	99.9	103.6	102.5	104.7	102.0	104.7	102.9	104.1	105.9
n-Butane@	107.6	107.5	109.2	107.9	109.6	109.1	109.9	109.3	108.9	110.2	109.6	110.1
Acetylene@	74.0	74.9	0.0	71.9	73.7	73.7	74.7	70.9	70.5	72.4	74.1	73.4
n-Pentane@	106.5	106.2	107.6	106.0	110.1	107.2	108.9	106.5	109.3	107.6	108.3	108.7
1,3-Butadiene@	104.1	104.4	106.7	105.1	106.9	105.8	107.2	105.4	106.4	106.9	107.6	108.2
2-Methylpentane	105.5	105.7	104.5	102.0	104.5	103.2	104.5	102.7	103.3	103.3	104.4	103.9
n-Hexane@	98.5	98.5	99.4	97.3	100.3	98.9	100.8	97.6	99.4	99.1	99.8	100.9
Benzene@	97.3	99.1	99.2	97.9	100.4	97.5	101.5	97.6	98.1	100.8	98.7	101.6
Toluene@	93.9	94.2	93.7	92.9	94.7	94.1	95.7	93.5	94.5	94.2	93.6	94.9
p-Xylene + m-Xylene@	87.9	89.8	87.6	87.9	89.4	87.7	90.0	87.0	88.8	90.0	88.2	89.1
n-Propylbenzene@	91.8	92.4	90.4	91.3	92.7	91.2	91.4	91.0	92.0	93.2	91.1	91.7
1,2,4-Trimethylbenzene@	77.1	79.6	71.4	71.7	72.9	73.8	75.2	73.8	78.4	81.5	76.5	75.5

Using Rhone Web Pages Quality Control Checks

Blank Control Chart

AutoGC Quality Cont

rhone/cgi-bin/agc_qc_rpt.pl

AutoGC Blank Report

Fort Worth Northwest (Site F) Date Range: 03/01/2015 - 03/17/2015			
Date	**Hour**	**Test Result**	**Compounds greater than 2.0 ppbC and TNMHC greater than 20.0**
03/01/2015	04	Pass	
03/02/2015	01	Pass	
03/03/2015	03	Pass	
03/04/2015	01	Pass	
03/05/2015	03	Pass	
03/06/2015	01	Pass	
03/07/2015	03	Pass	
03/08/2015	02	Pass	
03/09/2015	03	Pass	
03/10/2015	01	Pass	
03/11/2015	01	Pass	
03/12/2015	03	Pass	
03/13/2015	01	Pass	
03/14/2015	03	Pass	
03/15/2015	02	Pass	
03/16/2015	03	Pass	
03/17/2015	01	Pass	

Using Rhone Web Pages
Data Collection – Is it running?

LEADS AutoGC Data - Windows Internet Explorer

http://rhone3.tceq.texas.gov/agc.html

Favorites | LEADS AutoGC Data

TCEQ TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Field Operations Support Division

The links beneath the *AutoGC Data Validator Pages* heading below are for the AutoGC Validators. The TCEQ sites have data from January 1995 to pre

AutoGC Data Validator Pages		AutoGC Data Reporting Pages
View Quicklook Report	Decode and Store Data †	Hourly Averages by Parameter
View QC Report	Validate Data / Generate AQS Report †	Daily Summary by Site
View Data Recovery Report	Maintain Reference Tables †	Monthly Summaries
View Site Status Report	Calculate and Store Data Recoveries †	Air Monitoring Comparison Values
View Audit Log	Perform Ad Hoc SQL Query †	Autopoll Check
View Data Decode and Store Log	Validator Notes (Op Log) †	
Operator Log: View / Add Entry	Maintain Op Log †	
DMT FOSD Web site	Change Public Site Visibility †	
† Sign in required		

Page last updated: Monday, 05/10/2010 12:01 PM

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Calibrations | Air Quality Maps | Data Reports | AutoGC | Water Data | Comms | Log Files | Configuration | Site Info

AutoGC Autopoll Check

Select an allowable time window: 2 Hours

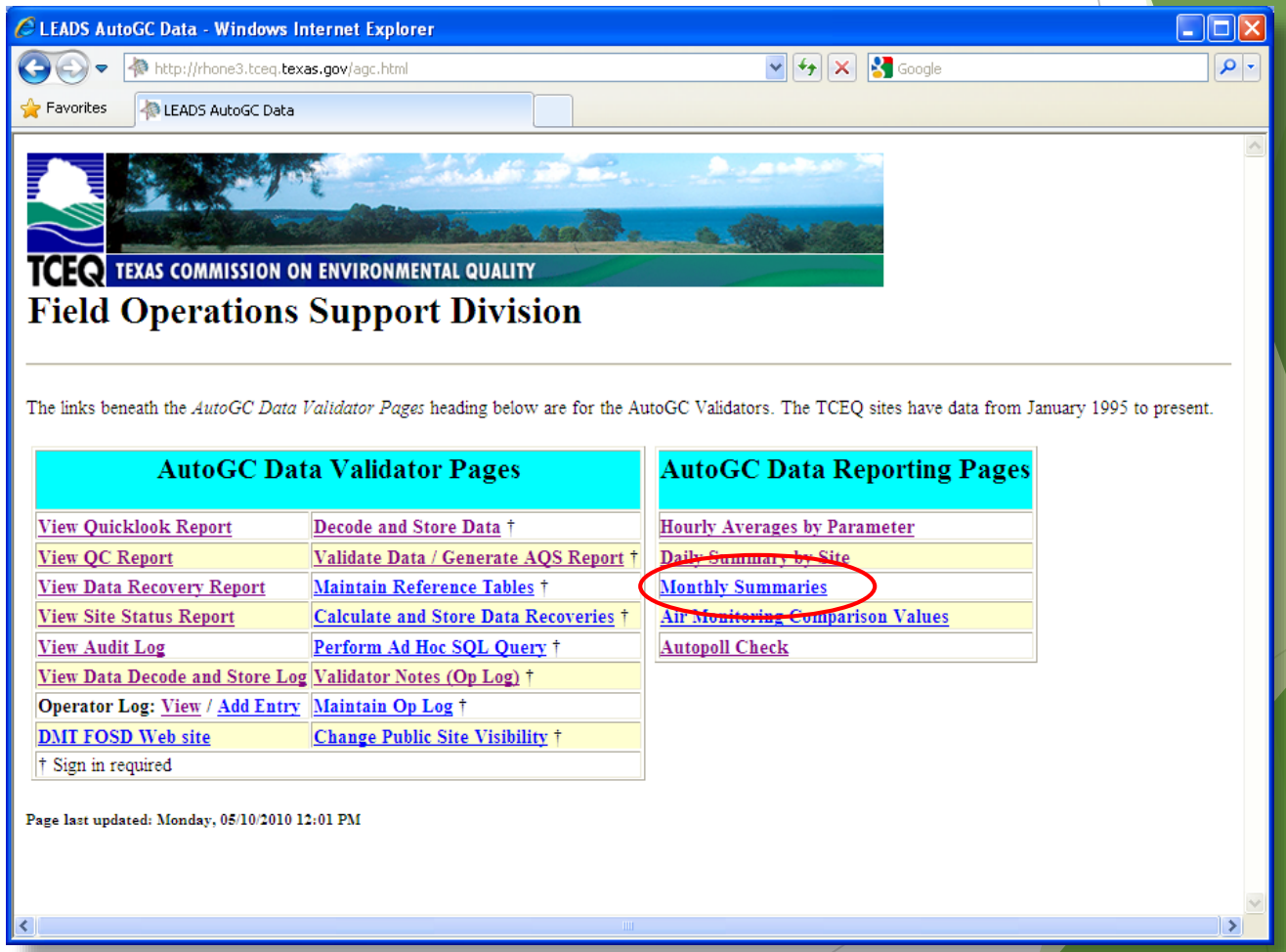
Generate Report

Report Generated: September 09, 2018 08:18:39 pm CDT

Area	Site	Status
Houston-Galveston-Brazoria		
	Danciger [28]	Current (2 hours)
	Lake Jackson [26]	Overdue 3 hours
	Oyster Creek [29]	Overdue 3 hours
	Texas City 34th St. [25]	Current (2 hours)
	Channelview [R]	Current (2 hours)
	Galena Park A167 [53][72]	Overdue 3 hours
	Houston Milby Park A169 [K]	Current (2 hours)
	Wallisville Road [24]	Overdue 3 hours
	HRM-3 Haden Road [B] [22]	Current (2 hours)
	Lynchburg Ferry [23]	Overdue more than 25 hours
	Clinton [A]	Current (2 hours)
	Hou.DeerPrk2	Current (2 hours)
	Cesar Chavez [V]	Current (2 hours)
Beaumont-Port Arthur		
	Beaumont-Downtown [Z]	Current (2 hours)
	Nederland High School [Y]	Overdue more than 25 hours
El Paso-Juarez		
	Chamizal [D]	Current (1 hours)
	El Paso Delta [34]	Current (2 hours)
Dallas-Fort Worth		
	Dallas Hinton St. [E]	Overdue more than 25 hours
	Dallas Elm Fork [2C]	Current (2 hours)
	Flower Mound Shiloh [45] [2F]	Current (2 hours)
	Dish Airfield [43] [2D]	Current (2 hours)
	Mansfield Flying L Lane [63]	Current (2 hours)
	Godley FM2331 [2G]	Current (2 hours)
	Eagle Mountain Lake [42] [2E]	Current (2 hours)
	Ft. Worth Northwest (Meacham) [F]	Overdue 3 hours
	Everman Johnson Park [46] [2J]	Current (2 hours)
	Arlington UT Campus [2A]	Current (2 hours)
	Kennedale Treepoint Dr [62]	Current (2 hours)
	Fort Worth Joe B Rushing Road [65]	Current (2 hours)
	Fort Worth Benbrook Lake [2B]	Current (2 hours)
	Decatur Thompson [44] [2T]	Current (2 hours)
	Rhome Seven Hills Road [64]	Current (2 hours)
San Antonio		
	Camp Bullis [54]	Current (2 hours)
	Karnes County [36]	Current (2 hours)
	Floresville Hospital Blvd [35]	Current (2 hours)
Corpus Christi-Victoria		
	Corpus Christi Palm [52]	Current (2 hours)

A status of "Current" indicates data has been received within the last 2 hours.

Using Rhone Web Pages
Data Collection – Is it running?



Using Rhone Web Pages
Data Collection – Is it running?

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Calibrations | Air Quality Maps | Data Reports | AutoGC | Water Data | Comms | Log Files | Configuration | Site Info

Dallas Hinton St. [E] Monthly Summary

Air Monitoring Comparison Values (AMCVs) are used to evaluate the potential for effects to occur as a result of exposure to concentrations of constituents in the air. AMCVs are based on data concerning health effects, odor, and vegetation effects. They are not ambient air standards. If predicted or measured airborne levels of a constituent do not exceed the comparison level, adverse health or welfare effects would not be expected to result. If ambient levels of constituents in air exceed the comparison levels, it does not necessarily indicate a problem, but rather, triggers a more in-depth review. If you have any questions about the potential for health, odor, or vegetation effects from exposure to the reported concentrations please contact the Toxicology Section by telephone at (512) 239-3900 or by email at tox@tceq.texas.gov.

Use the controls below to select a different date or site. Click on the Generate Report button once you have made your selections.

Select a Month: September ▼ 2018 ▼ **Select a Site:** Dallas Hinton St. [E] ▼ **Measured in:** ○ ppb-Volume ◉ ppb-Carbon

Air Monitoring Comparison Value Highlights: ☐ Odor ☐ Short-Term Vegetation ☐ Short-Term Health (if defined for a particular parameter)

Report Format: ◉ Tabular (webified) ○ Comma-delimited

Emulate WWW: ☐ <-- This only appears on internal pages

Generate Report

The table(s) below contains hourly averages for **Saturday, September 1, 2018**. All times shown are in Local Standard Time regardless of Daylight Savings Time Observance. A target list of analytes (compounds) and Air Monitoring Comparison Values (AMCV) can be found at http://www.tceq.texas.gov/implementation/tox/AirToxics.html#amcv. It is scientifically appropriate to compare one-hour auto-GC data to the short-term AMCV. The long-term AMCV is used to evaluate the average concentration one is exposed to over a lifetime. It is not scientifically appropriate to use the long-term AMCV to evaluate one-hour concentrations. Individual concentrations that are below the short-term AMCV but above the long-term AMCV do not necessarily indicate a health risk. All the individual measurements collected over the course of at least a year are averaged for comparison to the long-term AMCV.

