

## CHAAP Data Verification

Laboratory and SDG#: TADenver 280-137512

AECOM Chemist: Jared DeSadier

Date Verified: 7/1/2020

AECOM ITR: Jeff Aust

Guidance: DoD QSM Version 5.1 (January 2017)

Applicable QAPP: Cornhusker Army Ammunition Plant QAPP (Brice and AECOM, October 2018)

Applicable Analytical Methods: 8330A, 353.2, 350.1, 351.2, RSK-175, 9060A, 2320B, 9056A, 9034

Sample Identification #	Date Collected	Date Received	Matrix	Analysis
CA211-20A	6/9/2020	6/10/2020	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
CA210-20A	6/9/2020	6/10/2020	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
NW071-20A	6/9/2020	6/10/2020	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
CA212-20A	6/9/2020	6/10/2020	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
NW082R-20A	6/9/2020	6/10/2020	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
NW070-20A	6/9/2020	6/10/2020	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
NW080-20A	6/9/2020	6/10/2020	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)
NW081R-20A	6/9/2020	6/10/2020	Water	Explosives (8330A), Nitrate, Nitrite (353.2), Ammonia (350.1), TKN (351.2), Methane (RSK-175), DOC (9060A), Sulfate (9056A), Alkalinity (2320B), Sulfide (9034)

### 1.0 Laboratory Case Narrative \ Cooler Receipt Form

Verification Criteria	Yes	No	N/A
Were any DoD QSM deviations noted in the laboratory case narrative?	X		
Were DoD QSM corrective actions followed if deviations were noted?	X		
Were any issues noted in the cooler receipt form?		X	

The case narrative indicated that some LCS/LCSD and MS/MSD recoveries were outside evaluation criteria and some analytes were detected in blank samples. These issues are discussed further in the ADR report.

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No other issues were noted in the case narrative or cooler receipt form.

### 2.0 Sample Documentation

Verification Criteria	Yes	No
Were all samples documented correctly on the chain-of-custody (COC) and samples labels?	X	
Were all sample identifications (IDs) documented correctly on sample labels?	X	
Did samples listed on COCs match the sample labels?	X	
Were samples relinquished properly on the COC?	X	

### 3.0 Initial Calibration

Method 8330A Initial Calibration Criteria			
<b>Instrument:</b>	<b>CHHPLC X3</b>		
<b>Date of Calibration:</b>	<b>3/4/2020</b>		
	<b>Yes</b>	<b>No</b>	<b>N/A</b>
Was at least a five point calibration completed for all analytes prior to sample analysis and one option below?	X		
Option 1: RSD for each analyte $\leq 20\%$ ?	X		
Option 2: If linear least squares regression was used was the $r^2 \geq 0.99$ ?			X
Option 3: If non-linear regression was used was the coefficient of determination $r^2 \geq 0.99$ ?			X
If non-linear regression was used were 6 points used for second order and 7 points for third order?			X

Method 8330A Initial Calibration Criteria			
<b>Instrument:</b>	<b>CHHPLC X3</b>		
<b>Date of Calibration:</b>	<b>3/18/2020</b>		
	<b>Yes</b>	<b>No</b>	<b>N/A</b>
Was at least a five point calibration completed for all analytes prior to sample analysis and one option below?	X		
Option 1: RSD for each analyte $\leq 20\%$ ?	X		
Option 2: If linear least squares regression was used was the $r^2 \geq 0.99$ ?			X
Option 3: If non-linear regression was used was the coefficient of determination $r^2 \geq 0.99$ ?			X
If non-linear regression was used were 6 points used for second order and 7 points for third order?			X

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Method RSK-175 Initial Calibration Criteria			
Instrument:	VGC J		
Date of Calibration:	5/16/2020		
	Yes	No	N/A
Was at least a five point calibration completed for all analytes prior to sample analysis and one option below?	X		
Option 1: RSD for each analyte $\leq 25\%$ ?	X		
Option 2: If linear least squares regression was used was the $r^2 \geq 0.99$ ?	X		
Option 3: If non-linear regression was used was the coefficient of determination $r^2 \geq 0.99$ ?			X
If non-linear regression was used were 6 points used for second order and 7 points for third order?			X

Method 9056A Initial Calibration Criteria			
Instrument:	WC IonChrom7		
Date of Calibration:	6/3/2020		
	Yes	No	N/A
Was a minimum of three standards and a calibration blank used for ICAL?	X		
Was $r^2 \geq 0.99$ ?	X		

