Review of the NTWQM Nontidal Network: Sampling and Data Management Issues

January 2013 NTWG Action Team Call: Guidance for WY2012 Data Submittals

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AGENDA: Issues To Discuss

- WY2012 Data Submittal Timeline
- Consistency Checks
  - To be performed at Data Collector level
- tab_MethodLimit Table
  - Parameters, Methods, CIMS Method Codes, MDLs, RLs
- Field Blank and Duplicate Sample Frequencies
  - NTN Station Groups for Field Blank and Duplicate Sample frequency determinations
- DUET User Guide (prepared by Vistronix, Inc.)

Consistency Checks: By AGENCY/SOURCE ID Group

AGENCY	SOURCE	STATION_ TYPE	EVENT_ TYPE	STATION	CONSISTENCY CHECKS		
DEDNREC	DEDNREC	Primary	R, RSI, S, ONS or OS	304191, 302031	[NH4W] + [NO23W] ≤ [TN]	[PO4F] ≤ [TP]	[DOC] ≤ [TOC]
					[NH4W] ≤ [TN]	[NO23W] ≤ [TN]	
USGSWV	USGSWV	Primary	R, RSI, S, ONS or OS	01604500, 01608500, 01616500, 01613030, 01616400, 01611500, 01618100	[NH4F] + [NO23F] ≤ [TN]	[NH4F] ≤ [TN]	[NO23F] ≤ [TN]
					[PO4F] ≤ [TP]	[NO2F] ≤ [NO23F]	
USGSWV	USGSWV	Primary	R, RSI, S, ONS or OS	01595300, 01614000, 01636500	[NH4F] + [NO23F] ≤ [TDN]	[NO2F] ≤ [NO23F]	[PO4F] ≤ [TDP]
					[TDP] ≤ [TP]		
					[NH4F] ≤ [TDN]	[NO23F] ≤ [TDN]	
SRBC	SRBC	Primary	R, RSI, S, ONS or OS	01502500, 01503000, 01529500, 01511500	[NH4W] ≤ [TKNW]	[NH4F] ≤ [TKNF]	[PO4F] ≤ [TDP]
					[TKNF] ≤ [TKNW]	[TDP] ≤ [TP]	
					[NO23F] ≤ [NO23W]	[NH4F] ≤ [NH4W]	
SRBC	SRBC or NYSDEC	Primary	R, RSI, S, ONS or OS	01515000, 01531000	[NH4W] ≤ [TKNW]	[NH4F] ≤ [TKNF]	[PO4F] ≤ [TDP]
					[TKNF] ≤ [TKNW]	[TDP] ≤ [TP]	
					[NO23F] ≤ [NO23W]	[NH4F] ≤ [NH4W]	
MDDNR	MDDNR	Primary	R, RSI, S, ONS or OS	TUK0181, BEL0053, DER0015, GUN0258, NPA0165, GWN0115, PXT0972, TF1.2, GEO0009, WIL0013, ANT0047, CAC0148, MON0546, LXT0200, MGN0062, NWA0016, WCK0001, MKB0016, CVA0046, WIL0065	[NH4F] + [NO23F] ≤ [TDN]	[PO4F] ≤ [TDP]	[NO2F] ≤ [NO23F]
					[NH4F] ≤ [TDN]	[NO23F] ≤ [TDN]	
					-		
MDDNR	USGSMD	Primary_RIM	R, RSI, S, ONS or OS	01491000, 01578310, 01594440, 01646580	[NH4F] + [NO23F] ≤ [TDN]	[TDP] ≤ [TP]	[PO4F] ≤ [TDP]
					[NO2F] ≤ [NO23F]	[VSS] ≤ [TSS]	[HPO4F] ≤ [TDP]
					[PIC] ≤ [PC]	[NO23F] ≤ [TDN]	[NH4F] ≤ [TDN]