September 2018						Propane (POC 3) measured in parts per billion - Carbon														Local Standard Time					
Day	Morning												Afternoon												Day
	Mid	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	Noon	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	
	x.xx	Only green underlined data has been validated.																							
1	3.37	4.23	ST	BL	6.26	7.58	8.27	**8.87**	7.74	5.08	3.92	3.69	2.33	2.54	2.34	2.50	2.88	3.68	4.01	4.22	3.65	CS	IQ	2.56	1
2	ST	ST	BL	3.68	4.19	5.01	5.80	7.14	**7.40**	5.79	4.11	2.51	2.52	2.08	2.27	1.92	2.82	3.76	3.18	2.89	2.09	2.44	1.76	1.96	2
3	2.79	2.94	ST	BL	4.57	3.55	3.24	**4.82**	4.32	4.00	2.34	1.59	2.25	2.67	2.68	3.31	3.04	4.64	4.31	4.29	3.21	2.87	2.90	3.02	3
4	ST	BL	2.15	2.76	3.99	**6.21**	5.57	5.31	4.59	5.16	4.38	2.62	2.48	2.61	2.24	1.99	2.04	2.06	2.12	2.31	2.44	3.05	3.55	3.13	4
5	2.97	3.38	ST	BL	4.51	5.48	5.89	**6.53**	5.29	5.39	4.67	4.28	4.96	3.48	3.68	2.31	2.86	4.31	4.14	3.97	4.30	3.20	3.33	4.74	5
6	ST	BL	8.35	9.01	9.94	12.86	15.04	**17.12**	15.16	16.60	16.88	13.02	8.82	5.23	4.69	9.05	4.26	5.32	5.11	5.30	5.87	6.02	6.23	5.61	6
7	12.15	13.67	ST	BL	16.07	20.01	**26.71**	26.06	20.60	15.37	11.39	10.69	6.00	4.34	3.73	4.92	3.00	7.15	8.86	10.26	11.66	10.00	7.22	5.54	7
8	ST	BL	5.74	**9.75**	5.15	4.39	5.25	7.50	LST	LST	LST	LST	LST	LST	LST	LST	LST	LST	LST	LST	LST	LST	LST	LST	8
9	LST	LST	LST	LST	LST	LST	LST	LST	LST	LST	LST	LST	LST	LST	LST	LST	NA	NA	NA	NA	NA				9
	x.xx	Only green underlined data has been validated.																							
	Currently, the Limit of Detection (LOD) applied to all AutoGC target compounds is 0.4 ppb-C.																								
	Maximum values for the day are **bold** within the table.																								
	There is no Odor Air Monitoring Comparison Value established for Propane.																								
	There is no Short-Term Vegetation Air Monitoring Comparison Value established for Propane.																								

Using Rhone Web Pages
Data Collection – Is it running?

LEADS AutoGC Data - Windows Internet Explorer

http://rhone3.tceq.texas.gov/agc.html

Favorites | LEADS AutoGC Data

TCEQ TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Field Operations Support Division

The links beneath the *AutoGC Data Validator Pages* heading below are for the AutoGC Validators. The TCEQ sites have data from Janua

AutoGC Data Validator Pages		AutoGC Data Reporting Pages
View Quicklook Report	Decode and Store Data †	Hourly Averages by Parameter
View QC Report	Validate Data / Generate AQS Report †	Daily Summary by Site
View Data Recovery Report	Maintain Reference Tables †	Monthly Summaries
View Site Status Report	Calculate and Store Data Recoveries †	Air Monitoring Comparison Values
View Audit Log	Perform Ad Hoc SQL Query †	Autopoll Check
View Data Decode and Store Log	Validator Notes (Op Log) †	
Operator Log: View / Add Entry	Maintain Op Log †	
DMT FOSD Web site	Change Public Site Visibility †	
† Sign in required		

Page last updated: Monday, 05/10/2010 12:01 PM

Quicklook Report Summary Page — **Fort Worth Northwest (Site F), Thursday, September 6, 2018**

Flag	Hour	Sample Type	BP File Name	Reprocess Date	# Missing Targets	PL File Name	Reprocess Date	# Missing Targets	TNMHC	Total Unid	Wind Spd (mph)	Wind Dir (deg)
Pass	00	ST	FBCI06A.		16	FPCI06A.		7	364.0	89.5		
Pass	01	BL	FBBI06B.		21	FPBI06B.		15	3.1	1.4		
	02	AM	FBSI06C.		3	FPSI06C.			87.7	7.2		
	03	AM	FBSI06D.		3	FPSI06D.			123.1	9.1		
	04	AM	FBSI06E.		4	FPSI06E.			146.8	8.6		
	05	AM	FBSI06F.		3	FPSI06F.			140.3	11.3		
	06	AM	FBSI06G.		2	FPSI06G.			166.1	11.5		
	07	AM	FBSI06H.		6	FPSI06H.		3	78.9	4.5		
	08	AM	FBSI06I.		14	FPSI06I.		4	30.1	2.0		
	09	AM	FBSI06J.		13	FPSI06J.		6	28.1	1.7		
	10	AM	FBSI06K.		18	FPSI06K.		6	16.9	1.6		
	11	AM	FBSI06L.		21	FPSI06L.		7	14.1	1.3		
	12	AM	FBSI06M.		21	FPSI06M.		5	17.3	1.4		
	13	AM	FBSI06N.		15	FPSI06N.		5	22.6	1.8		
	14	AM	FBSI06O.		7	FPSI06O.		2	38.2	2.5		
	15	AM	FBSI06P.		9	FPSI06P.		2	26.2	3.0		
	16	AM	FBSI06Q.		3				10.6	2.0		
	17	AM	FBSI06R.		2	FPSI06R.			69.3	12.1		
	18	AM	FBSI06S.		3	FPSI06S.			59.4	8.0		
	19	AM	FBSI06T.		3	FPSI06T.			77.4	9.4		
	20	AM	FBSI06U.		3	FPSI06U.		1	59.1	6.9		
	21	AM	FBSI06V.		2	FPSI06V.		1	53.6	5.6		
	22	AM	FBSI06W.		3	FPSI06W.		1	56.0	5.7		
	23	AM	FBSI06X.		2	FPSI06X.		1	77.1	9.2		

% Recoveries — **CVS Failures** — **Blank Compounds > 2.0 ppbC**

00:00 Benz 106.9 Prop 109.4

Std Cyl: cc344433a, 0.00405
LCS Cyl: AAL3439, 0.00548

* - more failed compounds exist + - more failed hours exist

Troubleshooting Failures

No Data – AutoGC is Not Running Totalchrom Errors

- Not Ready - No Method
  - Power failure has interrupted connection between Totalchrom and the interface
    - NCI902 interfaces can be backed up to eliminate this for momentary power outages
    - Integral interface in GC cannot be backed up.
- Port Comm error
  - May be the result of a power failure
  - Sometimes the result of operator activity on computer during Totalchrom activities
  - Requires refresh of configuration
- End of Sequence
  - System stops at midnight

No Data – AutoGC is Not Running Turbomatrix Errors

- If possible check the TD log before resetting the TD
- System Faults
  - Air pressure too low
  - Carrier pressure too low
- Peltier at -58ºC
  - Peltier at -58ºC - Heated zones have shut down
  - Valco valve A failure
  - Oven position error
  - Duty cycle errors
- TD Ready to Inject
  - Check to see why GC is not ready
  - Check to see that Totalchrom is ready.

No Data – AutoGC is Not Running
GC Errors

- One or both FIDs are not lit
  - Only applies to PPC FID GCs
  - Check H2 and air sources
- Oven PRT error on GC
  - Reset GC – could be the result of poor power failure
  - Call Orsat if this continues to happen
- GC fails to reach starting temperature
  - Trailer is too hot, check AC
  - Check TD log for deviations
- TD does not recognize that GC is ready
  - Check Ready out signal cable from GC to TD
- GC shows Not Ready – EXT (NCI902 interface only)
  - Check IF ready out cable to GC Ready In
- TD and GC are running but Totalchrom is not collecting data
  - Check GC start out cable to NCI902 Interface start in.

Factors Affecting Data Validity

- Timing Issues resulting in invalid data
- Sampling Issues
  - Ambient data which appears suspect
  - May or may not be associated with failing QC
- Chromatographic Issues
  - Baselines
  - Noise
  - Contamination
- Failing QC
  - CVS and LCS standards
  - RTS spikes
  - Blanks

Causes of Invalid Sampling Times

- Power failures
  - Vigilance during rainy periods
  - Using Smart home switches to reset TD
  - Using Totalchrom to reset timing
- Creeping sample times
  - Check TD log
    - Deviation – GC not Ready
    - Duty cycle errors
  - Peltier not cooling to -30 in a timely fashion
  - Trailer too warm

Valid Sample Timing

Name	Date Modified	Size	Type
RPSD07K.raw	4/7/2009 10:48	2 KB	TotalChrom Raw File
RBSD07K.raw	4/7/2009 10:48	2 KB	TotalChrom Raw File
RBSD07J.TX0	4/7/2009 10:36	3 KB	TX0 File
RBSD07J.rst	4/7/2009 10:36	18 KB	TotalChrom Result File
RPSD07J.TX0	4/7/2009 10:36	3 KB	TX0 File
RPSD07J.rst	4/7/2009 10:36	19 KB	TotalChrom Result File
RPSD07J.raw	4/7/2009 10:36	36 KB	TotalChrom Raw File
RBSD07J.raw	4/7/2009 10:36	36 KB	TotalChrom Raw File
RBSD07I.TX0	4/7/2009 09:36	3 KB	TX0 File
RBSD07I.rst	4/7/2009 09:36	21 KB	TotalChrom Result File
RPSD07I.TX0	4/7/2009 09:36	3 KB	TX0 File
RPSD07I.rst	4/7/2009 09:36	20 KB	TotalChrom Result File
RPSD07I.raw	4/7/2009 09:36	36 KB	TotalChrom Raw File
RBSD07I.raw	4/7/2009 09:36	36 KB	TotalChrom Raw File
RBSD07H.TX0	4/7/2009 08:36	4 KB	TX0 File
RBSD07H.rst	4/7/2009 08:36	24 KB	TotalChrom Result File
RPSD07H.TX0	4/7/2009 08:36	3 KB	TX0 File
RPSD07H.rst	4/7/2009 08:36	20 KB	TotalChrom Result File

DTS between
xx:28 – xx:48

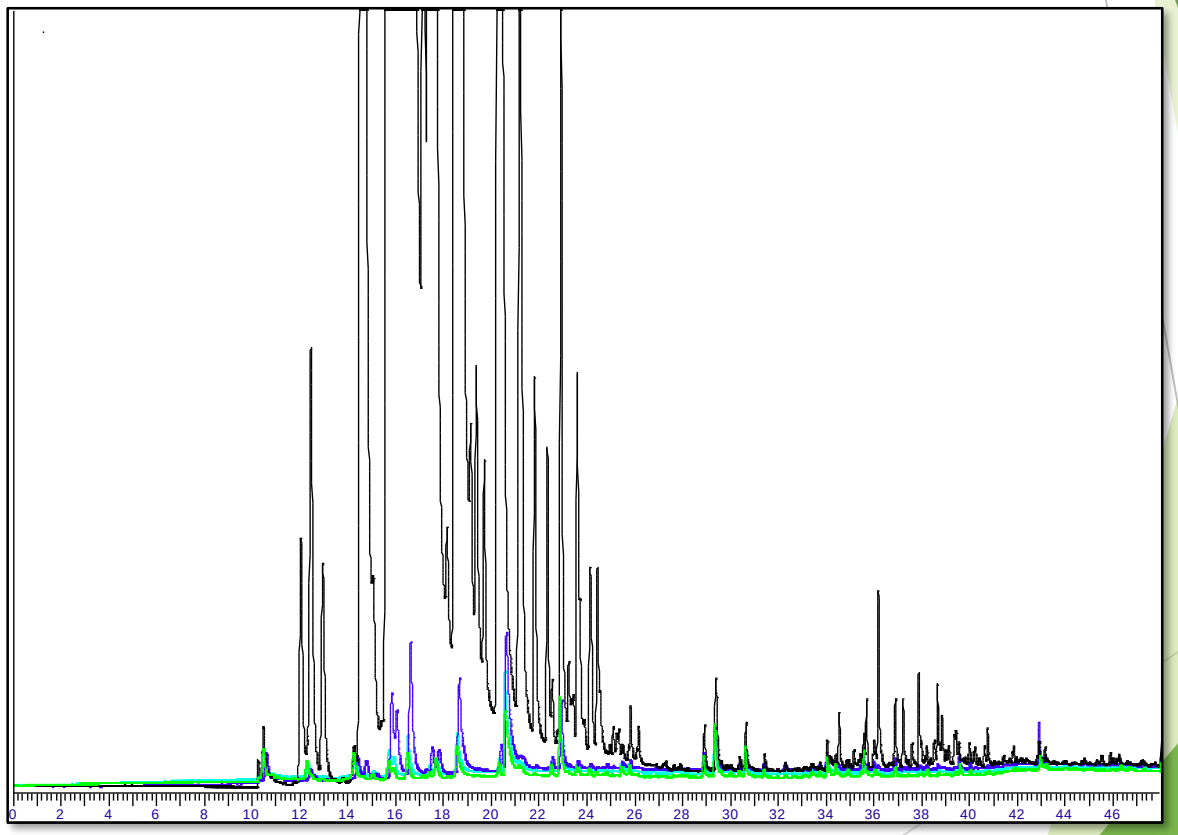
Stability should be < 1 minute change per day – requires resetting TD every 20 days

Review Ambient Data
Issues related to invalid ambient data

- Unusually low levels or inconsistent levels which are not associated with met changes
- Examples:
  - All ambient look like blanks
  - All ambient look like CVS or partial CVS
  - Contamination
- Checks
  - Sample pump and sample flow on TD
  - Manifold fan motor operational
  - DVI's on rear of TD have power (should be battery backed up)
  - Use Hands-on in Totalchrom to check blender valve functionality (relay 5 reset)

