

APPENDIX C.4

GROUNDWATER CHEMISTRY TESTS

NORTH ANNA COL

**DATA REPORT REV. 0
JANUARY 23, 2007**

MACTEC PROJECT NO. 6468-06-1472



**DOCUMENTATION OF TECHNICAL REVIEW
SUBCONTRACTOR WORK PRODUCT**

Project Name: North Anna COL

Project Number: 6468-06-1472

Project Manager: Steve Criscenzo

Project Principal: Al Tice

The report described below has been prepared by the named subcontractor retained in accordance with the MACTEC QAPD. The work and report have been reviewed by a MACTEC technically qualified person. Comments on the work or report, if any, have been satisfactorily addressed by the subcontractor. The attached report is approved in accordance with section QS-7 of MACTEC's QAPD

The information and data contained in the attached report are hereby released by MACTEC for project use.

REPORT : Analytical Report Project No. 6468-06-1472, North Anna, Lot #: F6K290160

January 4, 2007

SUBCONTRACTOR: Severn Trent Laboratories, Inc. (STL St. Louis)

DATE OF ACCEPTANCE : January 4, 2007

TECHNICAL REVIEWER: Wythe A. Shi

PROJECT PRINCIPAL : J. Allan Tice

Note: Samples from OW 946 and 949/A2 1-19-07

DCN NA COL- 192



3301 Atlantic Avenue, Raleigh, NC 27604

Client Dominion PowerLaboratory STL - St. LouisMACTEC Project 6468-06-1472Data Report Number/Date lot # F6 K29016 / 1-2-07
1-4-2007
1-19-07**LABORATORY DATA REVIEW CHECKLIST**

	<u>YES</u>	<u>NO</u>	<u>NOT APPLICABLE</u>
1. Laboratory analytical data report appears complete (all data results present for all samples submitted for analysis) and there are no apparent transcription errors:	☒	☐	☐
2. Samples analyzed within applicable holding times (based on date of sample collection):*	☒	☐	☐
3. Trip blanks, field blanks or laboratory method blanks are free of blank contamination:	☐	☒ ①	☐
4. If field duplicate samples collected, calculated results meet Relative Percent Difference guidelines: **	☐	☐	☒
5. Surrogate recoveries (organic analyses only) within laboratory reported recovery acceptance ranges:	☐	☐	☒
6. If Matrix Spike/Matrix Spike Duplicate (MS/MSD) samples required to meet project objectives, Percent Recoveries (%R) and Relative Percent Difference (RPD) within laboratory reported acceptance ranges:	☐	☒ ②	☐
7. Reported detection limits meet project objectives (e.g., are capable of achieving applicable site standards):	☒	☐	☐
8. Completed Chain-Of-Custody received noting sample/custody seal condition (with airbill, if appropriate):	☒	☐	☐
9. Analytical costs within authorized budget for these services:	☒	☐	☐

COMMENTS: ① Fluoride detected in samples and method blank @ concentrations below reporting limit but above MDLs

② MS + MSD samples failed QC recoveries b/c of matrix interference. QC passed on LC + LLS samples.

Notes: 1. This checklist is intended for use with the laboratory reporting formats typical of most projects. If "no" is answered to one or more of the above checklist questions 1 through 7, a more detailed Data Validation may be required, and a person knowledgeable in Data Validation protocols should be consulted. This checklist should not be used if the project scope requires Data Validation from the onset.

2. * = Based upon EPA Guidance and the applicable analytical method references. See reverse side of checklist for details.

3. ** = Based upon EPA Guidance. Use these criteria on duplicate and sample results which exceed five times the reported detection limit. See reverse side of checklist for details.

Checked by: William A. Smith Date: 1-19-07



STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Tel: 314 298 8566 Fax: 314 298 8757
www.stl-inc.com

ANALYTICAL REPORT

NORTH ANNA

Lot #: F6K290160

J. Allan Tyce

MACTEC Engineering & Consultin
3301 Atlantic Ave
Raleigh, NC 27604

SEVERN TRENT LABORATORIES, INC.


Terry Romanko
Project Manager

January 4, 2007

DCN NA COL 190

Case Narrative
LOT NUMBER: F6K290160

This report contains the analytical results for the two samples received under chain of custody by STL St. Louis on November 29, 2006. These samples are associated with your NORTH ANNA project.

The analytical results included in this report meet all applicable quality control procedure requirements except as noted on the following page.

The test results in this report meet all NELAP requirements for parameters in which accreditations are held by STL St. Louis. Any exceptions to NELAP requirements are noted in the case narrative. The case narrative is an integral part of this report.

All chemical analysis results are based upon sample as received, wet weight, unless noted otherwise. All radiochemistry results are based upon sample as dried and ground with the exception of tritium, unless requested wet weight by the client.

Observations/Nonconformances

Reference the chain of custody and condition upon receipt report for any variations on receipt conditions and temperature of samples on receipt.

Anions (Bromide, Chloride, Fluoride, Sulfate) (MCAWW 300.0A)

The anion matrix spike solution contains all routine anions. Poor matrix spike recovery for Bromide in batch 6361318 and Fluoride in batch 6361320 is attributed to matrix interference. Spiking technique, sample preparation and method compliance is demonstrated by the remaining acceptable MS recoveries.

Affected Samples:

F6K290160 (1): 0W-949

F6K290160 (2): 0W-946

Nitrate-Nitrite (MCAWW 353.1)

When performing a sample dilution due to matrix interference, the surrogates and/or matrix spike compounds were diluted below reliable detection, making QC recoveries unreliable. A LCS and LCSD were performed to display precision and accuracy.

Affected Samples:

F6K290160 (1): 0W-949

There were no nonconformances or observations noted with any other analysis on this lot.

METHODS SUMMARY

F6K290160

<u>PARAMETER</u>	<u>ANALYTICAL METHOD</u>	<u>PREPARATION METHOD</u>
Alkalinity	MCAWW 310.1	MCAWW 310.1
Bromide	MCAWW 300.0A	MCAWW 300.0A
Chloride	MCAWW 300.0A	MCAWW 300.0A
Filterable Residue (TDS)	MCAWW 160.1	MCAWW 160.1
Fluoride	MCAWW 300.0A	MCAWW 300.0A
Nitrate-Nitrite	MCAWW 353.1	
Nitrogen, Ammonia	MCAWW 350.1	MCAWW 350.1
Sulfate	MCAWW 300.0A	MCAWW 300.0A

References:

MCAWW "Methods for Chemical Analysis of Water and Wastes",
EPA-600/4-79-020, March 1983 and subsequent revisions.

SAMPLE SUMMARY

F6K290160

<u>WO #</u>	<u>SAMPLE#</u>	<u>CLIENT SAMPLE ID</u>	<u>SAMPLED DATE</u>	<u>SAMP TIME</u>
JKGJT	001	OW-949	11/28/06	15:30
JKGWD	002	OW-946	11/28/06	17:15

NOTE(S) :

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

MACTEC Engineering and Consulting Inc

Client Sample ID: OW-949

General Chemistry

Lot-Sample #....: F6K290160-001 Work Order #....: JKGJT Matrix.....: WATER
 Date Sampled....: 11/28/06 15:30 Date Received...: 11/29/06

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Bromide	ND	0.25	mg/L	MCAWW 300.0A	12/26/06	6361318
		Dilution Factor: 1		Analysis Time...: 02:34		
Chloride	2.3	0.20	mg/L	MCAWW 300.0A	12/26/06	6361319
		Dilution Factor: 1		Analysis Time...: 02:34		
Fluoride	0.094 B,J	0.10	mg/L	MCAWW 300.0A	12/26/06	6361320
		Dilution Factor: 1		Analysis Time...: 02:34		
Nitrate/Nitrite as N	0.52	0.050	mg/L	MCAWW 353.1	12/04/06	6339055
		Dilution Factor: 1		Analysis Time...: 00:00		
Nitrogen, as Ammonia	ND	0.050	mg/L	MCAWW 350.1	12/07/06	6341275
		Dilution Factor: 1		Analysis Time...: 00:00		
Sulfate	2.9	0.50	mg/L	MCAWW 300.0A	12/26/06	6361321
		Dilution Factor: 1		Analysis Time...: 02:34		
Total Alkalinity	38.0	5.0	mg/L	MCAWW 310.1	12/11-12/13/06	6345302
		Dilution Factor: 1		Analysis Time...: 00:00		
Total Dissolved Solids	93.0	5.0	mg/L	MCAWW 160.1	12/02/06	6336108
		Dilution Factor: 1		Analysis Time...: 00:00		

NOTE(S) :

RL Reporting Limit

B Estimated result. Result is less than RL.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

MACTEC Engineering and Consulting Inc

Client Sample ID: OW-946

General Chemistry

Lot-Sample #...: F6K290160-002 Work Order #...: JKGWD Matrix.....: WATER
 Date Sampled...: 11/28/06 17:15 Date Received...: 11/29/06

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Bromide	ND	0.25	mg/L	MCAWW 300.0A	12/26/06	6361318
		Dilution Factor: 1		Analysis Time...: 04:25		
Chloride	1.5	0.20	mg/L	MCAWW 300.0A	12/26/06	6361319
		Dilution Factor: 1		Analysis Time...: 04:25		
Fluoride	0.027 B,J	0.10	mg/L	MCAWW 300.0A	12/26/06	6361320
		Dilution Factor: 1		Analysis Time...: 04:25		
Nitrate/Nitrite as N	0.065	0.050	mg/L	MCAWW 353.1	12/06/06	6345250
		Dilution Factor: 1		Analysis Time...: 00:00		
Nitrogen, as Ammonia	ND	0.050	mg/L	MCAWW 350.1	12/07/06	6341275
		Dilution Factor: 1		Analysis Time...: 00:00		
Sulfate	0.69	0.50	mg/L	MCAWW 300.0A	12/26/06	6361321
		Dilution Factor: 1		Analysis Time...: 04:25		
Total Alkalinity	22.0	5.0	mg/L	MCAWW 310.1	12/11-12/13/06	6345302
		Dilution Factor: 1		Analysis Time...: 00:00		
Total Dissolved Solids	64.0	5.0	mg/L	MCAWW 160.1	12/02/06	6336108
		Dilution Factor: 1		Analysis Time...: 00:00		