AGENCY	SOURCE	STATION_ TYPE	EVENT_ TYPE	STATION	CONSISTENCY CHECKS		
PADEP	SRBC	Primary	R, RSI, S, ONS or OS	WQN0201, WQN0214, WQN0273, WQN0301, WQN0305, WQN0401, WQN0204, WQN0210, WQN0223, WQN0229, WQN0243, WQN0263, WQN0271, WQN0272, WQN0302, WQN0404, WQN0445, WQN0448, WQN0226, WQN0281, WQN0282	[NH4F] + [NO23F] ≤ [TDN] [TDN] ≤ [TN] [NH4W] + [NO23W] ≤ [TN]	[PO4F] ≤ [TDP] [FSS] ≤ [TSS]	[NO23F] ≤ [NO23W] [TDP] ≤ [TP]
					[NO23F] ≤ [TDN] [NH4F] ≤ [TDN]	[NO23W] ≤ [TN]	[NH4W] ≤ [TN]
PADEP	USGSPA	Primary	R, RSI, S, ONS or OS	WQN0317, WQN0410, WQN0224, WQN0217, WQN0212, WQN0269, WQN0278, WQN0280	[NH4F] + [NO23F] ≤ [TDN] [TDN] ≤ [TN] [NH4W] + [NO23W] ≤ [TN]	[PO4F] ≤ [TDP] [FSS] ≤ [TSS]	[NO23F] ≤ [NO23W] [TDP] ≤ [TP]
					[NO23F] ≤ [TDN] [NH4F] ≤ [TDN]	[NO23W] ≤ [TN]	[NH4W] ≤ [TN]
PADEP	PADEP	Primary	R, RSI, S, ONS or OS	WQN0501, WQN0509, WQN0510, WQN0511, WQN0512, WQN0513	[NH4F] + [NO23F] ≤ [TDN] [TDN] ≤ [TN] [NH4W] + [NO23W] ≤ [TN]	[PO4F] ≤ [TDP] [FSS] ≤ [TSS]	[NO23F] ≤ [NO23W] [TDP] ≤ [TP]
					[NO23F] ≤ [TDN] [NH4F] ≤ [TDN]	[NO23W] ≤ [TN]	[NH4W] ≤ [TN]
VADEQ	USGSVA	Primary_RIM	R, RSI, S, ONS or OS	TF5.0A, TF4.0P, TF5.0J, TF3.0, TF4.0M	[NH4F] + [NO23F] ≤ [TDN] [TDN] ≤ [TN]	[PO4F] ≤ [TDP]	[FSS] ≤ [TSS]
					[NO23F] ≤ [TDN]	[NH4F] ≤ [TDN]	
VADEQ	USGSVA	Primary (Sampled as a Primary_RIM)	R, RSI, S, ONS or OS	2-JMS113.20	[NH4F] + [NO23F] ≤ [TDN] [TDN] ≤ [TN]	[PO4F] ≤ [TDP]	[FSS] ≤ [TSS]
					[NO23F] ≤ [TDN]	[NH4F] ≤ [TDN]	
VADEQ	USGSVA	Primary	R, RSI, S, ONS or OS	1BNFS010.34, 1BSMT004.60, 1BSSF003.56, 2-CHK035.26, 3-RAP030.21, 8-NAR005.42, 1BMDD005.81, 1ADIF000.86, 7-DRN010.48, 1ASOQ006.73	[NH4W] + [NO23W] ≤ [TN]	[PO4F] ≤ [TP]	[FSS] ≤ [TSS]
					[NO23W] ≤ [TN]	[NH4W] ≤ [TN]	

AGENCY	SOURCE	STATION_ TYPE	EVENT_ TYPE	STATION	CONSISTENCY CHECKS
VADEQ	VADEQ/SCRO or USGSVA	Primary	R, RSI, S, ONS or OS	2-JMS279.41, 2-APP110.93	[NH4W] + [NO23W] ≤ [TN] [PO4F] ≤ [TP] [FSS] ≤ [TSS] [NH4W] ≤ [NO23W] ≤ [TN] [TN]
VADEQ	VADEQ/NRO or USGSVA	Primary	R, RSI, S, ONS or OS	1AACO014.57, 3-RPP147.49, 8-MPN094.94	[NH4W] + [NO23W] ≤ [TN] [PO4F] ≤ [TP] [FSS] ≤ [TSS] [NH4W] ≤ [NO23W] ≤ [TN] [TN]
VADEQ	VADEQ/VRO or USGSVA	Primary	R, RSI, S, ONS or OS	2-RVN015.97, 1BSSF100.10	[NH4W] + [NO23W] ≤ [TN] [PO4F] ≤ [TP] [FSS] ≤ [TSS] [NH4W] ≤ [NO23W] ≤ [TN] [TN]
VADEQ	VADEQ/NRO	Secondary	R	3-RAP066.54, 3-ROB001.90, 8-POR008.97, 1ACAX004.57	[NH4W] + [NO23W] ≤ [TN] [PO4F] ≤ [TP] [FSS] ≤ [TSS] [NH4W] ≤ [NO23W] ≤ [TN] [TN]
VADEQ	VADEQ/VRO	Secondary	R	1BSTH027.85, 2-BCC004.71, 2-BLP000.79, 2-CFP004.67, 2-MCM005.12, 2-MRY014.78	[NH4W] + [NO23W] ≤ [TN] [PO4F] ≤ [TP] [FSS] ≤ [TSS] [NH4W] ≤ [NO23W] ≤ [TN] [TN]
VADEQ	VADEQ/PRO	Secondary	R	8-LTL009.54, 2-DPC005.20	[NH4W] + [NO23W] ≤ [TN] [PO4F] ≤ [TP] [FSS] ≤ [TSS] [NH4W] ≤ [NO23W] ≤ [TN] [TN]

NOTE: Any parameter value between the MDL and RL (Qualifier = “G”) is not subject to the consistency check.