Method 9056A Initial Calibration Criteria			
Instrument:	WC IonChrom7		
Date of Calibration:	6/24/2020		
	Yes	No	N/A
Was a minimum of three standards and a calibration blank used for ICAL?	X		
Was $r^2 \geq 0.99$ ?	X		

Method 350.1 Initial Calibration Criteria			
Instrument:	WC Alp 3		
Date of Calibration:	6/11/2020		
	Yes	No	N/A
Was a minimum of three standards and a calibration blank used for ICAL?	X		
Was $r^2 \geq 0.99$ ?	X		

Method 353.2 Initial Calibration Criteria			
Instrument:	WC Alp 2		
Date of Calibration:	6/15/2020		
	Yes	No	N/A
Was a minimum of three standards and a calibration blank used for ICAL?	X		
Was $r^2 \geq 0.99$ ?	X		

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Method 353.2 Initial Calibration Criteria			
Instrument:	WC Alp 2		
Date of Calibration:	6/16/2020		
	Yes	No	N/A
Was a minimum of three standards and a calibration blank used for ICAL?	X		
Was $r^2 \geq 0.99$ ?	X		

Method 351.2 Initial Calibration Criteria			
Instrument:	WC Astoria		
Date of Calibration:	6/19/2020		
	Yes	No	N/A
Was a minimum of three standards and a calibration blank used for ICAL?	X		
Was $r^2 \geq 0.99$ ?	X		

Method 9060A Initial Calibration Criteria			
Instrument:	WC SHI3		
Date of Calibration:	6/19/2020		
	Yes	No	N/A
Was a minimum of three standards and a calibration blank used for ICAL?	X		
Was $r^2 \geq 0.99$ ?	X		

### 4.0 Initial Calibration Verification [(ICV) Second Source]

Method 8330A ICV Criteria (Filename)			
Instrument:	03040033.D		
Date of Initial Calibration Verification:	CHHPLC_X3		
	3/5/2020		
	Yes	No	N/A
Was the ICV analyzed after each calibration?	X		
Was the ICV for all analytes within $\pm 15\%$ of the true value?	X		

Method 8330A ICV Criteria (Filename)			
Instrument:	03180016.D		
Date of Initial Calibration Verification:	CHHPLC_X3		
	3/18/2020		
	Yes	No	N/A
Was the ICV analyzed after each calibration?	X		
Was the ICV for all analytes within $\pm 15\%$ of the true value?	X		

Method RSK-175 ICV Criteria (Filename)			
Instrument:	010F1001.D		
Date of Initial Calibration Verification:	VGC_J		
	5/16/2020		
	Yes	No	N/A
Was the ICV analyzed after each calibration?	X		
Was the ICV for all analytes within $\pm 25\%$ of the true value?	X		

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Method 9056A ICV	WC IonChrom7		
Date of Initial Calibration Verification:	6/3/2020		
	Yes	No	N/A
Was the ICV analyzed after each ICAL, prior to the beginning of a sample analysis?	X		
Was the ICV for all analytes within $\pm 10\%$ of the true value?	X		

Method 9056A ICV	WC IonChrom7		
Date of Initial Calibration Verification:	6/24/2020		
	Yes	No	N/A
Was the ICV analyzed after each ICAL, prior to the beginning of a sample analysis?	X		
Was the ICV for all analytes within $\pm 10\%$ of the true value?	X		

Method 350.1 ICV Criteria	WC Alp 3		
Date of Initial Calibration Verification:	6/11/2020		
	Yes	No	N/A
Was the ICV analyzed after each ICAL, prior to the beginning of a sample analysis?	X		
Was the ICV for all analytes within $\pm 10\%$ of the true value?	X		

Method 353.2 ICV Criteria	WC Alp 2		
Date of Initial Calibration Verification:	6/15/2020		
	Yes	No	N/A
Was the ICV analyzed after each ICAL, prior to the beginning of a sample analysis?	X		
Was the ICV for all analytes within $\pm 10\%$ of the true value?	X		

Method 353.2 ICV Criteria	WC Alp 2		
Date of Initial Calibration Verification:	6/16/2020		
	Yes	No	N/A
Was the ICV analyzed after each ICAL, prior to the beginning of a sample analysis?	X		
Was the ICV for all analytes within $\pm 10\%$ of the true value?	X		

Method 351.2 ICV Criteria	WC Astoria		
Date of Initial Calibration Verification:	6/19/2020		
	Yes	No	N/A
Was the ICV analyzed after each ICAL, prior to the beginning of a sample analysis?	X		
Was the ICV for all analytes within $\pm 10\%$ of the true value?	X		