NOTE(S) :

RL Reporting Limit

B Estimated result. Result is less than RL.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

METHOD BLANK REPORT

General Chemistry

Client Lot #....: F6K290160

Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Bromide	ND	Work Order #: JL74T1AA 0.25	mg/L	MB Lot-Sample #: F6L270000-318 MCAWW 300.0A	12/26/06	6361318
		Dilution Factor: 1 Analysis Time...: 01:31				
Chloride	ND	Work Order #: JL7401AA 0.20	mg/L	MB Lot-Sample #: F6L270000-319 MCAWW 300.0A	12/26/06	6361319
		Dilution Factor: 1 Analysis Time...: 01:31				
Fluoride	0.027 B	Work Order #: JL75A1AA 0.10	mg/L	MB Lot-Sample #: F6L270000-320 MCAWW 300.0A	12/26/06	6361320
		Dilution Factor: 1 Analysis Time...: 01:31				
Nitrate/Nitrite as N	ND	Work Order #: JKREL1AA 0.050	mg/L	MB Lot-Sample #: F6L050000-055 MCAWW 353.1	12/04/06	6339055
		Dilution Factor: 1 Analysis Time...: 00:00				
Nitrate/Nitrite as N	ND	Work Order #: JK7VE1AA 0.050	mg/L	MB Lot-Sample #: F6L110000-250 MCAWW 353.1	12/06/06	6345250
		Dilution Factor: 1 Analysis Time...: 00:00				
Nitrogen, as Ammonia	ND	Work Order #: JK04Q1AA 0.050	mg/L	MB Lot-Sample #: F6L070000-275 MCAWW 350.1	12/07/06	6341275
		Dilution Factor: 1 Analysis Time...: 00:00				
Sulfate	ND	Work Order #: JL75H1AA 0.50	mg/L	MB Lot-Sample #: F6L270000-321 MCAWW 300.0A	12/26/06	6361321
		Dilution Factor: 1 Analysis Time...: 01:31				
Total Alkalinity	ND	Work Order #: JLCRH1AA 5.0	mg/L	MB Lot-Sample #: F6L110000-302 MCAWW 310.1	12/11-12/13/06	6345302
		Dilution Factor: 1 Analysis Time...: 00:00				
Total Dissolved Solids	ND	Work Order #: JLMRX1AA 5.0	mg/L	MB Lot-Sample #: F6L020000-108 MCAWW 160.1	12/02/06	6336108
		Dilution Factor: 1 Analysis Time...: 00:00				

(Continued on next page)

METHOD BLANK REPORT

General Chemistry

Client Lot #...: F6K290160

Matrix.....: WATER

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

B Estimated result. Result is less than RL.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

General Chemistry

Lot-Sample #....: F6K290160

Matrix.....: WATER

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD LIMITS	RPD LIMITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #	
Bromide		WO#:JL74T1AC-LCS/JL74T1AD-LCSD LCS Lot-Sample#: F6L270000-318						
	100	(90 - 110)			MCAWW 300.0A	12/26/06	6361318	
	94	(90 - 110)	5.9	(0-20)	MCAWW 300.0A	12/26/06	6361318	
		Dilution Factor: 1		Analysis Time...: 01:12				
Chloride		WO#:JL7401AC-LCS/JL7401AD-LCSD LCS Lot-Sample#: F6L270000-319						
	96	(90 - 110)			MCAWW 300.0A	12/26/06	6361319	
	90	(90 - 110)	6.1	(0-20)	MCAWW 300.0A	12/26/06	6361319	
		Dilution Factor: 1		Analysis Time...: 01:12				
Fluoride		WO#:JL75A1AC-LCS/JL75A1AD-LCSD LCS Lot-Sample#: F6L270000-320						
	96	(90 - 110)			MCAWW 300.0A	12/26/06	6361320	
	96	(90 - 110)	0.07	(0-20)	MCAWW 300.0A	12/26/06	6361320	
		Dilution Factor: 1		Analysis Time...: 01:12				
Nitrate/Nitrite as N		WO#:JKREL1AC-LCS/JKREL1AD-LCSD LCS Lot-Sample#: F6L050000-055						
	108	(90 - 110)			MCAWW 353.1	12/04/06	6339055	
	107	(90 - 110)	0.82	(0-20)	MCAWW 353.1	12/04/06	6339055	
		Dilution Factor: 1		Analysis Time...: 00:00				
Nitrate/Nitrite as N		WO#:JK7VE1AC-LCS/JK7VE1AD-LCSD LCS Lot-Sample#: F6L110000-250						
	99	(90 - 110)			MCAWW 353.1	12/06/06	6345250	
	101	(90 - 110)	1.8	(0-20)	MCAWW 353.1	12/06/06	6345250	
		Dilution Factor: 1		Analysis Time...: 00:00				
Sulfate		WO#:JL75H1AC-LCS/JL75H1AD-LCSD LCS Lot-Sample#: F6L270000-321						
	97	(90 - 110)			MCAWW 300.0A	12/26/06	6361321	
	90	(90 - 110)	7.3	(0-20)	MCAWW 300.0A	12/26/06	6361321	
		Dilution Factor: 1		Analysis Time...: 01:12				
Total Alkalinity		WO#:JLCRH1AC-LCS/JLCRH1AD-LCSD LCS Lot-Sample#: F6L110000-302						
	99	(90 - 110)			MCAWW 310.1	12/11-12/13/06	6345302	
	99	(90 - 110)	0.0	(0-15)	MCAWW 310.1	12/11-12/13/06	6345302	
		Dilution Factor: 1		Analysis Time...: 00:00				
Total Dissolved Solids		WO#:JLMRX1AC-LCS/JLMRX1AD-LCSD LCS Lot-Sample#: F6L020000-108						
	102	(90 - 110)			MCAWW 160.1	12/02/06	6336108	
	102	(90 - 110)	0.39	(0-15)	MCAWW 160.1	12/02/06	6336108	
		Dilution Factor: 1		Analysis Time...: 00:00				

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LABORATORY CONTROL SAMPLE EVALUATION REPORT

General Chemistry

Lot-Sample #...: F6K290160

Matrix.....: WATER

<u>PARAMETER</u>	<u>PERCENT</u> <u>RECOVERY</u>	<u>RECOVERY</u> <u>LIMITS</u>	<u>RPD</u> <u>LIMITS</u>	<u>METHOD</u>	<u>PREPARATION-</u> <u>ANALYSIS DATE</u>	<u>PREP</u> <u>BATCH #</u>
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NOTE (S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

General Chemistry

Client Lot #....: F6K290160

Matrix.....: WATER

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>PREP BATCH #</u>
Nitrogen, as Ammonia	98	Work Order #: JK04Q1AC (90 - 110)	LCS Lot-Sample#: F6L070000-275 MCAWW 350.1	12/07/06	6341275
		Dilution Factor: 1	Analysis Time...: 00:00		

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE EVALUATION REPORT

General Chemistry

Client Lot #....: F6K290160

Matrix.....: WATER

Date Sampled...: 11/17/06 09:40 Date Received...: 11/18/06

PARAMETER	PERCENT RECOVERY	RPD	PREPARATION-	PREP
	RECOVERY LIMITS	RPD LIMITS	ANALYSIS DATE	BATCH #
Nitrogen, as Ammonia	WO#: JJ28E1E9-MS/JJ28E1FA-MSD	MS	Lot-Sample #: F6K180200-001	
102	(90 - 110)		12/07/06	6341275
100	(90 - 110)	1.5 (0-20)	12/07/06	6341275
	Dilution Factor: 1			
	Analysis Time...: 00:00			

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

N Spiked analyte recovery is outside stated control limits.

MATRIX SPIKE SAMPLE EVALUATION REPORT

General Chemistry

Client Lot #....: F6K290160

Matrix.....: WATER

Date Sampled....: 11/28/06 15:30 Date Received...: 11/29/06

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Bromide	199 N	Work Order #....: JKGJT1AM (90 - 110)	MCAWW 300.0A	MS Lot-Sample #: F6K290160-001 12/26/06	6361318
		Dilution Factor: 1		Analysis Time...: 02:34	
Chloride	99	Work Order #....: JKGJT1AP (90 - 110)	MCAWW 300.0A	MS Lot-Sample #: F6K290160-001 12/26/06	6361319
		Dilution Factor: 1		Analysis Time...: 02:34	
Fluoride	0 N	Work Order #....: JKGJT1AR (90 - 110)	MCAWW 300.0A	MS Lot-Sample #: F6K290160-001 12/26/06	6361320
		Dilution Factor: 1		Analysis Time...: 02:34	
Nitrate/Nitrite as N	1130 N	Work Order #....: JKGRQ1CU (90 - 110)	MCAWW 353.1	MS Lot-Sample #: F6K290183-003 12/04/06	6339055
		Dilution Factor: 10		Analysis Time...: 00:00	
Sulfate	91	Work Order #....: JKGJT1AU (90 - 110)	MCAWW 300.0A	MS Lot-Sample #: F6K290160-001 12/26/06	6361321
		Dilution Factor: 1		Analysis Time...: 02:34	
Total Alkalinity	96	Work Order #....: JKGJT1AK (50 - 121)	MCAWW 310.1	MS Lot-Sample #: F6K290160-001 12/11-12/13/06	6345302
		Dilution Factor: 1		Analysis Time...: 00:00	

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

N Spiked analyte recovery is outside stated control limits.