Consistency Checks: PROBLEM Codes

PROBLEM	DESCRIPTION
	CONSISTENCY CHECK PROBLEM CODES
QQ	PART EXCEEDS WHOLE VALUE YET DIFFERENCE IS WITHIN ANALYTICAL PRECISION (PQL OR REPORTING LIMIT)
NQ	PART EXCEEDS WHOLE VALUE AND DIFFERENCE IS NOT WITHIN ANALYTICAL PRECISION
IQ	CANNOT DETERMINE IF PART EXCEEDS WHOLE VALUE AND WHETHER OR NOT DIFFERENCE IS WITHIN ANALYTICAL PRECISION
NV	NEGATIVE CALCULATED VALUE IS VALID GIVEN PRECISION OF MEASURED WATER QUALITY PARAMETERS; ACTUAL CALCULATED CONCENTRATION LIKELY IS LOW; POSSIBLY LESS THAN PQLS OF MEASURED WATER QUALITY PARAMETERS

EXCEPTION: Report all “NQ” Duplicate Sample data (regardless of consistency check results).

Consistency Check Example

"I have a PO_4 result of 0.024 mg/L, which is higher than the TDP result of 0.014. Is this a case where I would delete both values, based on what has been proposed under the ESAR DUET?"

PO_4 RL = 0.004 mg/L
TDP RL = 0.010 mg/L

Use the higher RL to assess difference; Here difference must be < 0.010 mg/L

[PO4] – [TDP] = 0.024 - 0.014 = 0.010 mg/L

The difference is exactly the same as the TDP reporting limit. However, the criterion for QQ is < RL, not ≤ RL. Therefore, without additional information from the lab, you would withhold the data and assign a "NQ" problem code.

Alternatively, you could have the lab investigate the inconsistency in results and see if there was a reporting error, or if there is a reason to justify keeping data, e.g., Reporting limits may have changed, one test may have been off, etc.

DUET Qualifier Codes

QUALIFIER_ID	QUALIFIER	DESCRIPTION
1	<	Concentration is less than method detection limit
2	>	Concentration not quantified; exceeds given value (eg.FCOLI).
3	**G**	**REPORTED VALUE IS BETWEEN THE MDL AND THE PRACTICAL QUANTITATION LEVEL (OR REPORTING LIMIT)**

tab_MethodLimit Table

LAB	PARAMETER (expected)	CIMS METHOD CODE	LAB METHOD	FILTER - Operationally Defined Particulate (Filter), Dissolved (Filtrate), and (Or) Seive Analysis (Provide Filter or Seive type (plate or pleated), and effective pore size in microns)	MDL	Units	MDL START_ DATE	MDL END_ DATE	Reporting Level	Reporting Level START_ DATE	Reporting Level END_DATE
DEDNREC	TN	L01	APHA (2002). Standard Methods for the Examination of Water and Wastewater (20th Edition), Method 4500-N.C, Alkaline Persulfate Digestion + EPA 353.2 Rev. 2.0 (1993) Determination of Nitrate-Nitrite Nitrogen by Automated Colorimetry.	---	0.023	mg N/L	TBP	TBP	0.100	TBP	TBP
DEDNREC	NH4W	L01	EPA Method 350.1 Rev. 2.0 (1993), Determination of Ammonia Nitrogen by Semi-Automated Colorimetry.	---	0.009	mg N/L	TBP	TBP	0.020	TBP	TBP
DEDNREC	NO23W	L01	EPA Method 353.2 Rev. 2.0 (1993), Determination of Nitrate-Nitrite Nitrogen by Automated Colorimetry.	---	0.004	mg N/L	TBP	TBP	0.01	TBP	TBP
DEDNREC	TP	L05	APHA (2002). Standard Methods for the Examination of Water and Wastewater (20th Edition) Method 4500-P.J; Alkaline Persulfate Digestion + EPA 365.1 Rev. 2.0 (1993) Determination of Phosphorus by Semi-Automated Colorimetry.	---	0.006	mg P/L	TBP	TBP	0.010	TBP	TBP
DEDNREC	PO4F	L01	EPA Method 365.1, Rev. 2.0 (1993), Determination of Phosphorus by Semi-Automated Colorimetry.	Encapsulated, pleated filter ??? cm-sq TBP surface area, 0.45 micron pore size	0.004	mg P/L	TBP	TBP	0.01	TBP	TBP
DEDNREC	TSS	L01	APHA (1999). Standard Methods for the Examination of Water and Wastewater (20th Edition) Method 2540-D total Suspended Solids Dried at 103 -105 C.	---	2	mg/L	TBP	TBP	5	TBP	TBP
USGSKYSL	SSC_TOTAL	L01	ASTM (2002). Standard Test Methods for Determining Sediment Concentration in Water Samples, Method D3977-97(B), Gravimetric Filtration Method; Dried at 90-105 C. (USGS Kentucky Sediment Laboratory).	Whatman #934-AH glass-fiber crucible filters (1.5 µm pore size).	**0.5 ?**	mg/L	TBP	TBP	0.5	TBP	TBP