Chromatographic Issues
Contamination

Contamination of BP Chromatogram from Piston Flow measurement of Sample Flow on Turbomatrix



Chromatographic Issues
Baselines

- Flat Baselines
  - Check FID's are lit
  - Check FID connections to IF
  - Check AZ set to ON on GC
  - Check ATTN and Range on GC at 1
- Wavy (rolling) Baselines
  - Insure AC not disturbing FID's
  - Check Compressor and inline air regulator settings
  - Check Zero Air pressure and change filter if necessary
  - Check or change GC air regulator
- Ramping Baselines
  - Replace FID ferrule for offending column
  - Possible damaged detector (see noise)

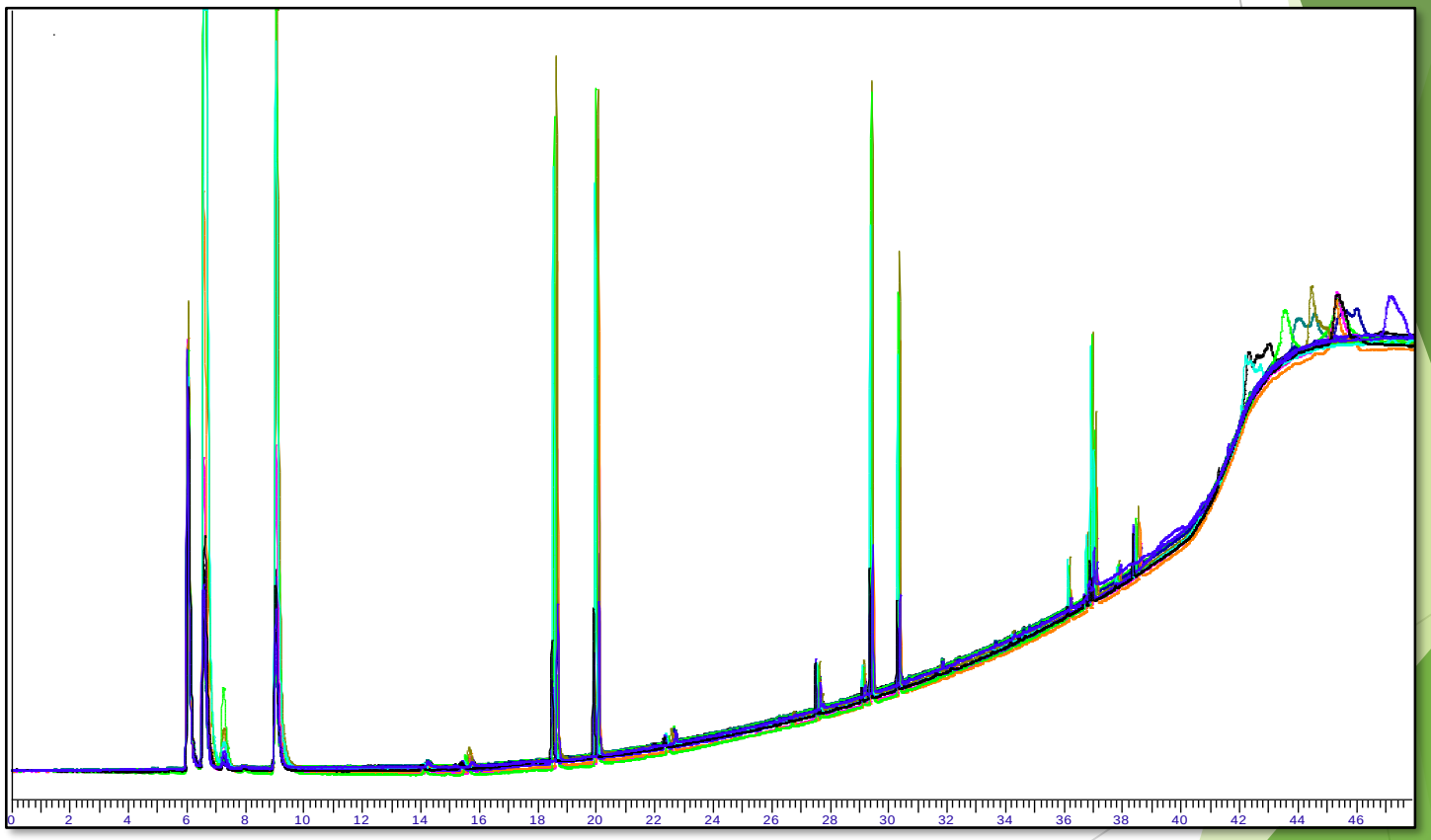
Beware of Auto scaling!

Chromatographic Issues
Spikes, ticks, noise and other humpy-do's

- Excessive moisture can cause particulate release on PLOT columns
- Dirty or "wet" detectors can cause excessive noise and must be cleaned or parts replaced
- Sawtooth pattern is often associated with replacement of H2 cylinders – exercise GC regulators and cylinder regulator.
- Vibrations such as opening and closing doors or compressors starting and stopping can cause spikes – check that detector collectors are tight and GC lid is screwed down
- Spikes related to heaters or other equipment must be determined by finding the source – sometimes related to poor connections on the IF
- Some excursions, dips and such are associated with compressor cycling and must be determined by association and observation.

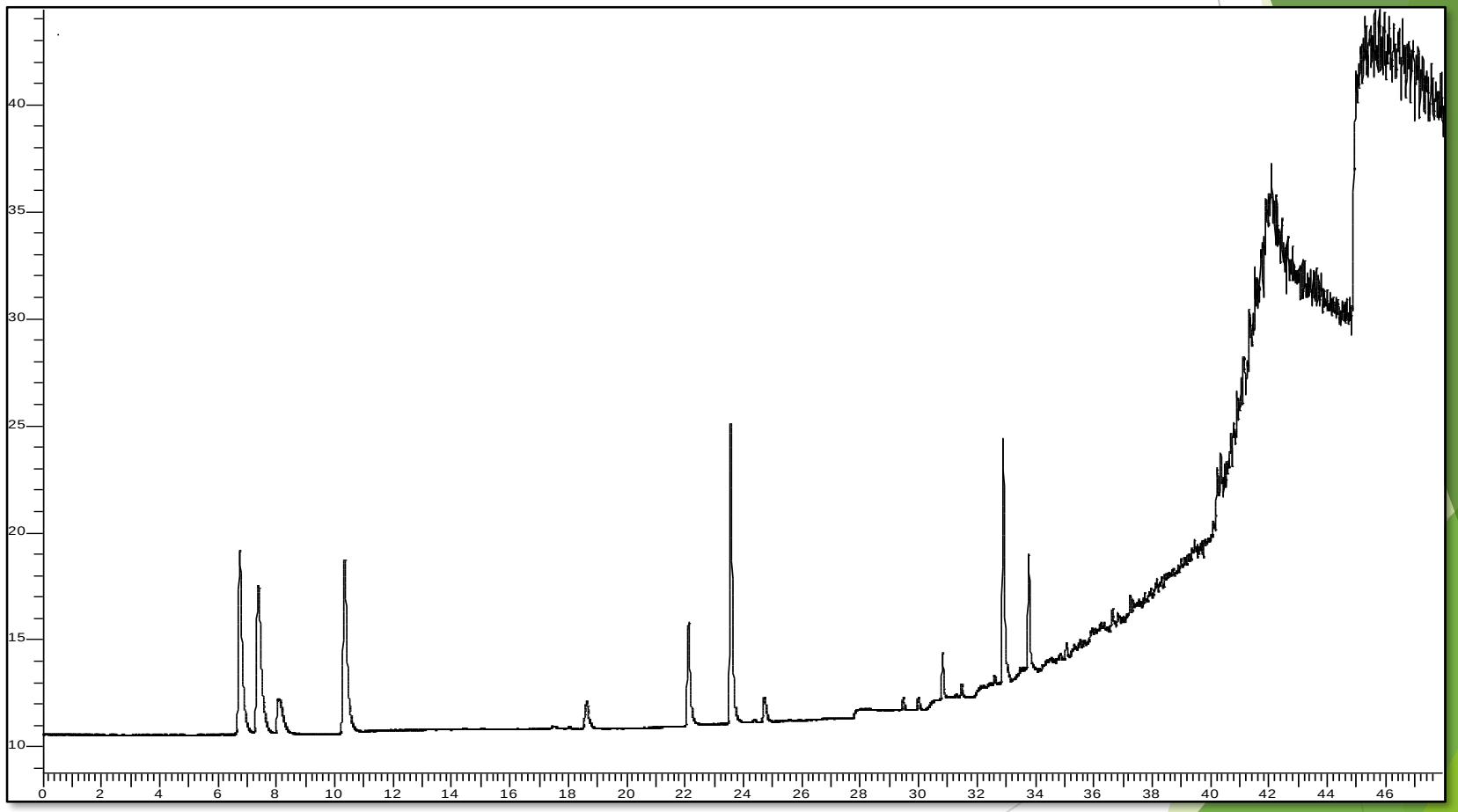
Chromatographic Issues
Baselines

Baseline Ramp caused by detector ferrule.
Follows temperature profile



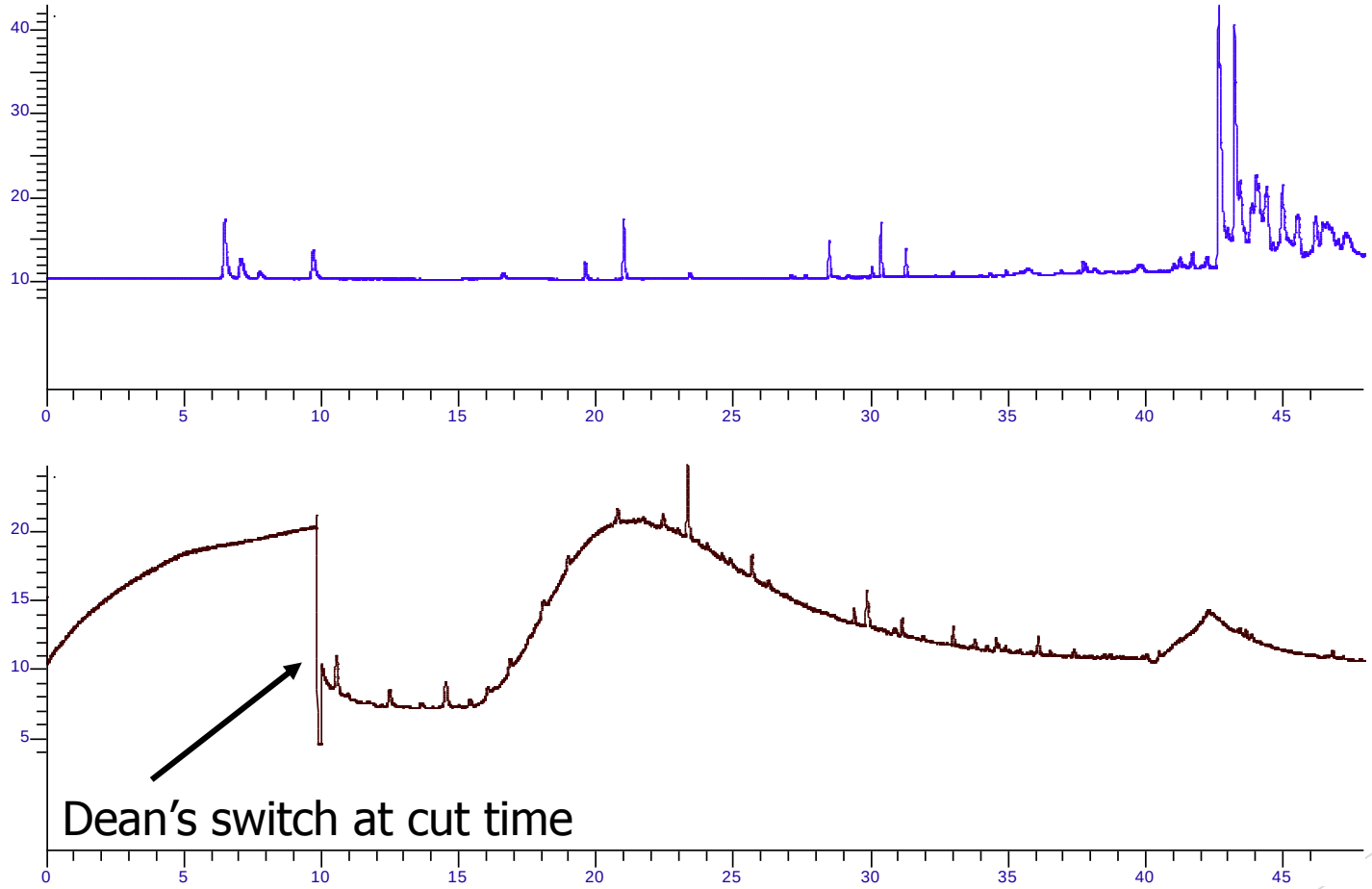
Chromatographic Issues
Baselines

Contamination possibly from leak detection solutions.