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #...: F6K290160

Work Order #...: JKGRQ-SMP
JKGRQ-DUP

Matrix.....: WATER

Date Sampled...: 11/28/06 10:40 Date Received...: 11/29/06

<u>PARAM</u>	<u>RESULT</u>	<u>DUPLICATE</u> <u>RESULT</u>	<u>UNITS</u>	<u>RPD</u> <u>RPD</u>	<u>RPD</u> <u>LIMIT</u>	<u>METHOD</u>	<u>PREPARATION-</u> <u>ANALYSIS DATE</u>	<u>PREP</u> <u>BATCH #</u>
Total Dissolved Solids						SD Lot-Sample #: F6K290183-003		
	307	302	mg/L	1.6	(0-15)	MCAWW 160.1	12/02/06	6336108
			Dilution Factor: 1			Analysis Time...: 00:00		
Nitrate/Nitrite as N						SD Lot-Sample #: F6K290183-003		
	4.4	4.4	mg/L	1.8	(0-20)	MCAWW 353.1	12/04/06	6339055
			Dilution Factor: 10			Analysis Time...: 00:00		

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #....: F6K290160

Work Order #....: JKGJT-SMP
JKGJT-DUP

Matrix.....: WATER

Date Sampled....: 11/28/06 15:30 Date Received...: 11/29/06

PARAM	RESULT	DUPLICATE RESULT	UNITS	RPD	RPD LIMIT	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Bromide	ND	ND	mg/L	0	(0-20)	SD Lot-Sample #: F6K290160-001 MCAWW 300.0A	12/26/06	6361318
			Dilution Factor: 1			Analysis Time...: 02:34		
Chloride	2.3	2.3	mg/L	0.18	(0-20)	SD Lot-Sample #: F6K290160-001 MCAWW 300.0A	12/26/06	6361319
			Dilution Factor: 1			Analysis Time...: 02:34		
Fluoride	0.094 B,J	0.11	mg/L	14	(0-20)	SD Lot-Sample #: F6K290160-001 MCAWW 300.0A	12/26/06	6361320
			Dilution Factor: 1			Analysis Time...: 02:34		
Sulfate	2.9	2.9	mg/L	0.91	(0-20)	SD Lot-Sample #: F6K290160-001 MCAWW 300.0A	12/26/06	6361321
			Dilution Factor: 1			Analysis Time...: 02:34		
Total Alkalinity	38.0	39.0	mg/L	2.6	(0-20)	SD Lot-Sample #: F6K290160-001 MCAWW 310.1	12/11-12/13/06	6345302
			Dilution Factor: 1			Analysis Time...: 00:00		

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

B Estimated result. Result is less than RL.

J Method blank contamination. The associated method blank contains the target analyte at a reportable level.

ORIGINAL -- RETURN TO LABORATORY WITH SAMPLE(S)

- 5176 -

Condition Upon Receipt Form

Client: Mactec COC/RFA No: _____ Date: 11/29/06
Quote No: 71966 Initiated By: BA Time: 0800

Shipping Information

Shipper Name: FE Multiple Packages Y N N/A
Shipping # (s):* _____ Sample Temperature (s):** _____
1. 8582 4347 6023 6. _____ 1. 3 6. _____
2. _____ 7. _____ 2. _____ 7. _____
3. _____ 8. _____ 3. _____ 8. _____
4. _____ 9. _____ 4. _____ 9. _____
5. _____ 10. _____ 5. _____ 10. _____

*Numbered shipping lines correspond to Numbered Sample Temp lines

**Sample must be received at 4°C ± 2°C- If not, note contents below. Temperature variance does NOT affect the following: Metals-Liquid or Rad tests- Liquid or Solids

Condition (Circle "Y" for yes, "N" for no and "N/A" for not applicable):

1.	Y <u>N</u>	Was sample received broken?	8.	Y <u>N</u>	Sample received with Chain of Custody?
2.	Y <u>N</u> N/A	Was sample received with proper pH? (If not, make note below)	9.	Y <u>N</u>	Chain of Custody matches sample ID's on container(s)?
3.	Y <u>N</u>	If N/A-Was pH taken by original STL Lab? <u>u/L</u>	10.	Y <u>N</u>	Are there custody seals present on cooler?
4.	Y <u>N</u>	Sample received in proper containers?	11.	Y <u>N</u> N/A	Do custody seals on cooler appear to be tampered with?
5.	Y <u>N</u>	Sample volume sufficient for analysis?	12.	Y <u>N</u>	Are there custody seals present on bottles?
6.	Y <u>N</u> N/A	Headspace in VOA or TOX liquid samples? (If Yes, note sample ID's below)	13.	Y <u>N</u> N/A	Do custody seals on bottles appear to be tampered with?
7.	Y <u>N</u>	Were contents of the cooler frisked after opening	14.	Y <u>N</u> N/A	Was Internal COC/Workshare received?

1 For DOE-AL (Pantex, LANL, Sandia) sites, pH of ALL containers received must be verified, EXCEPT VOA, TOX and soils.

Notes:

Corrective Action:

☐ Client Contact Name: _____ Informed by: _____
☐ Sample(s) processed "as is"
☐ Sample(s) on hold until: _____ If released, notify: _____

Project Management Review: X. Oliver Date: 12-01-06

THIS FORM MUST BE COMPLETED AT THE TIME THE ITEMS ARE BEING CHECKED IN. IF ANY ITEM IS COMPLETED BY SOMEONE OTHER THAN THE INITIATOR, THEN THAT PERSON IS REQUIRED TO APPLY THEIR INITIAL AND THE DATE NEXT TO THAT ITEM.

ADMIN-0004, REVISED 03/01/06\\Slsr01\QA\FORMS\ST-LOUIS\ADMIN\Admin004030106.doc

F6K290160**CLIENT ANALYSIS SUMMARY**

Storage Loc:

2-100

Project Manager: TJR

Quote #: 71966

SDG:

Date Received:

2006-11-29

Project:

NORTH ANNA

Analytical Due Date:

2006-12-11

O#: 66813

Report to: Mike Depalma

Report Due Date:

2006-12-13

Client: 373886 MACTEC Engineering and Consulting Inc

Report Type: B

Standard Report

#SMPS in LOT: 2

EDD Code: 00

SAMPLE #		CLIENT SAMPLE ID		DATE/TIME SAMPLED		WORKORDER		I	
1		0W-949		2006-11-28 / 1530		JKGJT		WATER	
SAMPLE COMMENTS:									
XX	AK	MCAW 160.1 W	Solids, Filterable "TDS" (160.1)	88	NO SAMPLE PREPARATION PERFORMED / DIRECT	01	STANDARD TEST SET	PROT: A	WRK LOC 06
XX	C8	MCAW 300.0A W	Fluoride (300.0A, Ion Chromatography)	88	NO SAMPLE PREPARATION PERFORMED / DIRECT	01	STANDARD TEST SET	PROT: A	WRK LOC 06
XX	CX	MCAW 300.0A W	Chloride (300.0A, Ion Chromatography)	88	NO SAMPLE PREPARATION PERFORMED / DIRECT	01	STANDARD TEST SET	PROT: A	WRK LOC 06
XX	CY	MCAW 300.0A W	Sulfate (300.0A, Ion Chromatography)	88	NO SAMPLE PREPARATION PERFORMED / DIRECT	01	STANDARD TEST SET	PROT: A	WRK LOC 06
XX	GM	MCAW 300.0A W	Bromide (300.0A, Ion Chromatography)	88	NO SAMPLE PREPARATION PERFORMED / DIRECT	01	STANDARD TEST SET	PROT: A	WRK LOC 06
XX	HN	MCAW 353.1 W	Nitrate-Nitrite (353.1)	23	REDUCTION	01	STANDARD TEST SET	PROT: A	WRK LOC 06
XX	VC	MCAW 310.1 W	Alkalinity, Total (310.1)	88	NO SAMPLE PREPARATION PERFORMED / DIRECT	01	STANDARD TEST SET	PROT: A	WRK LOC 06
XX	VM	MCAW 350.1 W	Nitrogen, Ammonia (350.1, Automated)	88	NO SAMPLE PREPARATION PERFORMED / DIRECT	01	STANDARD TEST SET	PROT: A	WRK LOC 06

<u>SAMPLE #</u>	<u>CLIENT SAMPLE ID</u>	<u>DATE/TIME SAMPLED</u>	<u>WORKORDER</u>	<u>I</u>			
2	0W-946	2006-11-28 / 1715	JKGWD	WATER			
<u>SAMPLE COMMENTS:</u>							
XX AK	MCAW 160.1 W	Solids, Filterable "TDS" (160.1)	88 NO SAMPLE PREPARATION PERFORMED / DIRECT	01 STANDARD TEST SET	PROT: A	WRK LOC	06
XX C8	MCAW 300.0A W	Fluoride (300.0A, Ion Chromatography)	88 NO SAMPLE PREPARATION PERFORMED / DIRECT	01 STANDARD TEST SET	PROT: A	WRK LOC	06
XX CX	MCAW 300.0A W	Chloride (300.0A, Ion Chromatography)	88 NO SAMPLE PREPARATION PERFORMED / DIRECT	01 STANDARD TEST SET	PROT: A	WRK LOC	06
XX CY	MCAW 300.0A W	Sulfate (300.0A, Ion Chromatography)	88 NO SAMPLE PREPARATION PERFORMED / DIRECT	01 STANDARD TEST SET	PROT: A	WRK LOC	06
XX GM	MCAW 300.0A W	Bromide (300.0A, Ion Chromatography)	88 NO SAMPLE PREPARATION PERFORMED / DIRECT	01 STANDARD TEST SET	PROT: A	WRK LOC	06
XX HN	MCAW 353.1 W	Nitrate-Nitrite (353.1)	23 REDUCTION	01 STANDARD TEST SET	PROT: A	WRK LOC	06
XX VC	MCAW 310.1 W	Alkalinity, Total (310.1)	88 NO SAMPLE PREPARATION PERFORMED / DIRECT	01 STANDARD TEST SET	PROT: A	WRK LOC	06
XX VM	MCAW 350.1 W	Nitrogen, Ammonia (350.1, Automated)	88 NO SAMPLE PREPARATION PERFORMED / DIRECT	01 STANDARD TEST SET	PROT: A	WRK LOC	06

F6K290160

CLIENT COMMENTS SUMMARY

Project Manager: TJR

Quote #: 71966

SDG:

Project:

NORTH ANNA

PO#: 66813

Report to: Mike Depalma

Client: 373886 MACTEC Engineering and Consulting Inc

#SMPS in LOT: 2

Storage Loc:

2-100

Date Received:

2006-11-29

Analytical Due Date:

2006-12-11

Report Due Date:

2006-12-13

Report Type: B

Standard Report

EDD Code: 00



DOCUMENTATION OF TECHNICAL REVIEW
SUBCONTRACTOR WORK PRODUCT

Project Name: Dominion North Anna COL

Project Number: 6468-06-1472

Project Manager: Steve Criscenzo

Project Principal: Al Tice

The report described below has been prepared by the named subcontractor retained in accordance with the MACTEC QAPD. The work and report have been reviewed by a MACTEC technically qualified person. Comments on the work or report, if any, have been satisfactorily addressed by the subcontractor. The attached report is approved in accordance with section QS-7 of MACTEC's QAPD

The information and data contained in the attached report are hereby released by MACTEC for project use.