If SSC_Total, SSC_% Fines, Alkalinity, Turbidity and Chlorophyll have only Reporting Limits, then remove entries under MDL.

LAB	PARAMETER (expected)	CIMS METHOD CODE	LAB METHOD	FILTER - Operationally Defined Particulate (Filter), Dissolved (Filtrate), and (Or) Seive Analysis (Provide Filter or Seive type (plate or pleated), and effective pore size in microns)	MDL	Units	MDL START_ DATE	MDL END_ DATE	Reporting Level	Reporting Level START_ DATE	Reporting Level END_DATE
USGSKYSL	SSC_TOTAL	L02	ASTM (2002). Standard Test Methods for Determining Sediment Concentration in Water Samples, Method D3977-97(C) Suspended sediment is calculated from separately analyzed Sand and Fine Fractions, [SSC_TOTAL] = [SSC_SAND] + [SSC _FINE].	Sample is poured onto a 62 µm sieve into a dish. The coarse (sand) fraction retained on the sieve is transferred, dried at 103 C for 2-3 hours, then weighed. The fine fraction passing through the sieve is analyzed by the filtration method, using Whatman #934-AH glass-fiber crucible filters (1.5 µm pore size).	**0.5 ?**	mg/L	TBP	TBP	0.5	TBP	TBP
USGSKYSL	SSC_%FINE	L01	ASTM (2002). Standard Test Methods for Determining Sediment Concentration in Water Samples, Method D3977-97 (C), Percent of Suspended Sediment Particles Passing Through a 62 µm Sieve.	Metal sieve, 62 micron mesh size	**?????**	PCT	TBP	TBP	???	TBP	TBP
DEDNREC	TOC	L01	APHA (1999). Standard Methods for the Examination of Water and Wastewater (20th Edition) Method 5310 B, High Temperature Combustion Method.	---	0.4	mg C/L	TBP	TBP	3.0	TBP	TBP
DEDNREC	DOC	L01	APHA (1999). Standard Methods for the Examination of Water and Wastewater (20th Edition) Method 5310 B, High Temperature Combustion Method.	Encapsulated, pleated filter ??? cm-sq TBP surface area, 0.45 micron pore size	0.4	mg C/L	TBP	TBP	3.0	TBP	TBP
DEDNREC	TALK	L01	APHA (1999). Standard Methods for the Examination of Water and Wastewater (20th Edition) Method 2320 B, Titration Method.	---	**1?**	mg $CaCO_3$/L	---	---	1.0	TBP	TBP
DEDNREC	HARDNESS	L01	APHA (1999). Standard Methods for the Examination of Water and Wastewater (20th Edition) Method 2340 C, EDTA Titration Method. Automated?	---	0.2	mg $CaCO_3$/L	---	---	1.0	TBP	TBP
DEDNREC	TURB_NTU	L01	EPA Method 180.1, Rev. 2.0 (1993), Determination of Turbidity by Nephelometry.	---	**1?**	NTU	TBP	TBP	1	TBP	TBP
DEDNREC	CLW	L02	APHA (1999). Standard Methods for the Examination of Water and Wastewater (20th Edition) Method 4500-Cl^- E, Automated Ferricyanide Method.	---	1	mg/L	TBP	TBP	3	TBP	TBP
DEDNREC	CHLA	L03	EPA Method 445.0, Rev. 1.2 (1997), *In Vitro* Determination of Chlorophyll *a* and Pheophytin *a* in Marine and Freshwater Algae by Fluorescence.	Glass fiber plate, 47 mm diameter, 1 micron effective pore size	**0.2 ?**	µg/L	TBP	TBP	0.2	TBP	TBP