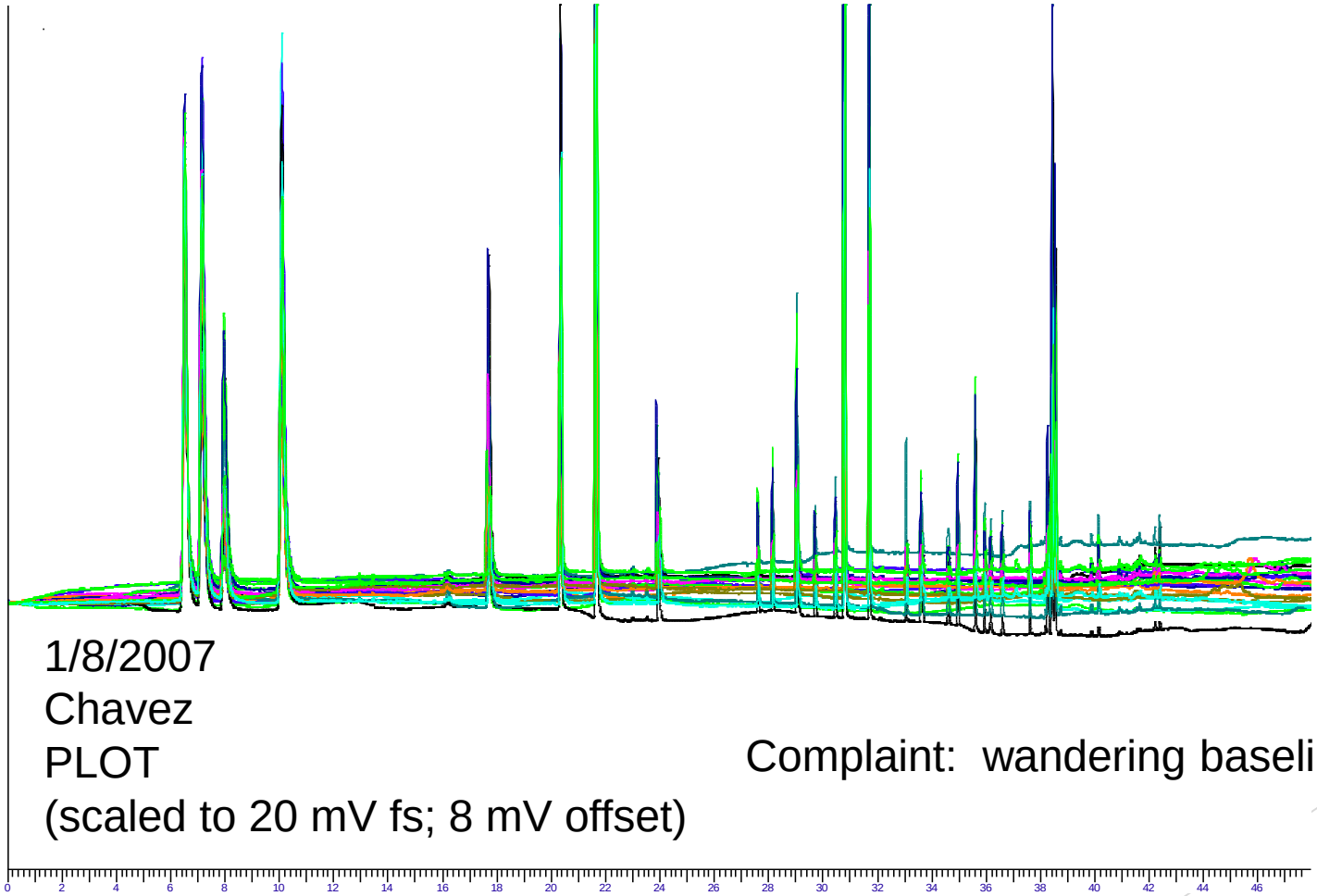


Chromatographic Issues
Baselines

New System
Ambient Air



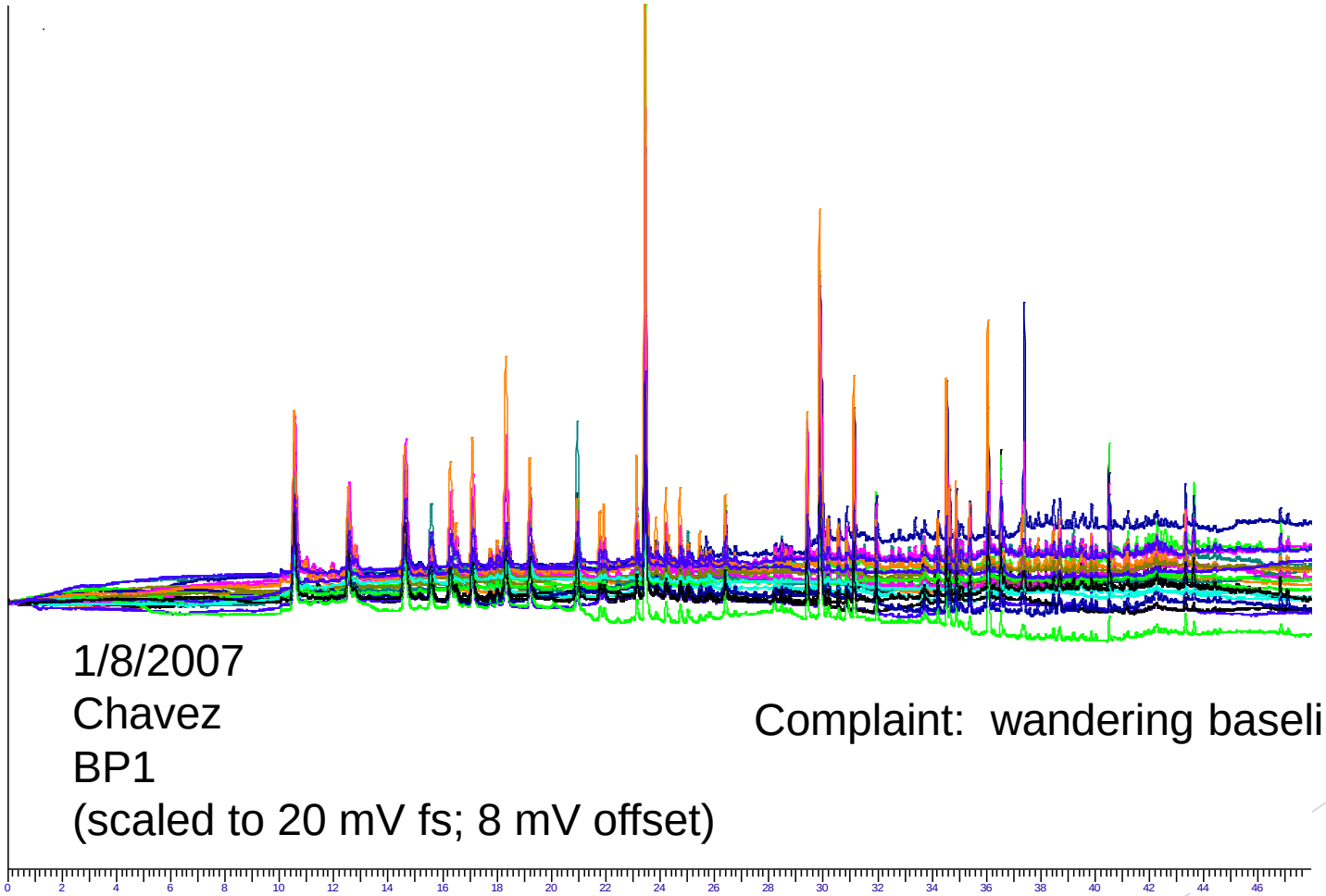
Chromatographic Issues
Baselines



1/8/2007
Chavez
PLOT
(scaled to 20 mV fs; 8 mV offset)

Complaint: wandering baseline

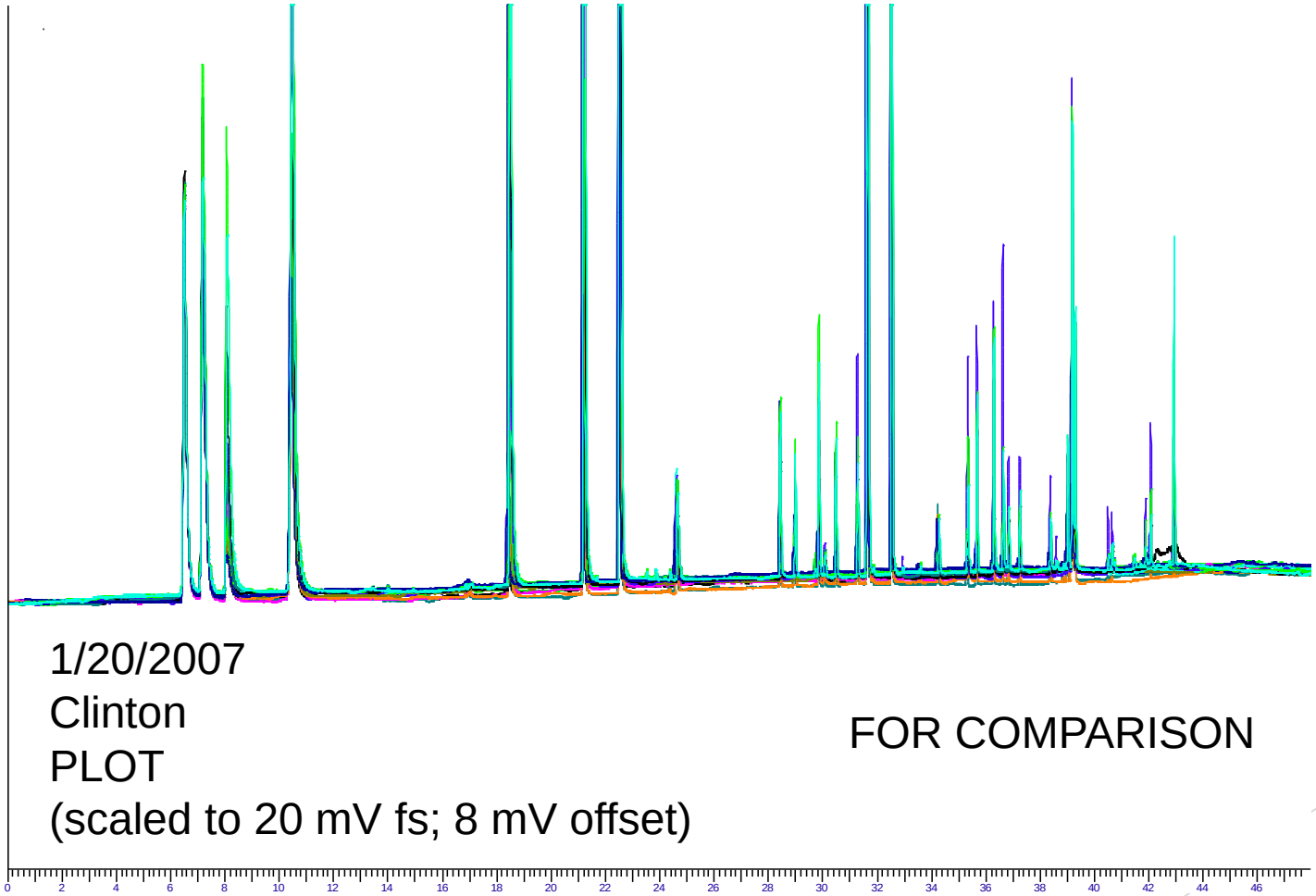
Chromatographic Issues
Baselines



1/8/2007
Chavez
BP1
(scaled to 20 mV fs; 8 mV offset)