REPORT: Analytical Report, North Anna COL, Lot # F6K170278
dated December 18, 2006

SUBCONTRACTOR: STL - St. Louis

DATE OF ACCEPTANCE: 12-19-06

TECHNICAL REVIEWER: William A. Kim

PROJECT PRINCIPAL Al Tice

NOTE - Samples from OW 901 and OW 950

DCN NA COL-179



3301 Atlantic Avenue, Raleigh, NC 27604

1064

Client Dominion PowerLaboratory STL - St. LouisMACTEC Project 6468-06-1472Data Report Number/Date Lot # F6K170478/12-18**LABORATORY DATA REVIEW CHECKLIST**

- | | <u>YES</u> | <u>NO</u> | <u>NOT APPLICABLE</u> |
|---|-------------------------------------|---------------------------------------|-------------------------------------|
| 1. Laboratory analytical data report appears complete (all data results present for all samples submitted for analysis) and there are no apparent transcription errors: | ☒ | ☐ | ☐ |
| 2. Samples analyzed within applicable holding times (based on date of sample collection):* | ☐ | ☒ ① | ☐ |
| 3. Trip blanks, field blanks or laboratory <u>method blanks</u> are free of blank contamination: | ☒ | ☐ | ☐ |
| 4. If field duplicate samples collected, calculated results meet Relative Percent Difference guidelines: ** | ☐ | ☐ | ☒ |
| 5. Surrogate recoveries (organic analyses only) within laboratory reported recovery acceptance ranges: | ☐ | ☐ | ☒ |
| 6. If Matrix Spike/Matrix Spike Duplicate (MS/MSD) samples required to meet project objectives, Percent Recoveries (%R) and Relative Percent Difference (RPD) within laboratory reported acceptance ranges: | ☐ | ☒ ② | ☐ |
| 7. Reported detection limits meet project objectives (e.g., are capable of achieving applicable site standards): | ☒ | ☐ | ☐ |
| 8. Completed Chain-Of-Custody received noting sample/custody seal condition (with airbill, if appropriate): | ☒ | ☐ | ☐ |
| 9. Analytical costs within authorized budget for these services: | ☐ | ☐ | ☒ |

COMMENTS: ① Nitrate and nitrite were tested outside of the 48-hour hold time for both samples (LOW-901 and LOW-950).

② LCS results within limits; Matrix Spike for Nitrate, Bromide, Fluoride, Nitrate, Nitrate/Nitrite, and Nitrite outside QL limits. Lab duplicate results for TDS and Nitrate/Nitrite, Nitrate, and Nitrite outside QL limits.

Notes: 1. This checklist is intended for use with the laboratory reporting formats typical of most projects. If "no" is answered to one or more of the above checklist questions 1 through 7, a more detailed Data Validation may be required, and a person knowledgeable in Data Validation protocols should be consulted. This checklist should not be used if the project scope requires Data Validation from the onset.

2. * = Based upon EPA Guidance and the applicable analytical method references. See reverse side of checklist for details.

3. ** = Based upon EPA Guidance. Use these criteria on duplicate and sample results which exceed five times the reported detection limit. See reverse side of checklist for details.

Checked by: Wyllie D. Stein Date: 12-18-06

GENERAL DATA REVIEW CRITERIA

Typical Holding Times for Water Samples:*

Volatile Organic Compounds (EPA Method 8260/624)

Semi-volatile Organic Compounds (EPA Method 8270)

Pesticides/PCBs (EPA Method 8081/8082)

Metals (except Mercury)

Mercury

Cyanide

14 days to analysis when preserved with HCl
(7 days if not preserved)

7 days to extraction, 40 days to analysis

7 days to extraction, 40 days to analysis

180 days to analysis when preserved with HNO₃

28 days to analysis

14 days to analysis

Typical Relative Percent Difference (RPD) Guidelines:**

Volatile Organic Compounds (EPA Method 8260/624)

Semi-volatile Organic Compounds (EPA Method 8270)

Pesticides/PCBs (EPA Method 8081/8082)

Metals and Cyanide

<u>Aqueous</u>	<u>Soil</u>
<30	<50
<30	<50
<30	<50
<30	<50

Notes:

RPD calculated as:

$$RPD = [|A-B|] / [(A+B)/2] \times 100$$

where:

RPD = Relative Percent Difference

A = Sample Result

B = Duplicate Sample Result

* = Based upon EPA Guidance and the applicable analytical method references.

** = Based upon EPA Guidance. Use these criteria on duplicate and sample results that exceed five times the reported detection limit.



TELECON RECORD

Date: 12-19-06 Time: 1335

Crimes of MACTEC Placed (☒) call.

Received () call.

Talked To: Terry Romano Of: STL - St. Louis

Concerning: North Anna

Phone No.: _____

Message:

STL 12-19-06
(1) Ornithix Spike Sample failed QC for several analytes. Was were
the samples passed/validated based on LLS returns? Yes

(2) Case narrative - Nitrate/Nitrite listed as non-homogeneous
Sample - how? OK, can have flasks or residues

(3) Nitrogen as Ammonia - ms sample failed QC, LLS used
to validate? Yes

(4) According to Reference listed for test methods -

Nitrate / 48 Hr hold - tests conducted outside of
Nitrite / hold time if not qualified.

→ out of hold, but not
work, not requested per LCL

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Tel: 314 298 8566 Fax: 314 298 8757
www.stl-inc.com

ANALYTICAL REPORT

NORTH ANNA COL

Lot #: F6K170278

J. Allan Tyce

MACTEC Engineering & Consultin
3301 Atlantic Ave
Raleigh, NC 27604

SEVERN TRENT LABORATORIES, INC.


Terry Romanko
Project Manager

December 18, 2006

DCN NA COL 178

Case Narrative
LOT NUMBER: F6K170278

This report contains the analytical results for the two samples received under chain of custody by STL St. Louis on November 17, 2006. These samples are associated with your NORTH ANNA COL project.

The analytical results included in this report meet all applicable quality control procedure requirements except as noted on the following page.

The test results in this report meet all NELAP requirements for parameters in which accreditations are held by STL St. Louis. Any exceptions to NELAP requirements are noted in the case narrative. The case narrative is an integral part of this report.

All chemical analysis results are based upon sample as received, wet weight, unless noted otherwise. All radiochemistry results are based upon sample as dried and ground with the exception of tritium, unless requested wet weight by the client.

Observations/Nonconformances

Reference the chain of custody and condition upon receipt report for any variations on receipt conditions and temperature of samples on receipt.

Anions (Bromide, Chloride, Fluoride, Nitrate, Nitrite, Sulfate) (MCAWW 300.0A)

The anion matrix spike solution contains all routine anions. Spiking technique, sample preparation and method compliance is demonstrated by the remaining acceptable MS recoveries. Poor matrix spike recovery Bromide in batch 6341065, Fluoride in batch 6341067, Nitrate in batch 6341068, and Nitrite in batch 6341069 is attributed to matrix interference.

The sample duplicate %RPD for Nitrate in batch 6341068 and Nitrite in batch 6341069 is outside the established QC limits. A matrix interference is physically evident in the sample. Method performance is demonstrated by acceptable LCS recovery.

Affected Samples:

F6K170278 (1): OW-950

F6K170278 (2): OW-901

Nitrate/Nitrite as N (MCAWW 353.1)

The MS recovery for Nitrate is outside the established QC limits. A matrix interference is physically evident in the sample. Method performance is demonstrated by acceptable LCS/LCSD recoveries. The RPD is not within method acceptance criteria. The sample is non-homogeneous. Method performance is demonstrated by acceptable LCS/LCSD recovery and RPD.

Affected Samples:

F6K170278 (1): OW-950

F6K170278 (2): OW-901

Nitrogen, as Ammonia (MCAWW 350.1)

When performing a sample dilution due to high concentrations of target analytes, the matrix spike was diluted below reliable detection, making QC recoveries unreliable.

Affected Samples:

F6K170278 (1): OW-950

F6K170278 (2): OW-901

There were no nonconformances or observations noted with any other analysis on this lot.

METHODS SUMMARY

F6K170278

PARAMETER	ANALYTICAL METHOD	PREPARATION METHOD
Alkalinity	MCAWW 310.1	MCAWW 310.1
Bromide	MCAWW 300.0A	MCAWW 300.0A
Chloride	MCAWW 300.0A	MCAWW 300.0A
Filterable Residue (TDS)	MCAWW 160.1	MCAWW 160.1
Fluoride	MCAWW 300.0A	MCAWW 300.0A
Nitrate as N	MCAWW 300.0A	MCAWW 300.0A
Nitrate-Nitrite	MCAWW 353.1	
Nitrite as N	MCAWW 300.0A	MCAWW 300.0A
Nitrogen, Ammonia	MCAWW 350.1	MCAWW 350.1
Sulfate	MCAWW 300.0A	MCAWW 300.0A

References:

MCAWW "Methods for Chemical Analysis of Water and Wastes",
EPA-600/4-79-020, March 1983 and subsequent revisions.