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Method 9060A ICV Criteria	WC_SHI3		
Date of Initial Calibration Verification:	6/19/2020		
	Yes	No	N/A
Was the ICV analyzed after each ICAL, prior to the beginning of a sample analysis?	X		
Was the ICV for all analytes within $\pm 10\%$ of the true value?	X		

### 5.0 Continuing Calibration Verification (CCV)

Method 8330A CCV Criteria (Filename)	06120057-9.D		
Instrument:	CHHPLC_X3		
Date of Calibration Verification:	6/13/2020		
	Yes	No	N/A
Was the CCV analyzed daily before sample analysis?	X		
Was the CCV analyzed every 10 field samples and at the end of the analysis sequence?	X		
Was the CCV for all analytes within $\pm 15\%$ of the true value?	X		

Method 8330A CCV Criteria (Filename)	06120071-3.D		
Instrument:	CHHPLC_X3		
Date of Calibration Verification:	6/13/2020		
	Yes	No	N/A
Was the CCV analyzed daily before sample analysis?	X		
Was the CCV analyzed every 10 field samples and at the end of the analysis sequence?	X		
Was the CCV for all analytes within $\pm 15\%$ of the true value?	X		

Method 8330A CCV Criteria (Filename)	06120076-8.D		
Instrument:	CHHPLC_X3		
Date of Calibration Verification:	6/13/2020		
	Yes	No	N/A
Was the CCV analyzed daily before sample analysis?	X		
Was the CCV analyzed every 10 field samples and at the end of the analysis sequence?	X		
Was the CCV for all analytes within $\pm 15\%$ of the true value?	X		

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<b>Method 8330A CCV Criteria (Filename)</b>	<b>06240032-3.D</b>		
<b>Instrument:</b>	<b>CHHPLC X3</b>		
<b>Date of Calibration Verification:</b>	<b>6/25/2020</b>		
	<b>Yes</b>	<b>No</b>	<b>N/A</b>
Was the CCV analyzed daily before sample analysis?	X		
Was the CCV analyzed every 10 field samples and at the end of the analysis sequence?	X		
Was the CCV for all analytes within $\pm 15\%$ of the true value?	X		

<b>Method 8330A CCV Criteria (Filename)</b>	<b>06240044-5.D</b>		
<b>Instrument:</b>	<b>CHHPLC X3</b>		
<b>Date of Calibration Verification:</b>	<b>6/25/2020</b>		
	<b>Yes</b>	<b>No</b>	<b>N/A</b>
Was the CCV analyzed daily before sample analysis?	X		
Was the CCV analyzed every 10 field samples and at the end of the analysis sequence?	X		
Was the CCV for all analytes within $\pm 15\%$ of the true value?	X		

<b>Method 8330A CCV Criteria (Filename)</b>	<b>06240056-7.D</b>		
<b>Instrument:</b>	<b>CHHPLC X3</b>		
<b>Date of Calibration Verification:</b>	<b>6/25/2020</b>		
	<b>Yes</b>	<b>No</b>	<b>N/A</b>
Was the CCV analyzed daily before sample analysis?	X		
Was the CCV analyzed every 10 field samples and at the end of the analysis sequence?	X		
Was the CCV for all analytes within $\pm 15\%$ of the true value?	X		

<b>Method RSK-175 CCV Criteria (Filename)</b>	<b>032F2501.D</b>		
<b>Instrument:</b>	<b>VGC J</b>		
<b>Date of Calibration Verification:</b>	<b>6/13/2020</b>		
	<b>Yes</b>	<b>No</b>	<b>N/A</b>
Was the CCV analyzed daily before sample analysis?	X		
Was the CCV analyzed every 10 field samples and at the end of the analysis sequence?	X		
Was the CCV for all analytes within $\pm 25\%$ of the true value?	X		

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<b>Method RSK-175 CCV Criteria (Filename)</b>	<b>049F4201.D</b>		
<b>Instrument:</b>	<b>VGC J</b>		
<b>Date of Calibration Verification:</b>	<b>6/14/2020</b>		
	<b>Yes</b>	<b>No</b>	<b>N/A</b>
Was the CCV analyzed daily before sample analysis?	X		
Was the CCV analyzed every 10 field samples and at the end of the analysis sequence?	X		
Was the CCV for all analytes within $\pm 25\%$ of the true value?	X		