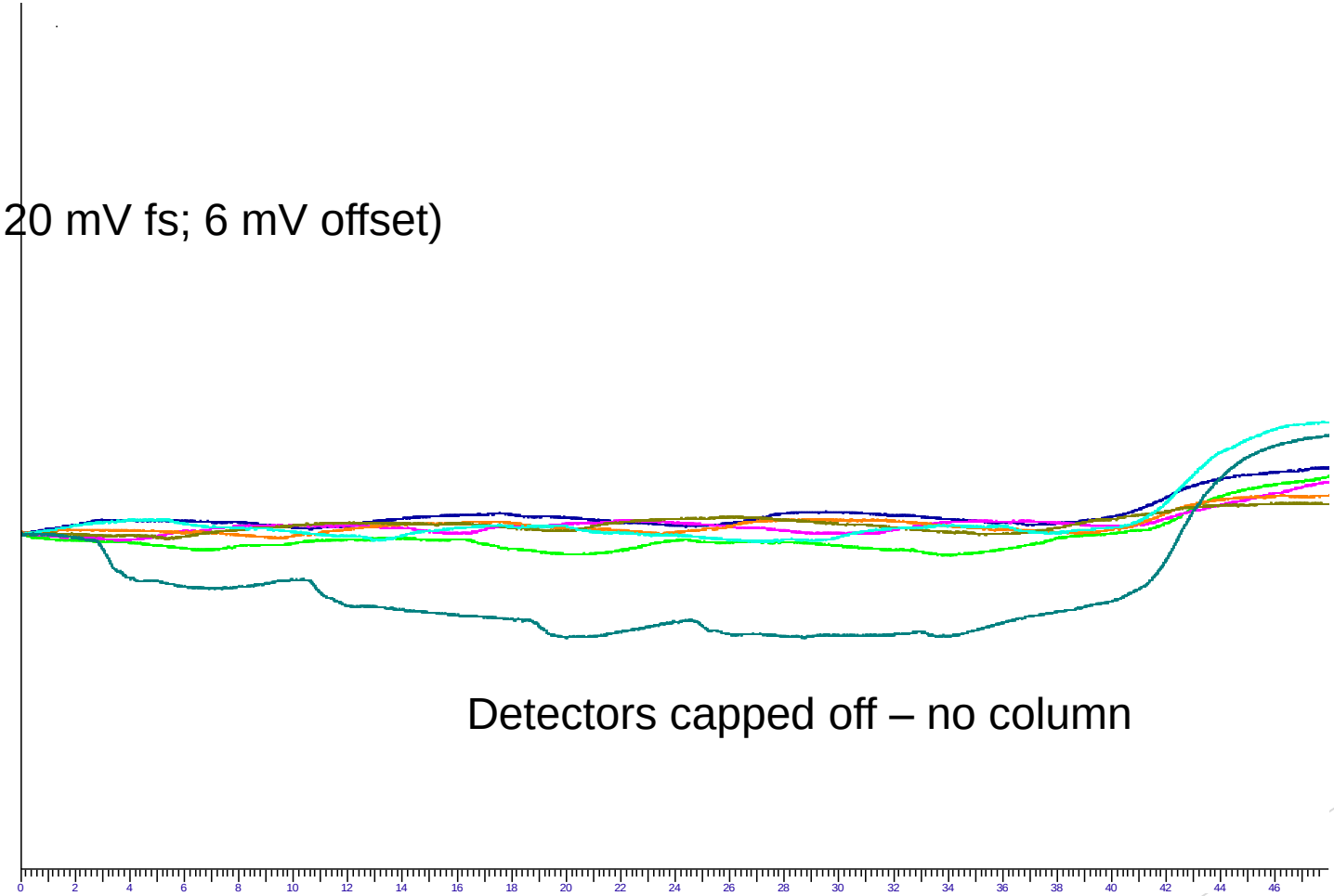
Complaint: wandering baseline

Chromatographic Issues
Baselines



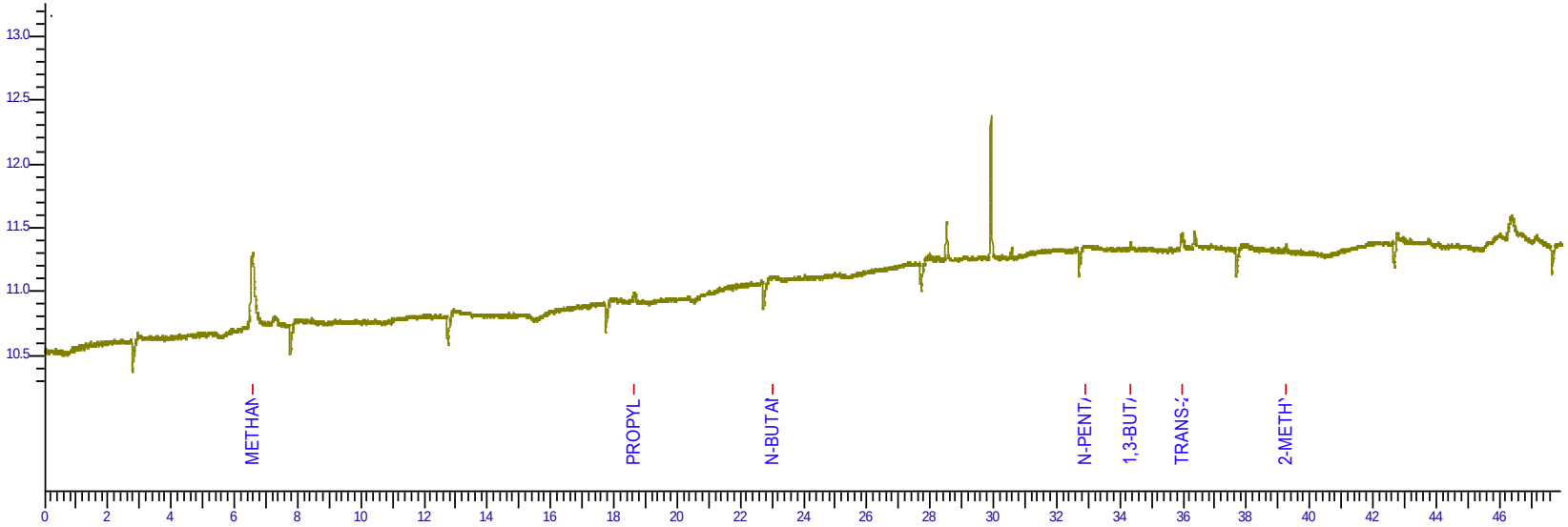
Chromatographic Issues
Baselines

1/26/2007
Chavez
PLOT
(scaled to 20 mV fs; 6 mV offset)



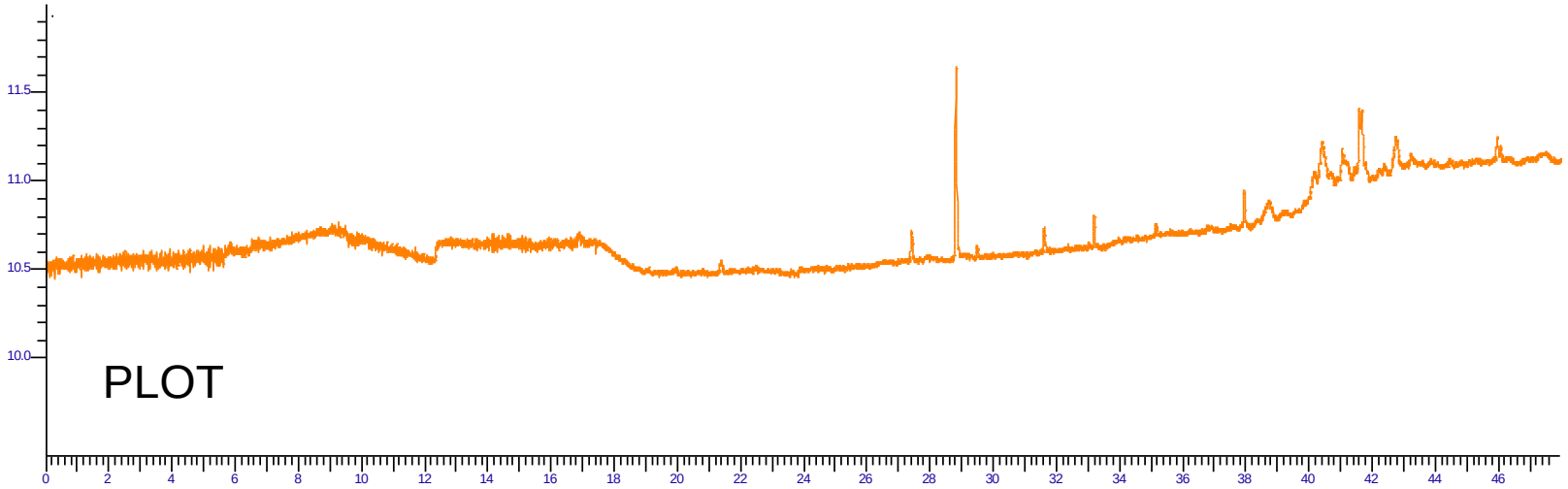
Detectors capped off – no column

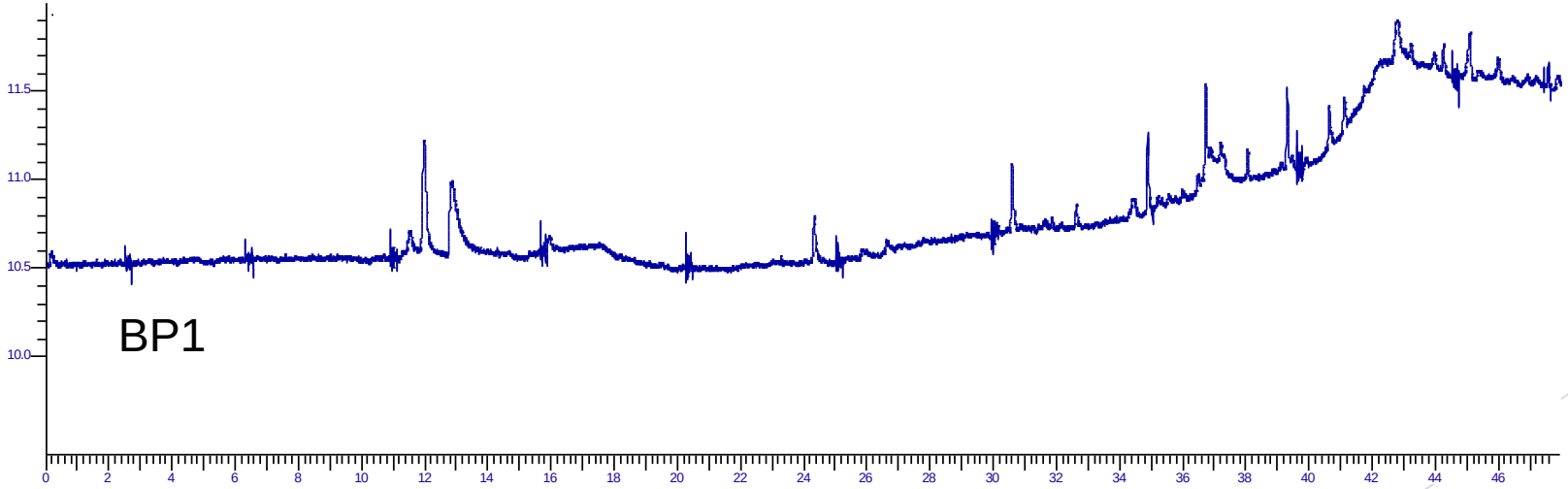
Chromatographic Issues
Baselines



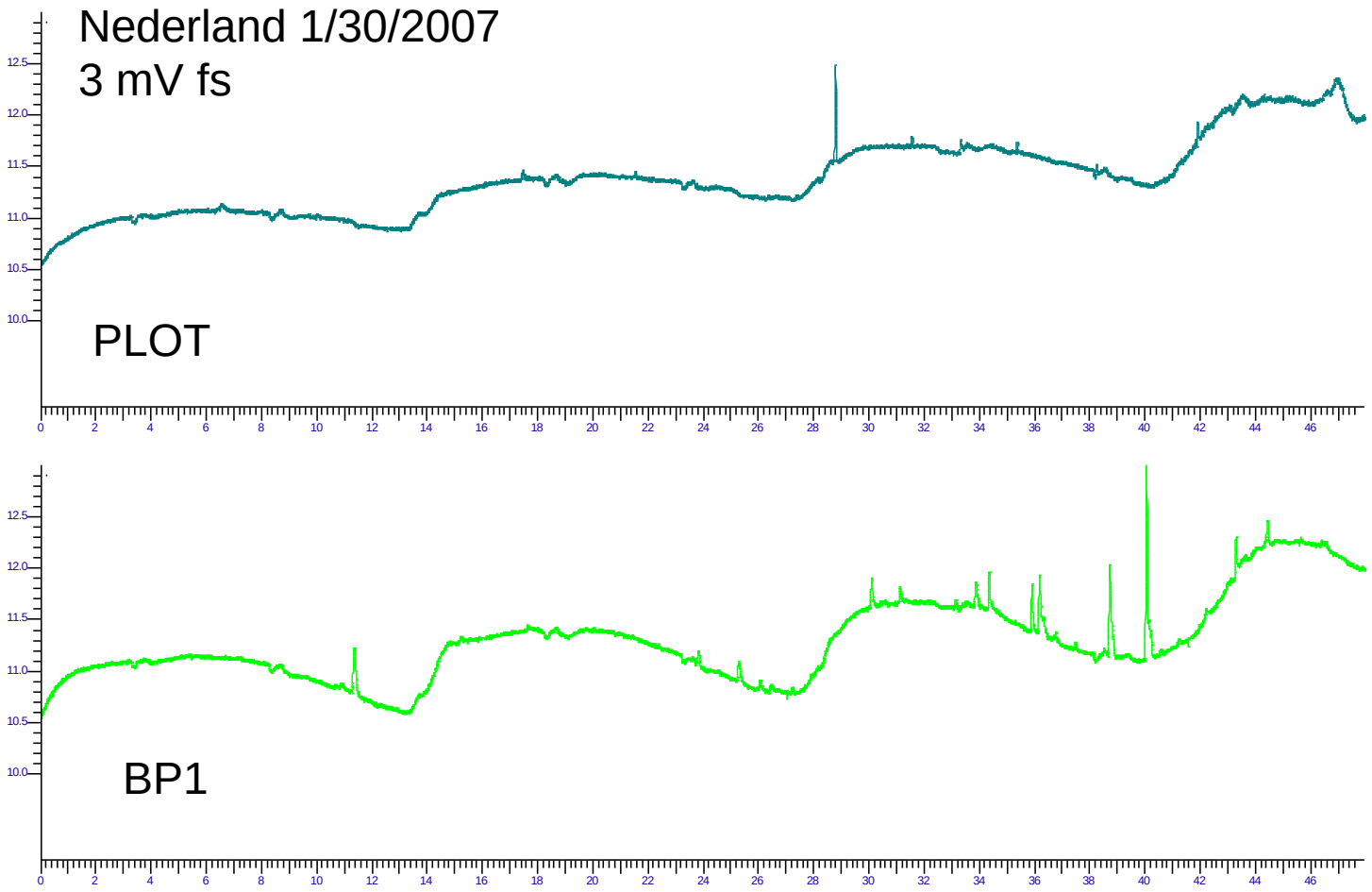
Tics every 4 minutes (10-12/chromatogram)
Backpressure pulses from TOC PSA switching