SAMPLE SUMMARY

F6K170278

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
JJ02X	001	OW-950	11/16/06	12:10
JJ029	002	OW-901	11/16/06	14:55

NOTE(S) :

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

MACTEC Engineering and Consulting Inc

Client Sample ID: OW-950

General Chemistry

Lot-Sample #....: F6K170278-001 Work Order #....: JJ02X Matrix.....: WATER
Date Sampled....: 11/16/06 12:10 Date Received...: 11/17/06

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Bromide	ND	0.25	mg/L	MCAWW 300.0A	12/01/06	6341065
		Dilution Factor: 1		Analysis Time...: 08:27		
Chloride	25.3	2.0	mg/L	MCAWW 300.0A	12/01/06	6341066
		Dilution Factor: 10		Analysis Time...: 09:19		
Fluoride	0.14	0.10	mg/L	MCAWW 300.0A	12/01/06	6341067
		Dilution Factor: 1		Analysis Time...: 08:27		
Nitrate	0.32	0.020	mg/L	MCAWW 300.0A	12/01/06	6341068
		Dilution Factor: 1		Analysis Time...: 08:27		
Nitrate/Nitrite as N	0.65	0.050	mg/L	MCAWW 353.1	12/04/06	6339052
		Dilution Factor: 1		Analysis Time...: 00:00		
Nitrite	0.13	0.020	mg/L	MCAWW 300.0A	12/01/06	6341069
		Dilution Factor: 1		Analysis Time...: 08:27		
Nitrogen, as Ammonia	0.14	0.050	mg/L	MCAWW 350.1	12/08/06	6349319
		Dilution Factor: 1		Analysis Time...: 00:00		
Sulfate	17.2	5.0	mg/L	MCAWW 300.0A	12/01/06	6341070
		Dilution Factor: 10		Analysis Time...: 09:19		
Total Alkalinity	71.0	5.0	mg/L	MCAWW 310.1	11/30-12/02/06	6334286
		Dilution Factor: 1		Analysis Time...: 00:00		
Total Dissolved Solids	162	5.0	mg/L	MCAWW 160.1	11/20/06	6334178
		Dilution Factor: 1		Analysis Time...: 00:00		

MACTEC Engineering and Consulting Inc

Client Sample ID: OW-901

General Chemistry

Lot-Sample #...: F6K170278-002 Work Order #...: JJ029 Matrix.....: WATER
 Date Sampled...: 11/16/06 14:55 Date Received...: 11/17/06

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Bromide	ND	0.25	mg/L	MCAWW 300.0A Dilution Factor: 1 Analysis Time...: 10:47	12/01/06	6341065
Chloride	8.8	2.0	mg/L	MCAWW 300.0A Dilution Factor: 10 Analysis Time...: 11:04	12/01/06	6341066
Fluoride	0.12	0.10	mg/L	MCAWW 300.0A Dilution Factor: 1 Analysis Time...: 10:47	12/01/06	6341067
Nitrate	0.13	0.020	mg/L	MCAWW 300.0A Dilution Factor: 1 Analysis Time...: 10:47	12/01/06	6341068
Nitrate/Nitrite as N	0.19	0.050	mg/L	MCAWW 353.1 Dilution Factor: 1 Analysis Time...: 00:00	12/04/06	6339052
Nitrite	0.30	0.020	mg/L	MCAWW 300.0A Dilution Factor: 1 Analysis Time...: 10:47	12/01/06	6341069
Nitrogen, as Ammonia	0.14	0.050	mg/L	MCAWW 350.1 Dilution Factor: 1 Analysis Time...: 00:00	12/08/06	6349319
Sulfate	2.1	0.50	mg/L	MCAWW 300.0A Dilution Factor: 1 Analysis Time...: 10:47	12/01/06	6341070
Total Alkalinity	74.0	5.0	mg/L	MCAWW 310.1 Dilution Factor: 1 Analysis Time...: 00:00	11/30-12/02/06	6334286
Total Dissolved Solids	133	5.0	mg/L	MCAWW 160.1 Dilution Factor: 1 Analysis Time...: 00:00	11/20/06	6334178

METHOD BLANK REPORT

General Chemistry

Client Lot #....: F6K170278

Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Bromide	ND	Work Order #: JK0JX1AA 0.25 Dilution Factor: 1 Analysis Time...: 06:25	mg/L	MB Lot-Sample #: F6L070000-065 MCAWW 300.0A	12/01/06	6341065
Chloride	ND	Work Order #: JK0J01AA 0.20 Dilution Factor: 1 Analysis Time...: 06:25	mg/L	MB Lot-Sample #: F6L070000-066 MCAWW 300.0A	12/01/06	6341066
Fluoride	ND	Work Order #: JK0J11AA 0.10 Dilution Factor: 1 Analysis Time...: 06:25	mg/L	MB Lot-Sample #: F6L070000-067 MCAWW 300.0A	12/01/06	6341067
Nitrate	ND	Work Order #: JK0J21AA 0.020 Dilution Factor: 1 Analysis Time...: 06:25	mg/L	MB Lot-Sample #: F6L070000-068 MCAWW 300.0A	12/01/06	6341068
Nitrate/Nitrite as N	ND	Work Order #: JKREF1AA 0.050 Dilution Factor: 1 Analysis Time...: 00:00	mg/L	MB Lot-Sample #: F6L050000-052 MCAWW 353.1	12/04/06	6339052
Nitrite	ND	Work Order #: JK0J31AA 0.020 Dilution Factor: 1 Analysis Time...: 06:25	mg/L	MB Lot-Sample #: F6L070000-069 MCAWW 300.0A	12/01/06	6341069
Nitrogen, as Ammonia	ND	Work Order #: JLKM11AA 0.050 Dilution Factor: 1 Analysis Time...: 00:00	mg/L	MB Lot-Sample #: F6L150000-319 MCAWW 350.1	12/08/06	6349319
Sulfate	ND	Work Order #: JK0J51AA 0.50 Dilution Factor: 1 Analysis Time...: 06:25	mg/L	MB Lot-Sample #: F6L070000-070 MCAWW 300.0A	12/01/06	6341070
Total Alkalinity	ND	Work Order #: JKN151AA 5.0 Dilution Factor: 1 Analysis Time...: 00:00	mg/L	MB Lot-Sample #: F6K300000-286 MCAWW 310.1	11/30-12/02/06	6334286

(Continued on next page)

METHOD BLANK REPORT

General Chemistry

Client Lot #...: F6K170278

Matrix.....: WATER

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING</u> <u>LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION-</u> <u>ANALYSIS DATE</u>	<u>PREP</u> <u>BATCH #</u>
Total Dissolved Solids	ND	5.0	mg/L	MCAWW 160.1	11/20/06	6334178
Work Order #: JKH971AA MB Lot-Sample #: F6K300000-178						
Dilution Factor: 1						
Analysis Time...: 00:00						

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

General Chemistry

Lot-Sample #...: F6K170278

Matrix.....: WATER

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Bromide					WO#:JK0JX1AC-LCS/JK0JX1AD-LCSD	LCS Lot-Sample#: F6L070000-065	
	100	(90 - 110)			MCAWW 300.0A	12/01/06	6341065
	94	(90 - 110)	5.6	(0-20)	MCAWW 300.0A	12/01/06	6341065
			Dilution Factor: 1		Analysis Time...: 06:08		
Chloride					WO#:JK0J01AC-LCS/JK0J01AD-LCSD	LCS Lot-Sample#: F6L070000-066	
	99	(90 - 110)			MCAWW 300.0A	12/01/06	6341066
	101	(90 - 110)	2.2	(0-20)	MCAWW 300.0A	12/01/06	6341066
			Dilution Factor: 1		Analysis Time...: 06:08		
Fluoride					WO#:JK0J11AC-LCS/JK0J11AD-LCSD	LCS Lot-Sample#: F6L070000-067	
	99	(90 - 110)			MCAWW 300.0A	12/01/06	6341067
	100	(90 - 110)	0.67	(0-20)	MCAWW 300.0A	12/01/06	6341067
			Dilution Factor: 1		Analysis Time...: 06:08		
Nitrate					WO#:JK0J21AC-LCS/JK0J21AD-LCSD	LCS Lot-Sample#: F6L070000-068	
	102	(90 - 110)			MCAWW 300.0A	12/01/06	6341068
	98	(90 - 110)	4.6	(0-20)	MCAWW 300.0A	12/01/06	6341068
			Dilution Factor: 1		Analysis Time...: 06:08		
Nitrate/Nitrite as N					WO#:JKREF1AC-LCS/JKREF1AD-LCSD	LCS Lot-Sample#: F6L050000-052	
	100	(90 - 110)			MCAWW 353.1	12/04/06	6339052
	109	(90 - 110)	8.2	(0-20)	MCAWW 353.1	12/04/06	6339052
			Dilution Factor: 1		Analysis Time...: 00:00		
Nitrite					WO#:JK0J31AC-LCS/JK0J31AD-LCSD	LCS Lot-Sample#: F6L070000-069	
	104	(90 - 110)			MCAWW 300.0A	12/01/06	6341069
	101	(90 - 110)	3.2	(0-20)	MCAWW 300.0A	12/01/06	6341069
			Dilution Factor: 1		Analysis Time...: 06:08		
Sulfate					WO#:JK0J51AC-LCS/JK0J51AD-LCSD	LCS Lot-Sample#: F6L070000-070	
	97	(90 - 110)			MCAWW 300.0A	12/01/06	6341070
	98	(90 - 110)	0.84	(0-20)	MCAWW 300.0A	12/01/06	6341070
			Dilution Factor: 1		Analysis Time...: 06:08		
Total Alkalinity					WO#:JKN151AC-LCS/JKN151AD-LCSD	LCS Lot-Sample#: F6K300000-286	
	100	(90 - 110)			MCAWW 310.1	11/30-12/02/06	6334286
	100	(90 - 110)	0.0	(0-15)	MCAWW 310.1	11/30-12/02/06	6334286
			Dilution Factor: 1		Analysis Time...: 00:00		

(Continued on next page)

LABORATORY CONTROL SAMPLE EVALUATION REPORT

General Chemistry

Lot-Sample #....: F6K170278

Matrix.....: WATER

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD RPD	LIMITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Total Dissolved Solids			WO#	:JKH971AC-LCS/JKH971AD-LCSD	LCS Lot-Sample#	: F6K300000-178	
	92	(90 - 110)			MCAWW 160.1	11/20/06	6334178
	97	(90 - 110)	4.7	(0-15)	MCAWW 160.1	11/20/06	6334178
			Dilution Factor	: 1	Analysis Time	..: 00:00	

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

General Chemistry

Client Lot #....: F6K170278

Matrix.....: WATER

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Nitrogen, as Ammonia	103	Work Order #: JLKM11AC (90 - 110)	LCS Lot-Sample#: F6L150000-319 MCAWW 350.1	12/08/06	6349319
		Dilution Factor: 1	Analysis Time...: 00:00		

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE EVALUATION REPORT

General Chemistry

Client Lot #...: F6K170278

Matrix.....: WATER

Date Sampled...: 12/01/06 14:30 Date Received...: 12/02/06

PARAMETER	PERCENT RECOVERY	RPD	PREPARATION-	PREP
	RECOVERY LIMITS	LIMITS	ANALYSIS DATE	BATCH #
Nitrogen, as Ammonia	WO#: JKPN51HC-MS/JKPN51HD-MSD	MS Lot-Sample #: F6L020205-006		
0.0 N	(90 - 110)	MCAWW 350.1	12/08/06	6349319
2880 N	(90 - 110) 0.0 (0-20)	MCAWW 350.1	12/08/06	6349319
Dilution Factor: 1				
Analysis Time...: 00:00				

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

N Spiked analyte recovery is outside stated control limits.