<b>Method RSK-175 CCV Criteria (Filename)</b>	<b>021F2201.D</b>		
<b>Instrument:</b>	<b>VGC J</b>		
<b>Date of Calibration Verification:</b>	<b>6/16/2020</b>		
	<b>Yes</b>	<b>No</b>	<b>N/A</b>
Was the CCV analyzed daily before sample analysis?	X		
Was the CCV analyzed every 10 field samples and at the end of the analysis sequence?	X		
Was the CCV for all analytes within $\pm 25\%$ of the true value?	X		

<b>Method RSK-175 CCV Criteria (Filename)</b>	<b>033F3601.D</b>		
<b>Instrument:</b>	<b>VGC J</b>		
<b>Date of Calibration Verification:</b>	<b>6/16/2020</b>		
	<b>Yes</b>	<b>No</b>	<b>N/A</b>
Was the CCV analyzed daily before sample analysis?	X		
Was the CCV analyzed every 10 field samples and at the end of the analysis sequence?	X		
Was the CCV for all analytes within $\pm 25\%$ of the true value?	X		

<b>Method RSK-175 CCV Criteria (Filename)</b>	<b>031F3101.D</b>		
<b>Instrument:</b>	<b>VGC J</b>		
<b>Date of Calibration Verification:</b>	<b>6/18/2020</b>		
	<b>Yes</b>	<b>No</b>	<b>N/A</b>
Was the CCV analyzed daily before sample analysis?	X		
Was the CCV analyzed every 10 field samples and at the end of the analysis sequence?	X		
Was the CCV for all analytes within $\pm 25\%$ of the true value?	X		



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Method RSK-175 CCV Criteria (Filename)	048F4801.D		
Instrument:	VGC J		
Date of Calibration Verification:	6/18/2020		
	Yes	No	N/A
Was the CCV analyzed daily before sample analysis?	X		
Was the CCV analyzed every 10 field samples and at the end of the analysis sequence?	X		
Was the CCV for all analytes within $\pm 25\%$ of the true value?	X		

Method 9056A, Instrument: WC_IonChrom7, All CCVs on 6/3/2020	Yes	No
Was a CCV analyzed after every 10 field samples and at the end of the analysis sequence?	X	
Were the CCVs for all analytes within $\pm 10\%$ of the true value?	X	

Method 9056A, Instrument: WC_IonChrom7, All CCVs on 6/24/2020	Yes	No
Was a CCV analyzed after every 10 field samples and at the end of the analysis sequence?	X	
Were the CCVs for all analytes within $\pm 10\%$ of the true value?	X	

Method 350.1, Instrument: WC_Alp 3, All CCVs on 6/11/2020	Yes	No
Was a CCV analyzed after every 10 field samples and at the end of the analysis sequence?	X	
Were the CCVs for all analytes within $\pm 10\%$ of the true value?	X	

Method 353.2, Instrument: WC_Alp 2, All CCVs on 6/15/2020	Yes	No
Was a CCV analyzed after every 10 field samples and at the end of the analysis sequence?	X	
Were the CCVs for all analytes within $\pm 10\%$ of the true value?	X	

Method 353.2, Instrument: WC_Alp 2, All CCVs on 6/16/2020	Yes	No
Was a CCV analyzed after every 10 field samples and at the end of the analysis sequence?	X	
Were the CCVs for all analytes within $\pm 10\%$ of the true value?	X	

Method 351.2, Instrument: WC_Astoria, All CCVs on 6/19/2020	Yes	No
Was a CCV analyzed after every 10 field samples and at the end of the analysis sequence?	X	
Were the CCVs for all analytes within $\pm 10\%$ of the true value?	X	

Method 9060A, Instrument: WC_SHI3, All CCVs on 6/19/2020	Yes	No
Was a CCV analyzed after every 10 field samples and at the end of the analysis sequence?	X	
Were the CCVs for all analytes within $\pm 10\%$ of the true value?	X	

### 6.0 Sensitivity

Sensitivity Criteria	Yes	No	N/A
Was the laboratory sensitivity consistent with project (QAPP) requirements?	X		
Did all analytes meet sensitivity requirements?	X		

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## 7.0 Additional Qualifications

Additional Qualification Criteria	Yes	No	N/A
Were common laboratory contaminants detected?		X	
Was professional judgment used to qualify data (if yes, list below)?		X	

## 8.0 Completeness

Completeness Criteria	Yes	No	N/A
Were any data rejected during the verification process?		X	
Were any samples lost, broken, or in any other manner in not verified?		X	
Were requested sample analyses performed, the correct analyte lists used, and correct sample preparation and analyses methods and units utilized?	X		