Chromatographic Issues
Baselines



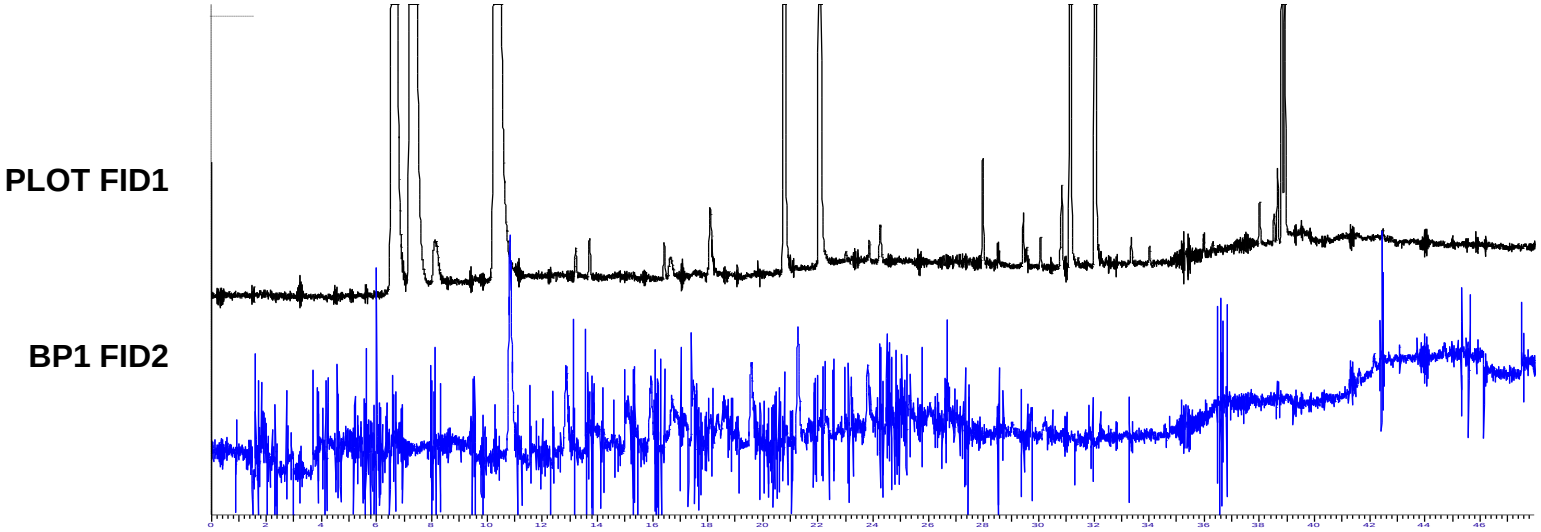


Chromatographic Issues
Baselines

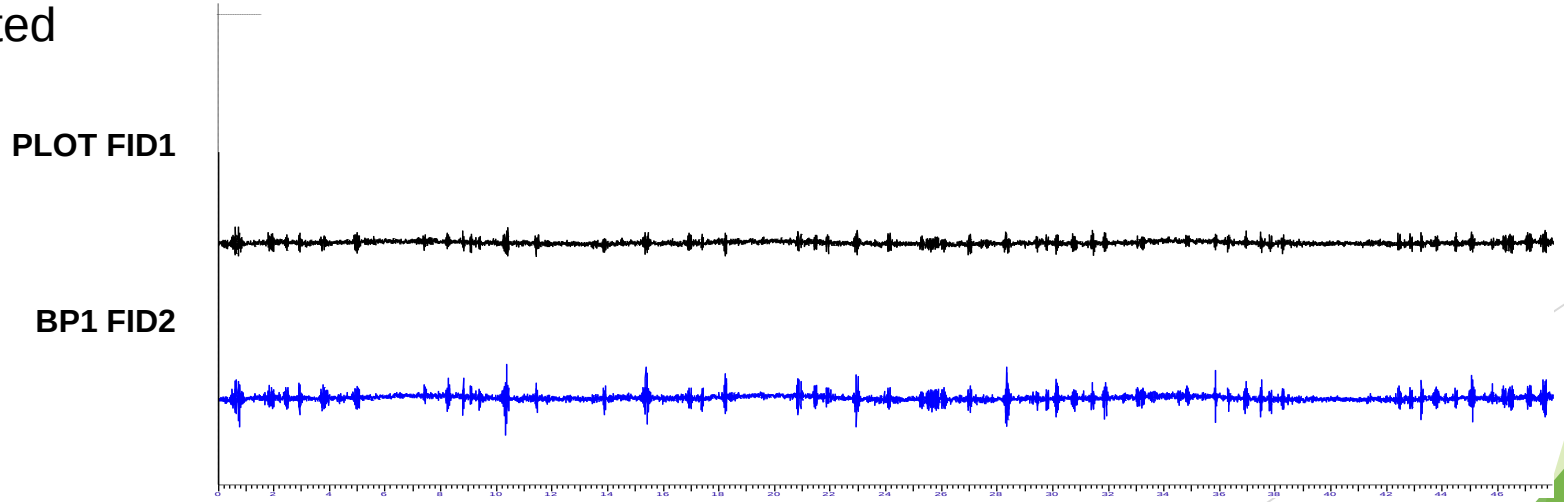


Chromatographic Issues
Baselines – Power Issues

Sample

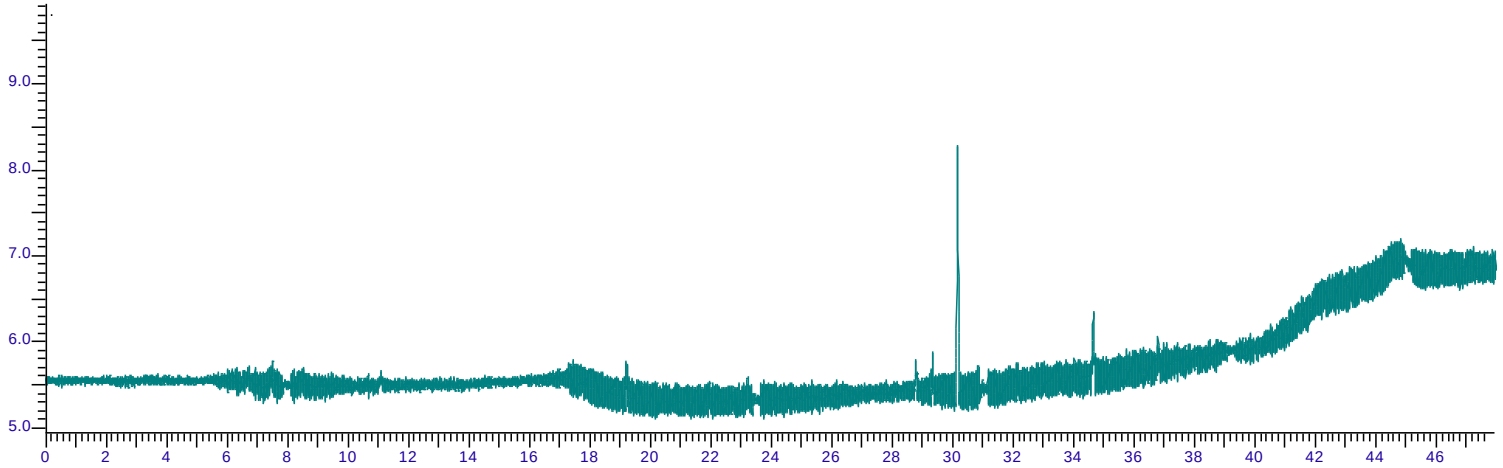


FID Disconnected

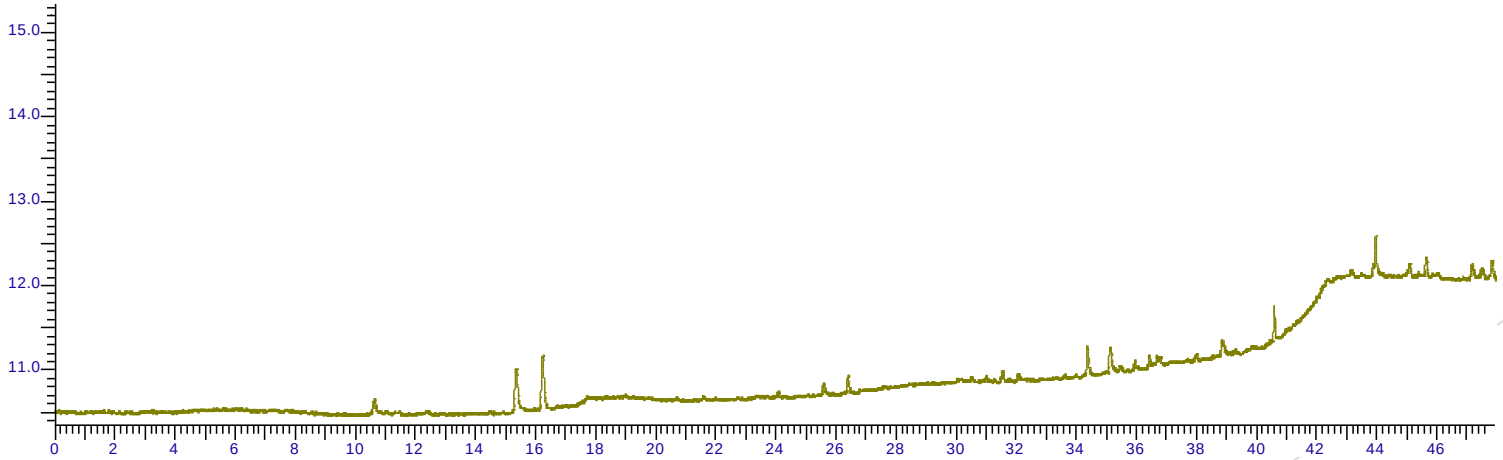


Chromatographic Issues
Baselines – Hydrogen Change

FID A



FID B



Quality Control Failures
CVS Failures Low or High for all Components

- Confirm by re-run
- Check blender settings
- Check canister pressure
- Check actual sample flow on TD
- Run LCS to determine if it is also low – if yes
  - Check OTSP compared to previous recorded value
  - Check TD sample flow compared to previous recorded value

Quality Control Failures
CVS Failures – No Peaks

- Check to see if ambient air has peaks – If none:
  - Check FID's are lit
  - Check sample pump is operational
  - Check BP1 column flow at Deans' switch - broken or plugged at TD or at Deans switch
- No peaks on PLOT column
  - FID A out
  - Dean's switch fails to activate (peaks before P+ on BP1 column)
  - PLOT column broken or plugged – check for flow
  - FID A connection to IF lost
- No peaks on BP1 column
  - FID B out
  - Restrictor broken or plugged – check for flow
  - FID B connection to IF lost

Quality Control Failures
LCS Failures – CVS is OK

- No peaks or small peaks
  - No can or valve closed (gauge suspect?)
  - Can empty – power failure – DVI's on battery back up
- Looks like RTS or Ambient
  - Is can attached?
  - Check DVI is powered
  - Use Hands-on to check relay connectivity to IF
    - Relay 3 should be RTS
    - Relay 4 should be LCS
    - Relay 6 should be calibrant port
    - Relay 7 should be sample
- Additional peaks in chromatogram
  - Contamination
  - Leaks in sample system

Quality Control Failures
Individual Peaks Failing in LCS or CVS

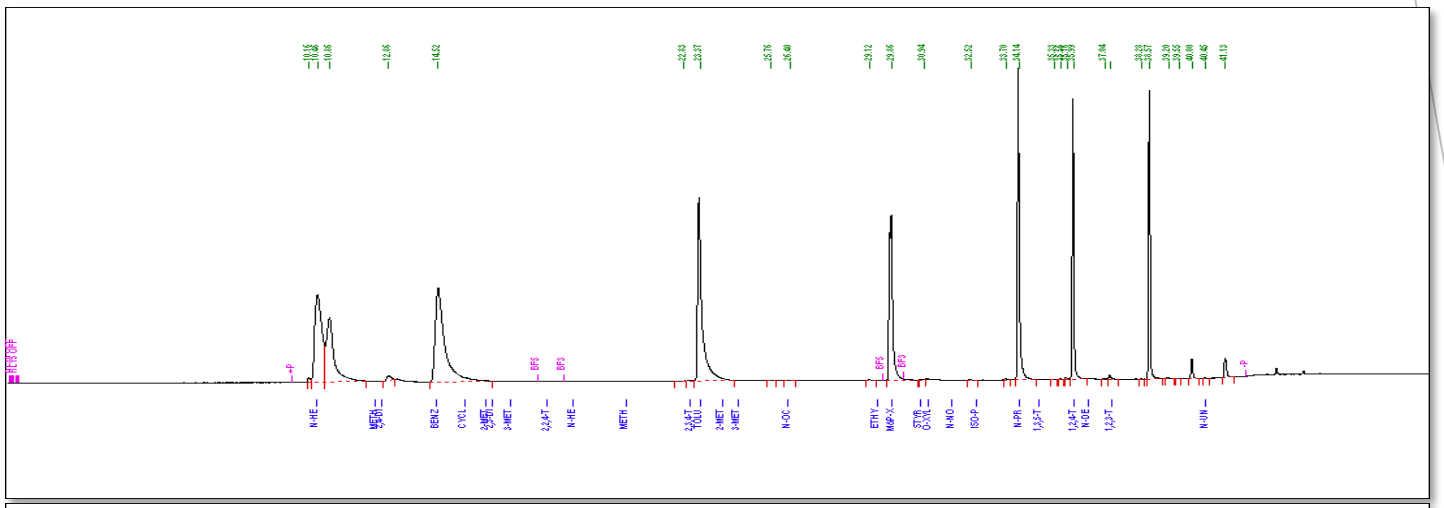
- Check for RT shifting resulting in mis-ID
- Acetylene
  - After trap change
  - Check Ethane recovery – if low as well
    - Check Desorb vent flow <10 sccm
    - Check sample flow with piston flowmeter
  - Replace canister
- 2-Methylpentane
  - Integration parameters – may not be biggest peak
  - Optimize method
- 1,2,4 – Trimethylbenzene (see blanks)
  - Check sample line heaters
  - Canister filling issues
  - Adsorption problems – trap incorrectly installed
  - Trap failures, dirty filter disks
  - Contaminated Dean's switch