MATRIX SPIKE SAMPLE EVALUATION REPORT

General Chemistry

Client Lot #...: F6K170278

Matrix.....: WATER

Date Sampled...: 11/16/06 12:10 Date Received...: 11/17/06

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Bromide	236 N	Work Order #...: JJ02X1AM (90 - 110)	MCAWW 300.0A	MS Lot-Sample #: F6K170278-001 12/01/06	6341065
		Dilution Factor: 1		Analysis Time...: 08:27	
Chloride	97	Work Order #...: JJ02X1AP (90 - 110)	MCAWW 300.0A	MS Lot-Sample #: F6K170278-001 12/01/06	6341066
		Dilution Factor: 10		Analysis Time...: 09:19	
Fluoride	134 N	Work Order #...: JJ02X1AR (90 - 110)	MCAWW 300.0A	MS Lot-Sample #: F6K170278-001 12/01/06	6341067
		Dilution Factor: 1		Analysis Time...: 08:27	
Nitrate	214 N	Work Order #...: JJ02X1AU (90 - 110)	MCAWW 300.0A	MS Lot-Sample #: F6K170278-001 12/01/06	6341068
		Dilution Factor: 1		Analysis Time...: 08:27	
Nitrate/Nitrite as N	42 N	Work Order #...: JJCRL1AJ (90 - 110)	MCAWW 353.1	MS Lot-Sample #: F6K090297-001 12/04/06	6339052
		Dilution Factor: 1		Analysis Time...: 00:00	
Nitrite	437 N	Work Order #...: JJ02X1AW (90 - 110)	MCAWW 300.0A	MS Lot-Sample #: F6K170278-001 12/01/06	6341069
		Dilution Factor: 1		Analysis Time...: 08:27	
Sulfate	95	Work Order #...: JJ02X1A0 (90 - 110)	MCAWW 300.0A	MS Lot-Sample #: F6K170278-001 12/01/06	6341070
		Dilution Factor: 10		Analysis Time...: 09:19	
Total Alkalinity	101	Work Order #...: JJ27W1AN (50 - 121)	MCAWW 310.1	MS Lot-Sample #: F6K180195-002 11/30-12/02/06	6334286
		Dilution Factor: 1		Analysis Time...: 00:00	

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

N Spiked analyte recovery is outside stated control limits.

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #...: F6K170278

Work Order #...: JJ27W-SMP
JJ27W-DUP

Matrix.....: WATER

Date Sampled...: 11/17/06 15:08 Date Received...: 11/18/06

<u>PARAM</u>	<u>RESULT</u>	<u>DUPLICATE</u> <u>RESULT</u>	<u>UNITS</u>	<u>RPD</u>	<u>RPD</u> <u>LIMIT</u>	<u>METHOD</u>	<u>PREPARATION-</u> <u>ANALYSIS DATE</u>	<u>PREP</u> <u>BATCH #</u>
Total Dissolved Solids						SD Lot-Sample #:	F6K180195-002	
	72.0	80.0	mg/L	11	(0-0.0)	MCAWW 160.1	11/20/06	6334178
			Dilution Factor: 1			Analysis Time... 00:00		
Total Alkalinity						SD Lot-Sample #:	F6K180195-002	
	25.0	24.0	mg/L	4.1	(0-20)	MCAWW 310.1	11/30-12/02/06	6334286
			Dilution Factor: 1			Analysis Time... 00:00		

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #...: F6K170278

Work Order #...: JJCRL-SMP
JJCRL-DUP

Matrix.....: WATER

Date Sampled...: 11/07/06 08:32 Date Received...: 11/09/06

PARAM	RESULT	DUPLICATE RESULT	UNITS	RPD	RPD LIMIT	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Nitrate/Nitrite as N	0.094	ND	mg/L	200	(0-20)	MCAWW 353.1	12/04/06	6339052
			Dilution Factor: 1		Analysis Time...: 00:00			

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #...: F6K170278

Work Order #...: JJ02X-SMP

Matrix.....: WATER

JJ02X-DUP

Date Sampled...: 11/16/06 12:10

Date Received...: 11/17/06

PARAM RESULT	DUPLICATE RESULT	UNITS	RPD	RPD LIMIT	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Bromide					SD Lot-Sample #: F6K170278-001		
ND	ND	mg/L	0	(0-20)	MCAWW 300.0A	12/01/06	6341065
		Dilution Factor: 1		Analysis Time...: 08:27			
Chloride					SD Lot-Sample #: F6K170278-001		
25.3	24.7	mg/L	2.4	(0-20)	MCAWW 300.0A	12/01/06	6341066
		Dilution Factor: 10		Analysis Time...: 09:19			
Fluoride					SD Lot-Sample #: F6K170278-001		
0.14	0.13	mg/L	5.0	(0-20)	MCAWW 300.0A	12/01/06	6341067
		Dilution Factor: 1		Analysis Time...: 08:27			
Nitrate					SD Lot-Sample #: F6K170278-001		
0.32	0.66	mg/L	69	(0-20)	MCAWW 300.0A	12/01/06	6341068
		Dilution Factor: 1		Analysis Time...: 08:27			
Nitrite					SD Lot-Sample #: F6K170278-001		
0.13	0.45	mg/L	113	(0-20)	MCAWW 300.0A	12/01/06	6341069
		Dilution Factor: 1		Analysis Time...: 08:27			
Sulfate					SD Lot-Sample #: F6K170278-001		
17.2	16.9	mg/L	2.0	(0-20)	MCAWW 300.0A	12/01/06	6341070
		Dilution Factor: 10		Analysis Time...: 09:19			

- 5018 -

Client: Alactel COC/RFA No: _____ Condition Upon Receipt Form
Quote No: 71966 Initiated By: DD Date: 11/17/06
Time: 0706

Shipping Information

Shipper Name: EE Multiple Packages Y N N/A
Shipping # (s):*
1. 9582 9218 4021 6. _____ Sample Temperature (s):**
2. _____ 7. _____ 1. 2 6. _____
3. _____ 8. _____ 2. _____ 7. _____
4. _____ 9. _____ 3. _____ 8. _____
5. _____ 10. _____ 4. _____ 9. _____
5. _____ 10. _____

*Numbered shipping lines correspond to Numbered Sample Temp lines

**Sample must be received at 4°C ± 2°C - If not, note contents below. Temperature variance does NOT affect the following: Metals-Liquid or Rad tests-Liquid or Solids

Condition: (Circle "Y" for yes, "N" for no and "N/A" for not applicable):

1.	<u>Y</u> <u>N</u>	Was sample received broken?	8.	<u>Y</u> <u>N</u>	Sample received with Chain of Custody?
2.	<u>Y</u> <u>N</u> <u>N/A</u>	Was sample received with proper pH ¹ ? (If not, make note below)	9.	<u>Y</u> <u>N</u>	Chain of Custody matches sample ID's on container(s)?
3.	<u>Y</u> <u>N</u>	If N/A-Was pH taken by original STL Lab?	10.	<u>Y</u> <u>N</u>	Are there custody seals present on cooler?
4.	<u>Y</u> <u>N</u>	Sample received in proper containers?	11.	<u>Y</u> <u>N</u> <u>N/A</u>	Do custody seals on cooler appear to be tampered with?
5.	<u>Y</u> <u>N</u>	Sample volume sufficient for analysis?	12.	<u>Y</u> <u>N</u>	Are there custody seals present on bottles?
6.	<u>Y</u> <u>N</u> <u>N/A</u>	Headspace in VOA or TOX liquid samples? (If Yes, note sample ID's below)	13.	<u>Y</u> <u>N</u> <u>N/A</u>	Do custody seals on bottles appear to be tampered with?
7.	<u>Y</u> <u>N</u>	Were contents of the cooler frisked after opening?	14.	<u>Y</u> <u>N</u>	Was Internal COC/Workshare received?

¹ For DOE-AL (Pantex, LANL, Sandia) sites, pH of ALL containers received must be verified, EXCEPT VOA, TOX and soils.

Notes:

Corrective Action:

- ☐ Client Contact Name: _____
☐ Sample(s) processed "as is"
☐ Sample(s) on hold until: _____

Informed by: _____

If released, notify: _____

Project Management Review: St. LouisDate: 11/21/06

THIS FORM MUST BE COMPLETED AT THE TIME THE ITEMS ARE BEING CHECKED IN. IF ANY ITEM IS COMPLETED BY SOMEONE OTHER THAN THE INITIATOR, THEN THAT PERSON IS REQUIRED TO APPLY THEIR INITIAL AND THE DATE NEXT TO THAT ITEM.

ADMIN-0004, REVISED 03/01/06\SI\wr\Q1\QA\FORMS\ST-LOUIS\ADMIN\Admin004030106.doc



**DOCUMENTATION OF TECHNICAL REVIEW
SUBCONTRACTOR WORK PRODUCT**

Project Name: North Anna COL

Project Number: 6468-06-1472

Project Manager: Steve Criscenzo

Project Principal: Al Tice

The report described below has been prepared by the named subcontractor retained in accordance with the MACTEC QAPD. The work and report have been reviewed by a MACTEC technically qualified person. Comments on the work or report, if any, have been satisfactorily addressed by the subcontractor. The attached report is approved in accordance with section QS-7 of MACTEC's QAPD

The information and data contained in the attached report are hereby released by MACTEC for project use.