Field Blanks (FB): Revised Proposal for Frequency

Stations per Collection Group	Samples/WY	Blanks /WY	Proposed Distribution	Currently
1-2	20-40	4	Quarterly	
3-5	60-100	6	Every other month (minimum)	1/month
≥ 6	≥ 120	1 per station/year, up to 12 blanks/year	Every other month (minimum) to monthly	

Field Duplicates (FS1/FS2 or S1/S2): Revised Proposal for Frequency

Stations per Collection Group	Samples/WY	Duplicates/ WY	Distribution	Currently
1-2	20-40	4	Quarterly	1/month, or 1/20 samples
3-5	60-100	6-10 (2 per station/year)	Every other month (minimum)	
≥ 6	≥ 120	2 per station/year, up to 20 duplicates/year[1]	1 or more per month	

[1] Sample Collection Groups with 11 or more stations may limit the number of duplicates to 20/year

NTN Groups for Field Blank and Duplicate Sample Frequency Determinations

AGENCY	SOURCE	STATION_TYPE	EVENT_TYPE	STATIONS
DEDNREC	DEDNREC	Primary	R, RSI, S, ONS or OS	304191, 302031
USGSWV	USGSWV	Primary	R, RSI, S, ONS or OS	01604500, 01608500, 01616500, 01613030, 01616400, 01611500, 01618100
USGSWV	USGSWV	Primary	R, RSI, S, ONS or OS	01595300, 01614000, 01636500
SRBC	SRBC	Primary	R, RSI, S, ONS or OS	01502500, 01503000, 01529500, 01511500
SRBC	SRBC or NYSDEC	Primary	R, RSI, S, ONS or OS	01515000, 01531000
MDDNR	MDDNR	Primary	R, RSI, S, ONS or OS	TUK0181, BEL0053, DER0015, GUN0258, NPA0165, GWN0115, PXT0972, TF1.2, GEO0009, WIL0013, ANT0047, CAC0148, MON0546, LXT0200, MGN0062, NWA0016, WCK0001, MKB0016, CVA0046, WIL0065
MDDNR	USGSMD	Primary_RIM	R, RSI, S, ONS or OS	01491000, 01578310, 01594440, 01646580
PADEP	SRBC	Primary	R, RSI, S, ONS or OS	WQN0201, WQN0214, WQN0273, WQN0301, WQN0305, WQN0401, WQN0204, WQN0210, WQN0223, WQN0229, WQN0243, WQN0263, WQN0271, WQN0272, WQN0302, WQN0404, WQN0445, WQN0448, WQN0226, WQN0281, WQN0282

AGENCY	SOURCE	STATION_TYPE	EVENT_TYPE	STATIONS
PADEP	USGSPA	Primary	R, RSI, S, ONS or OS	WQN0317, WQN0410, WQN0224, WQN0217, WQN0212, WQN0269, WQN0278, WQN0280
PADEP	PADEP	Primary	R, RSI, S, ONS or OS	WQN0501, WQN0509, WQN0510, WQN0511, WQN0512, WQN0513
VADEQ	USGSVA	Primary_RIM	R, RSI, S, ONS or OS	TF5.0A, TF4.0P, TF5.0J, TF3.0, TF4.0M, 2-JMS113.20
VADEQ	USGSVA	Primary	R, RSI, S, ONS or OS	1BNFS010.34, 1BSMT004.60, 1BSSF003.56, 2-CHK035.26, 2-JMS113.20, 3-RAP030.21, 8-NAR005.42, 1BMDD005.81, 1ADIF000.86, 7-DRN010.48, 1ASOQ006.73
VADEQ	VADEQ/SCRO or USGSVA	Primary	R, RSI, S, ONS, or OS	2-JMS279.41, 2-APP110.93
VADEQ	VADEQ/NRO or USGSVA	Primary	R, RSI, S, ONS, or OS	1AACO014.57, 3-RPP147.49, 8-MPN094.94
VADEQ	VADEQ/VRO or USGSVA	Primary	R, RSI, S, ONS, or OS	2-RVN015.97, 1BSSF100.10
VADEQ	VADEQ/NRO	Secondary	R (but w possibly RSI flows) or ONS	3-RAP066.54, 3-ROB001.90, 8-POR008.97, 1ACAX004.57
VADEQ	VADEQ/VRO	Secondary	R (but w possibly RSI flows) or ONS	1BSTH027.85, 2-BCC004.71, 2-BLP000.79, 2-CFP004.67, 2-MCM005.12, 2-MRY014.78
VADEQ	VADEQ/PRO	Secondary	R (but w possibly RSI flows) or ONS	8-LTL009.54, 2-DPC005.20