Quality Control Failures
Trap Failures

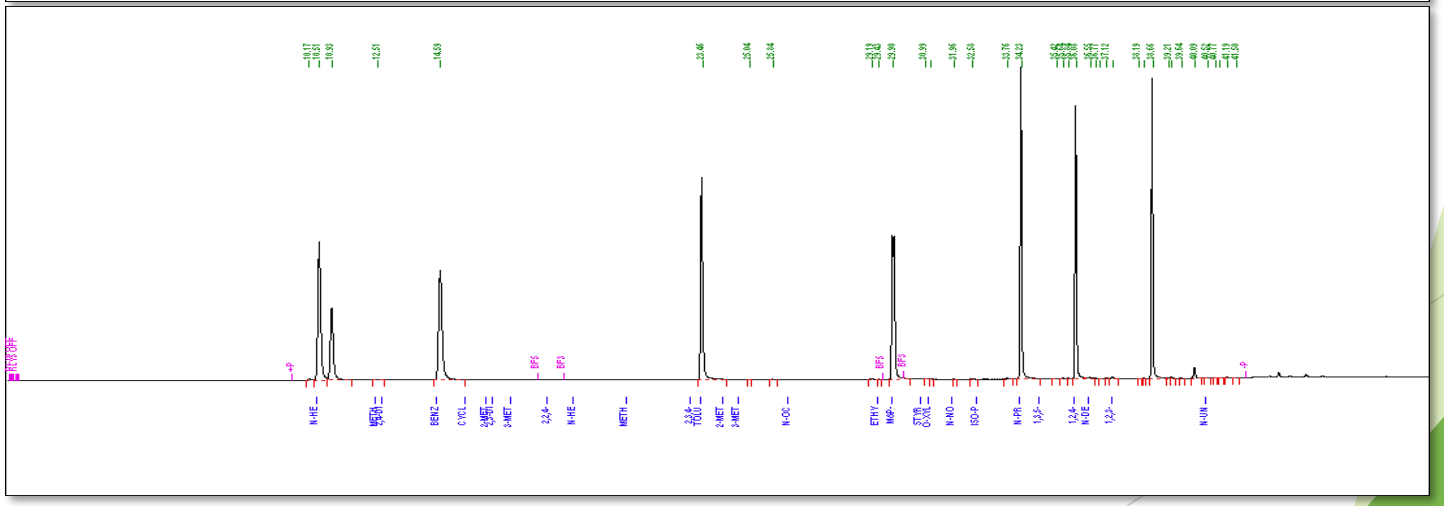
- Results in differential response
  - Type 1 – Mixing (most common)
    - Losses of Hexane, Benzene and Toluene
    - Peak shapes for early components on BP column poor, tailing
  - Type 2 – Trap material moves out of heated zone
    - Losses of Xylene, N-propylbenzene, 1,2,4-TMB
    - Peak shape for late components may or may not be poor
- Generally limited to BP column recoveries

Trap Failures
BP Column Before and After Failure

After

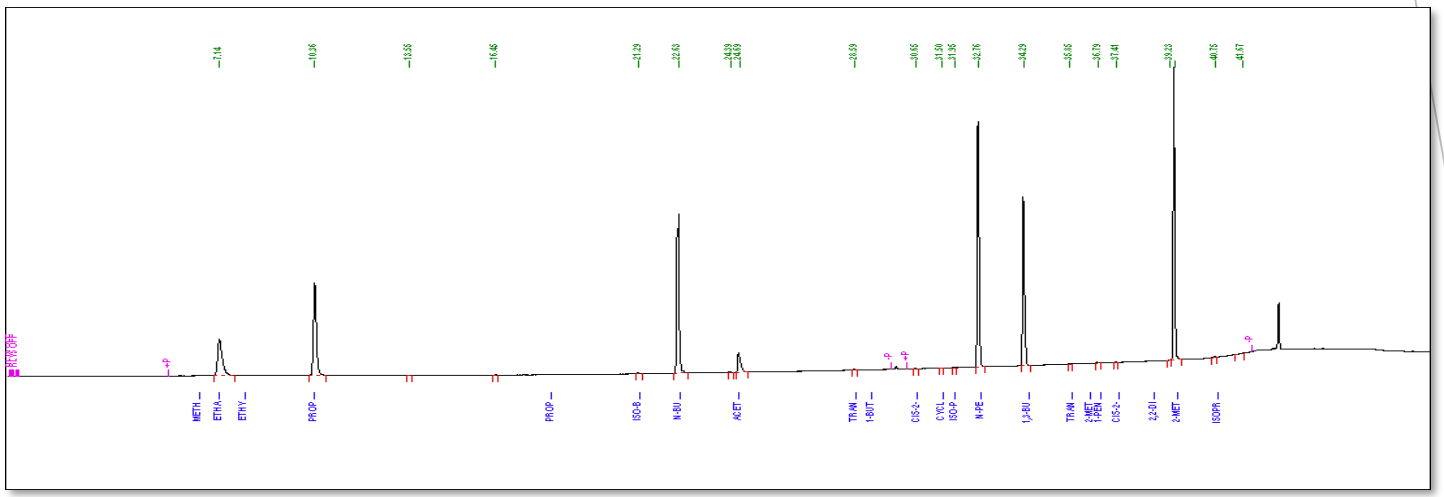


Before

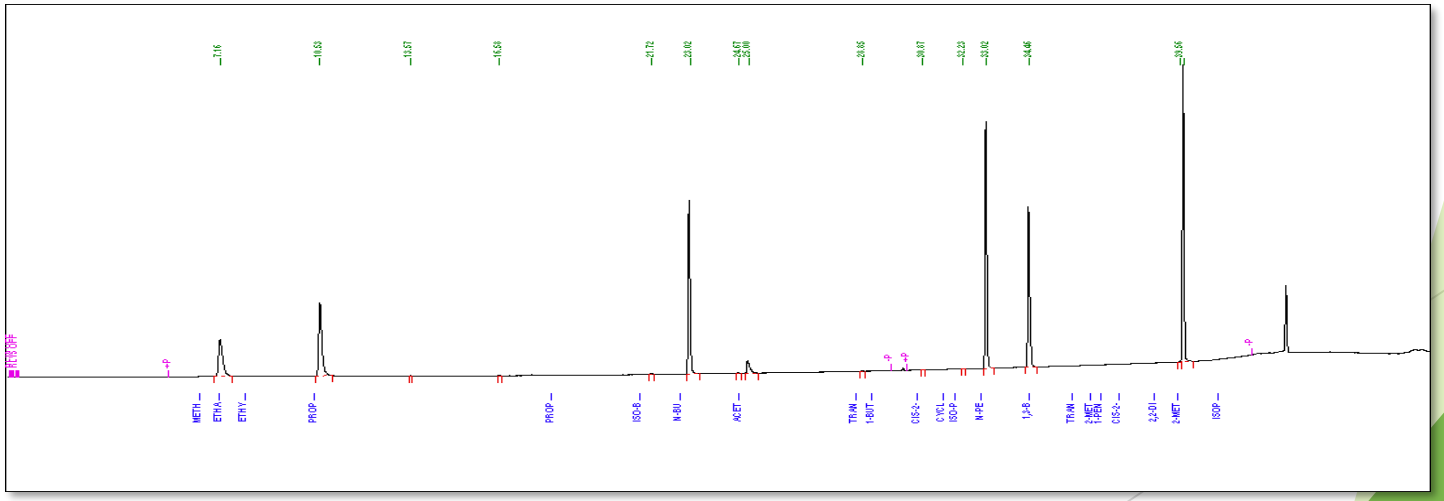


Trap Failures
PLOT Column Before and After Failure

After



Before



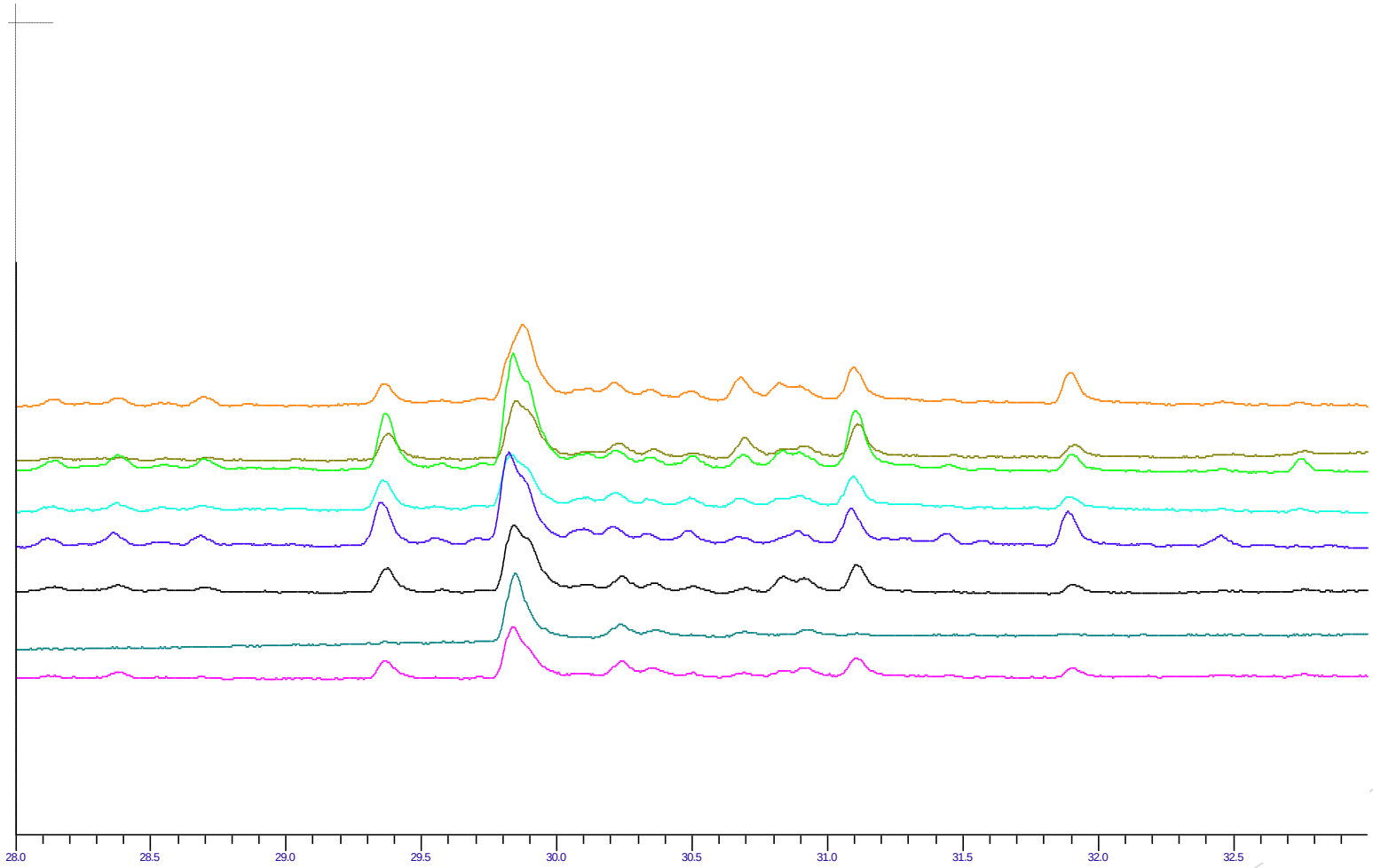
Quality Control Failures
Blanks

- Failing Totals
  - New trap – mostly on BP1 column
  - System contamination due to trailer activity
- Propylene, ethylene or butenes
  - Contamination of Nafion drier from high ambient levels – replace nafion with conditioned one
- CVS/LCS component carry over or ‘memory’
  - Generally last 3 – 4 components on BP1 column
  - Possible adsorption problems
    - Trap material escaped from trap – filter disk
    - PLOT column particulate in restrictor end of Dean’s switch
  - Often related to compressor/TOC failures resulting in high moisture levels in sample and lines.