REPORT : Analytical Report Project No. 6468-06-1472, North Anna, Lot #: F6K180195

December 22, 2006

SUBCONTRACTOR: Severn Trent Laboratories, Inc. (STL St. Louis)

DATE OF ACCEPTANCE : January 19, 2007

TECHNICAL REVIEWER: William J. Thini

PROJECT PRINCIPAL : J. Allan Tice

*Note - Samples from OW945, OW947 and OW951
JAT 1-19-07*

DCN NA COL- 193



3301 Atlantic Avenue, Raleigh, NC 27604

Client Dominion PowerLaboratory STL - St. LouisMACTEC Project 6468-06-1472Data Report Number/Date LOT # F6K180195 / 12-22-2006Amended Review Based on Final Report**LABORATORY DATA REVIEW CHECKLIST**

	<u>YES</u>	<u>NO</u>	<u>NOT APPLICABLE</u>
1. Laboratory analytical data report appears complete (all data results present for all samples submitted for analysis) and there are no apparent transcription errors:	☒	☐	☐
2. Samples analyzed within applicable holding times (based on date of sample collection):*	☐	☒ ①	☐
3. Trip blanks, field blanks or laboratory method blanks are free of blank contamination:	☒	☐	☐
4. If field duplicate samples collected, calculated results meet Relative Percent Difference guidelines: **	☐	☐	☒
5. Surrogate recoveries (organic analyses only) within laboratory reported recovery acceptance ranges:	☐	☐	☒
6. If Matrix Spike/Matrix Spike Duplicate (MS/MSD) samples required to meet project objectives, Percent Recoveries (%R) and Relative Percent Difference (RPD) within laboratory reported acceptance ranges:	☐	☒ ②	☐
7. Reported detection limits meet project objectives (e.g., are capable of achieving applicable site standards):	☒	☐	☐
8. Completed Chain-Of-Custody received noting sample/custody seal condition (with airbill, if appropriate):	☒	☐	☐
9. Analytical costs within authorized budget for these services:	☒	☐	☐

COMMENTS: ① Tests originally run within Hold Time, but equipment malfunction resulted in invalid results. Tests run out of hold.

Nonconformance and Corrective Action Report (NCR-NCA-18) determined results usable as is. NCR-NCA-18 also approved the use of 1 sample for reanalysis outside of Hold Time due to use of an expired reagent. ② MS + MSD samples for several analytes failed QC criteria. Sample results validated based on laboratory control sum passing QC criteria.

- Notes: 1. This checklist is intended for use with the laboratory reporting formats typical of most projects. If "no" is answered to one or more of the above checklist questions 1 through 7, a more detailed Data Validation may be required, and a person knowledgeable in Data Validation protocols should be consulted. This checklist should not be used if the project scope requires Data Validation from the onset.
2. * = Based upon EPA Guidance and the applicable analytical method references. See reverse side of checklist for details.
3. ** = Based upon EPA Guidance. Use these criteria on duplicate and sample results which exceed five times the reported detection limit. See reverse side of checklist for details.

Checked by: William H. Kim Date: 1-19-07

Client Dominion PowerLaboratory STL - St. LouisMACTEC Project 6468-06-1472Data Report Number/Date Lot # F6K180195 / 12-18-2Partial - Draft Rpt.**LABORATORY DATA REVIEW CHECKLIST**

- | | <u>YES</u> | <u>NO</u> | <u>NOT APPLICABLE</u> |
|---|-------------------|------------------|------------------------------|
| Laboratory analytical data report appears complete (all data results present for all samples submitted for analysis) and there are no apparent transcription errors: | — | ✓ ^① | — |
| 2. Samples analyzed within applicable holding times (based on date of sample collection):* | ✓ | — | — |
| 3. Trip blanks, field blanks or laboratory method blanks are free of blank contamination: | ✓ | — | — |
| 4. If field duplicate samples collected, calculated results meet Relative Percent Difference guidelines: ** | — | — | ✓ |
| 5. Surrogate recoveries (organic analyses only) within laboratory reported recovery acceptance ranges: | — | — | ✓ |
| 6. If Matrix Spike/Matrix Spike Duplicate (MS/MSD) samples required to meet project objectives, Percent Recoveries (%R) and Relative Percent Difference (RPD) within laboratory reported acceptance ranges: | — | ✓ ^② | — |
| 7. Reported detection limits meet project objectives (e.g., are capable of achieving applicable site standards): | ✓ | — | — |
| 8. Completed Chain-Of-Custody received noting sample/custody seal condition (with airbill, if appropriate): | — | ✓ ^③ | — |
| 9. Analytical costs within authorized budget for these services: | — | — | ✓ |

Answers Based on Data provided, subject to change w/ final Lab Reports

COMMENTS: ① missing results - all, draft report. ② matrix spike sample for nitrogen as ammonia, nitrate/nitrite and lab duplicates
For TDS and nitrate/nitrite outside RL limits ③ draft report, missing COL - should be in final

Notes: 1. This checklist is intended for use with the laboratory reporting formats typical of most projects. If "no" is answered to one or more of the above checklist questions 1 through 7, a more detailed Data Validation may be required, and a person knowledgeable in Data Validation protocols should be consulted. This checklist should not be used if the project scope requires Data Validation from the onset.

2. * = Based upon EPA Guidance and the applicable analytical method references. See reverse side of checklist for details.

3. ** = Based upon EPA Guidance. Use these criteria on duplicate and sample results which exceed five times the reported detection limit. See reverse side of checklist for details.

Checked by: William A. PinDate: 12-18-20

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Tel: 314 298 8566 Fax: 314 298 8757
www.stl-inc.com

ANALYTICAL REPORT

*This page NA
GJ 12/22/06*

North Anna COL

Lot #: F6K180195

Mike Sufnarski

MACTEC Engineering & Consultin
2801 Yorkmont Rd
Suite 100
Charlotte, NC 28208

SEVERN TRENT LABORATORIES, INC.

Angelo P. Bufalino
for
Terry Romanko
Project Manager

December 22, 2006

DCN NA 191



STL[®]

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045

Tel: 314 298 8566 Fax: 314 298 8757
www.stl-inc.com

ANALYTICAL REPORT

North Anna CDL

Lot #: F6K180195

J. Allan Tyce

MACTEC Engineering & Consultin
3301 Atlantic Ave
Raleigh, NC 27604

SEVERN TRENT LABORATORIES, INC.

A handwritten signature in black ink, appearing to read "Terry Romanko".

Terry Romanko

Project Manager

December 22, 2006

Case Narrative
LOT NUMBER: F6K180195

This report contains the analytical results for the three samples received under chain of custody by STL St. Louis on November 18, 2006. These samples are associated with your North Anna COL project.

The analytical results included in this report meet all applicable quality control procedure requirements except as noted on the following page.

The test results in this report meet all NELAP requirements for parameters in which accreditations are held by STL St. Louis. Any exceptions to NELAP requirements are noted in the case narrative. The case narrative is an integral part of this report.

All chemical analysis results are based upon sample as received, wet weight, unless noted otherwise. All radiochemistry results are based upon sample as dried and ground with the exception of tritium, unless requested wet weight by the client.

Observations/Nonconformances

Reference the chain of custody and condition upon receipt report for any variations on receipt conditions and temperature of samples on receipt.

Anions by MCAWW 300.0A

Poor matrix spike recovery for Chloride, Nitrate, Nitrite, Bromide, and Sulfate is attributed to matrix interference. These samples were originally analyzed within hold time, but the re-analysis, due to CCV failure, was after the hold time had expired.

Affected Samples:

F6K180195 (1): OW-945

F6K180195 (2): OW-947

F6K180195 (3): OW-951

Nitrite by MCAWW 300.0A

The sample was analyzed at a dilution due to high concentrations of target analytes.

Affected Samples:

F6K180195 (1): OW-945

F6K180195 (2): OW-947

F6K180195 (3): OW-951

Nitrogen, Ammonia by MCAWW 350.1

When performing a sample dilution due to high concentrations of target analytes, the matrix spike was diluted below reliable detection, making QC recoveries uninformative. Due to analyst error the sodium hypochlorite reagent was used past its expiration date.

Affected Samples:

F6K180195 (1): OW-945

F6K180195 (2): OW-947

Nitrate-Nitrite by MCAWW 353.1

The MS recovery and RPD are outside the established QC limits. Matrix interference is physically evident in the sample. Method performance is demonstrated by acceptable LCS/LCSD recoveries.

Affected Samples:

F6K180195 (1): OW-945

F6K180195 (2): OW-947

F6K180195 (3): OW-951

There are no anomalies to report for the following analyses:

Alkalinity by MCAWW 310.1

TDS by MCAWW 160.1

METHODS SUMMARY**F6K180195**

<u>PARAMETER</u>	<u>ANALYTICAL METHOD</u>	<u>PREPARATION METHOD</u>
Alkalinity	MCAWW 310.1	MCAWW 310.1
Bromide	MCAWW 300.0A	MCAWW 300.0A
Chloride	MCAWW 300.0A	MCAWW 300.0A
Filterable Residue (TDS)	MCAWW 160.1	MCAWW 160.1
Fluoride	MCAWW 300.0A	MCAWW 300.0A
Nitrate as N	MCAWW 300.0A	MCAWW 300.0A
Nitrate-Nitrite	MCAWW 353.1	
Nitrite as N	MCAWW 300.0A	MCAWW 300.0A
Nitrogen, Ammonia	MCAWW 350.1	MCAWW 350.1
Sulfate	MCAWW 300.0A	MCAWW 300.0A

References:

MCAWW "Methods for Chemical Analysis of Water and Wastes",
EPA-600/4-79-020, March 1983 and subsequent revisions.