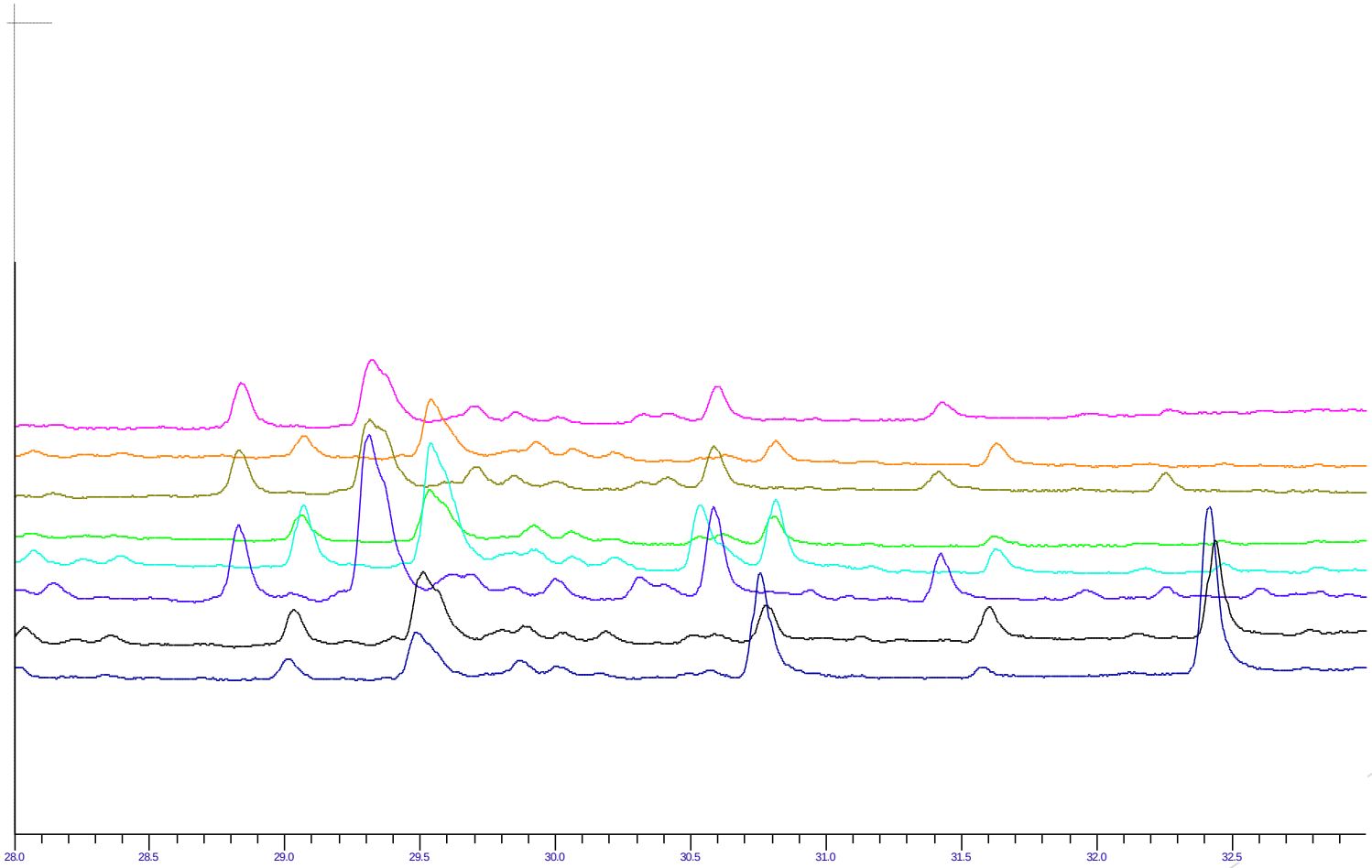
Quality Control Failures
Retention Time Standard

- Retention time not the same as ambient air
  - RTS times are longer than ambient
    - canister not humidified enough
    - Nafion not working well
      - Dry air purge not dry
      - Dry air purge not high enough flow (150-250 mL/min)
  - Retention time not stable
- If canister is > 1 year old replace
  - Loss of heavy components
  - Loss of acetylene

Retention Time Shifting
BP1 Column



Retention Time Shifting
BP1 Column

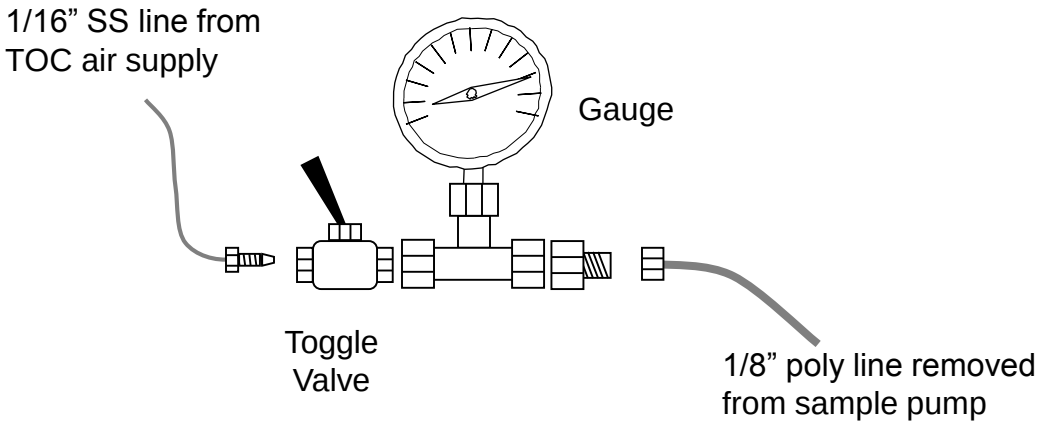


Leak Tests

- Sample Leak test
  - Will show leaks in sample flowpath associated with TD. Use when:
    - LCS high when CVS is good
    - Contamination in all samples
    - Low values for CVS, when LCS is good
  - TD should be in Standby and RTS and LCS canisters closed
  - Set Sample/Calibrant valve to Sample
  - Remove sample line and cap sample inlet on TD
  - Remove poly line from vacuum pump and attach to test manifold*
- Pressure Drop Leak test
  - Plug both columns at detector (using septa)
  - Set TD and Midpoint to 48 psi
  - Back off both TD and GC regulators to determine if there are leaks at TD or in Dean's switch
  - Good when one column only is failing CVS and LCS

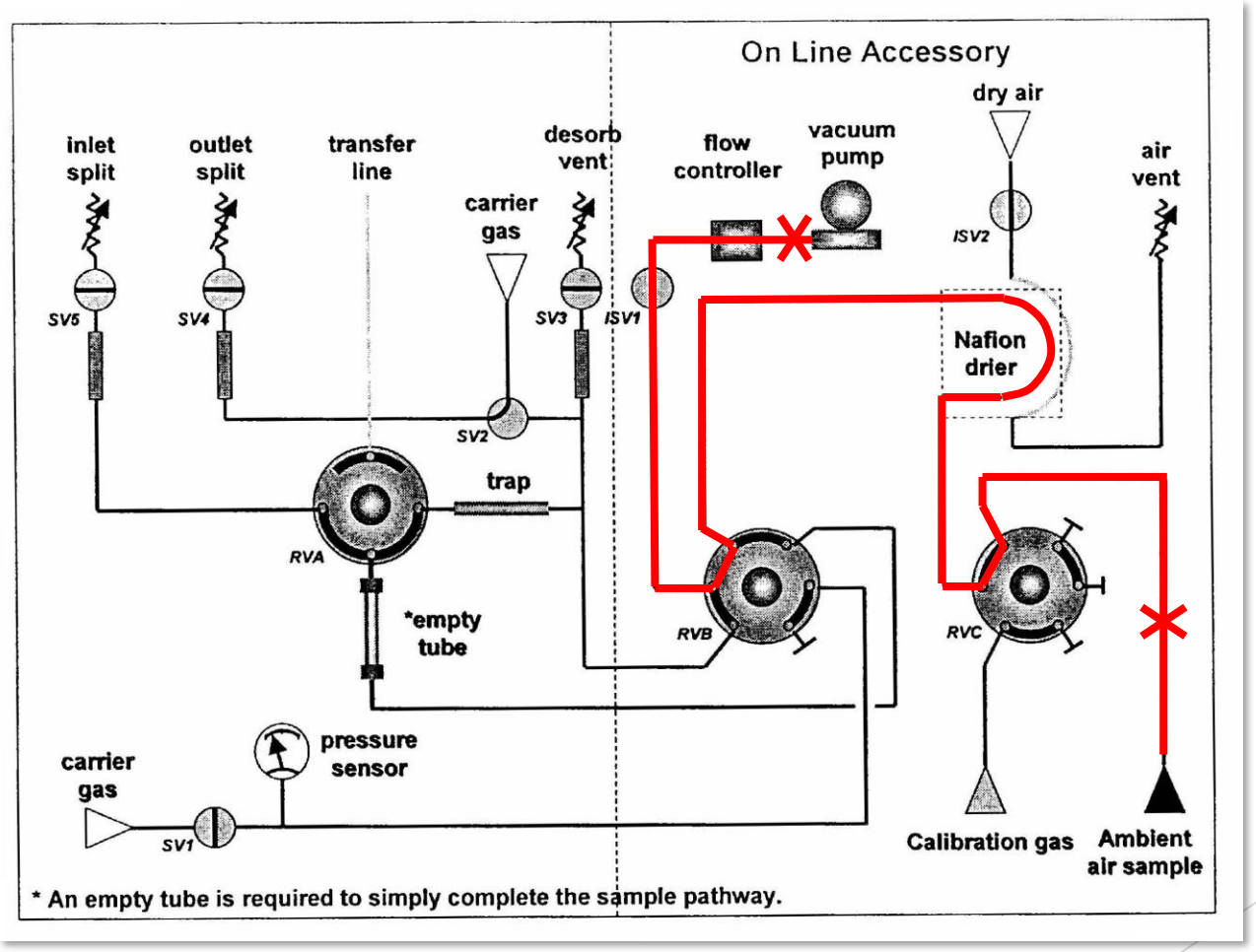
Leak Tests

Sample System Test Manifold



1. Use Toggle to pressure system up to 60 psig (may require open and close several times)
2. Close Toggle and observe for pressure drop over 5 to 10 minutes.

Leak Tests


On Line Accessory
inlet split
outlet split
transfer line
desorb vent
carrier gas
flow controller
vacuum pump
dry air
air vent
SV5
SV4
SV3
ISV1
ISV2
SV2
Nafion drier
trap
RVA
*empty tube
RVB
RVC
pressure sensor
carrier gas
SV1
Calibration gas
Ambient air sample
* An empty tube is required to simply complete the sample pathway.

Leak Tests
Turbomatrix Air Supply Leaks

- In-line flowmeter should read 0.4 to 0.7 slpm
- Make initial observation of flow
  - Turn off TD
    - Removes Nafion flow and air to internal pneumatics on TD
    - Normal drop is only nafion setpoint – 0.25 slpm
  - Turn off Drier toggle valve
    - Removes pneumatic air to DVI's
    - Removes pneumatic air to Peltier
    - Normal drop is only peltier flow ~ 0.1 slpm
  - Back off Blender zero gas
    - Normal drop is amount of zero flow from blender spreadsheet ~ 0.1 to 0.15 slpm
- These tests will not identify leaks in compressor, or internal to the zero air purifier or TOC

Leak Tests
Testing Canisters attached to LCS/RTS ports

- Attach new canister and leave valve closed
- Use Hands-on or DVI switches to switch the appropriate relays to select the canister just attached*
- Observe sample flow (actual) on TD
- Sample flow should fall to <0.2 sccm
- Open canister valve to re-establish flow

*Note: You must manually switch both DVI's to access LCS and RTS ports for each test

System Shut-down

- Power off GC and TD
- Close shut-off valves on Hydrogen cylinders
  - Close cylinder valves on all cylinders
  - Option: Remove regulators and secure cylinders in the event of Hurricane
- Carrier can be left flowing to GC and TD for temporary shut-downs
- Power off Zero Air purifier and TOC gas generator.
  - Close toggle valves to Zero Air, TOC and any auxiliary air cylinder if installed.
  - Close toggle valve on drier to TD.
- If there is an AC failure other electrical equipment such as computers and monitors may need to be powered off to protect them from excessive heat.
- Excessive heat over prolonged periods have been seen to cause issues for standards

System Start-up

- Startup compressor
  - note any issues on pressure building like hissing or leaking of shut-off valve assembly or auto drain.
- Zero Air start-up
  - Once compressor has reached 100 psig pressure, open toggle valve to zero air purifier.
  - Zero air must be disconnected from GC and allowed to flow at least 4 hours while heating up (use cap or other restriction to limit flow during warm-up)
- TOC Start-up
  - Open toggle valve to TOC and observe pressure build on inline regulator.
  - Confirm inline regulator reaches 80 psig. And there is no leaking in the TOC.
- Re-establish FID flows
  - Confirm air and hydrogen flows are correct
  - Wait until detectors reach the correct temperature 250 °C
  - Ignite FIDs and observe mV signal for unusual values (-97)
- Open air line toggle valve on drier to TD and power on TD