SAMPLE SUMMARY**F6K180195**

<u>WO #</u>	<u>SAMPLE#</u>	<u>CLIENT</u>	<u>SAMPLE ID</u>	<u>SAMPLED</u> <u>DATE</u>	<u>SAMP</u> <u>TIME</u>
JJ27V	001	OW-945		11/17/06	12:20
JJ27W	002	OW-947		11/17/06	15:08
JJ27X	003	OW-951		11/17/06	15:48

NOTE(S) :

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

MACTEC Engineering and Consulting Inc

Client Sample ID: OW-945

General Chemistry

Lot-Sample #...: F6K180195-001 Work Order #...: JJ27V Matrix.....: WATER
 Date Sampled...: 11/17/06 12:20 Date Received...: 11/18/06

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Bromide	ND	0.25	mg/L	MCAWW 300.0A	12/18/06	6328268
		Dilution Factor: 1		Analysis Time...: 11:33		
Chloride	0.93	0.20	mg/L	MCAWW 300.0A	12/18/06	6328269
		Dilution Factor: 1		Analysis Time...: 11:33		
Fluoride	ND	0.10	mg/L	MCAWW 300.0A	12/18/06	6328270
		Dilution Factor: 1		Analysis Time...: 11:33		
Nitrate	ND	0.020	mg/L	MCAWW 300.0A	12/18/06	6328271
		Dilution Factor: 1		Analysis Time...: 11:33		
Nitrate/Nitrite as N	ND	0.050	mg/L	MCAWW 353.1	12/04/06	6339052
		Dilution Factor: 1		Analysis Time...: 00:00		
Nitrite	ND	0.020	mg/L	MCAWW 300.0A	12/18/06	6328272
		Dilution Factor: 1		Analysis Time...: 11:33		
Nitrogen, as Ammonia	ND	0.050	mg/L	MCAWW 350.1	12/08/06	6349319
		Dilution Factor: 1		Analysis Time...: 00:00		
Sulfate	0.52	0.50	mg/L	MCAWW 300.0A	12/18/06	6328273
		Dilution Factor: 1		Analysis Time...: 11:33		
Total Alkalinity	ND	5.0	mg/L	MCAWW 310.1	11/30-12/02/06	6334286
		Dilution Factor: 1		Analysis Time...: 00:00		
Total Dissolved Solids	11.0	5.0	mg/L	MCAWW 160.1	11/20/06	6334178
		Dilution Factor: 1		Analysis Time...: 00:00		

MACTEC Engineering and Consulting Inc

Client Sample ID: OW-947

General Chemistry

Lot-Sample #...: F6K180195-002 Work Order #...: JJ27W Matrix.....: WATER
 Date Sampled...: 11/17/06 15:08 Date Received...: 11/18/06

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Bromide	ND	0.25	mg/L	MCAWW 300.0A Dilution Factor: 1 Analysis Time...: 01:06	12/18-12/19/06	6328268
Chloride	1.9	0.20	mg/L	MCAWW 300.0A Dilution Factor: 1 Analysis Time...: 01:06	12/18-12/19/06	6328269
Fluoride	0.049 B	0.10	mg/L	MCAWW 300.0A Dilution Factor: 1 Analysis Time...: 01:06	12/18-12/19/06	6328270
Nitrate	0.92	0.020	mg/L	MCAWW 300.0A Dilution Factor: 1 Analysis Time...: 01:06	12/18-12/19/06	6328271
Nitrate/Nitrite as N	0.97	0.050	mg/L	MCAWW 353.1 Dilution Factor: 1 Analysis Time...: 00:00	12/04/06	6339052
Nitrite	ND	0.020	mg/L	MCAWW 300.0A Dilution Factor: 1 Analysis Time...: 01:06	12/18-12/19/06	6328272
Nitrogen, as Ammonia	ND	0.050	mg/L	MCAWW 350.1 Dilution Factor: 1 Analysis Time...: 00:00	12/08/06	6349319
Sulfate	2.1	0.50	mg/L	MCAWW 300.0A Dilution Factor: 1 Analysis Time...: 01:06	12/18-12/19/06	6328273
Total Alkalinity	25.0	5.0	mg/L	MCAWW 310.1 Dilution Factor: 1 Analysis Time...: 00:00	11/30-12/02/06	6334286
Total Dissolved Solids	72.0	5.0	mg/L	MCAWW 160.1 Dilution Factor: 1 Analysis Time...: 00:00	11/20/06	6334178

NOTE(S):

RL Reporting Limit

B Estimated result. Result is less than RL.

MACTEC Engineering and Consulting Inc

Client Sample ID: OW-951

General Chemistry

Lot-Sample #...: F6K180195-003 Work Order #...: JJ27X Matrix.....: WATER
 Date Sampled...: 11/17/06 15:48 Date Received...: 11/18/06

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Bromide	ND	2.5	mg/L	MCAWW 300.0A Dilution Factor: 10 Analysis Time...: 01:44	12/18-12/19/06	6328268
Chloride	9.3	2.0	mg/L	MCAWW 300.0A Dilution Factor: 10 Analysis Time...: 01:44	12/18-12/19/06	6328269
Fluoride	0.63	0.10	mg/L	MCAWW 300.0A Dilution Factor: 1 Analysis Time...: 01:25	12/18-12/19/06	6328270
Nitrate	0.25	0.020	mg/L	MCAWW 300.0A Dilution Factor: 1 Analysis Time...: 01:25	12/18-12/19/06	6328271
Nitrate/Nitrite as N	0.39	0.050	mg/L	MCAWW 353.1 Dilution Factor: 1 Analysis Time...: 00:00	12/04/06	6339052
Nitrite	0.17 B	0.20	mg/L	MCAWW 300.0A Dilution Factor: 10 Analysis Time...: 01:44	12/18-12/19/06	6328272
Nitrogen, as Ammonia	0.078	0.050	mg/L	MCAWW 350.1 Dilution Factor: 1 Analysis Time...: 00:00	12/07/06	6341275
Sulfate	592	25.0	mg/L	MCAWW 300.0A Dilution Factor: 50 Analysis Time...: 02:02	12/18-12/19/06	6328273
Total Alkalinity	184	5.0	mg/L	MCAWW 310.1 Dilution Factor: 1 Analysis Time...: 00:00	11/30-12/02/06	6334286
Total Dissolved Solids	1090	5.0	mg/L	MCAWW 160.1 Dilution Factor: 1 Analysis Time...: 00:00	11/20/06	6334178

NOTE(S) :

RL Reporting Limit

B Estimated result. Result is less than RL.

METHOD BLANK REPORT

General Chemistry

Client Lot #...: F6K180195

Matrix.....: WATER

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Bromide	ND	Work Order #: JLTL31AA 0.25	mg/L	MB Lot-Sample #: F6K240000-268 MCAWW 300.0A	12/18/06	6328268
		Dilution Factor: 1 Analysis Time...: 08:43				
Chloride	ND	Work Order #: JLTL41AA 0.20	mg/L	MB Lot-Sample #: F6K240000-269 MCAWW 300.0A	12/18/06	6328269
		Dilution Factor: 1 Analysis Time...: 08:43				
Fluoride	ND	Work Order #: JLTL51AA 0.10	mg/L	MB Lot-Sample #: F6K240000-270 MCAWW 300.0A	12/18/06	6328270
		Dilution Factor: 1 Analysis Time...: 08:43				
Nitrate	ND	Work Order #: JLTML1AA 0.020	mg/L	MB Lot-Sample #: F6K240000-271 MCAWW 300.0A	12/18/06	6328271
		Dilution Factor: 1 Analysis Time...: 08:43				
Nitrate/Nitrite as N	ND	Work Order #: JKREF1AA 0.050	mg/L	MB Lot-Sample #: F6L050000-052 MCAWW 353.1	12/04/06	6339052
		Dilution Factor: 1 Analysis Time...: 00:00				
Nitrite	ND	Work Order #: JLTL61AA 0.020	mg/L	MB Lot-Sample #: F6K240000-272 MCAWW 300.0A	12/18/06	6328272
		Dilution Factor: 1 Analysis Time...: 08:43				
Nitrogen, as Ammonia	ND	Work Order #: JK04Q1AA 0.050	mg/L	MB Lot-Sample #: F6L070000-275 MCAWW 350.1	12/07/06	6341275
		Dilution Factor: 1 Analysis Time...: 00:00				
Nitrogen, as Ammonia	ND	Work Order #: JLKM11AA 0.050	mg/L	MB Lot-Sample #: F6L150000-319 MCAWW 350.1	12/08/06	6349319
		Dilution Factor: 1 Analysis Time...: 00:00				
Sulfate	ND	Work Order #: JLTL71AA 0.50	mg/L	MB Lot-Sample #: F6K240000-273 MCAWW 300.0A	12/18/06	6328273
		Dilution Factor: 1 Analysis Time...: 08:43				

(Continued on next page)

METHOD BLANK REPORT

General Chemistry

Client Lot #...: F6K180195

Matrix.....: WATER

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING</u> <u>LIMIT</u>	<u>UNITS</u>	<u>METHOD</u>	<u>PREPARATION-</u> <u>ANALYSIS DATE</u>	<u>PREP</u> <u>BATCH #</u>
Total Alkalinity	ND	Work Order #: JKN151AA 5.0	mg/L	MB Lot-Sample #: F6K300000-286 MCAWW 310.1	11/30-12/02/06	6334286
		Dilution Factor: 1				
		Analysis Time...: 00:00				
Total Dissolved Solids	ND	Work Order #: JKH971AA 5.0	mg/L	MB Lot-Sample #: F6K300000-178 MCAWW 160.1	11/20/06	6334178
		Dilution Factor: 1				
		Analysis Time...: 00:00				

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

General Chemistry

Lot-Sample #....: F6K180195

Matrix.....: WATER

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	RPD LIMITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Bromide					WO#:JLTL31AC-LCS/JLTL31AD-LCSD LCS Lot-Sample#: F6K240000-268		
	95	(90 - 110)			MCAWW 300.0A	12/18/06	6328268
	91	(90 - 110)	4.3	(0-20)	MCAWW 300.0A	12/18/06	6328268
					Dilution Factor: 1	Analysis Time...: 08:08	
Chloride					WO#:JLTL41AC-LCS/JLTL41AD-LCSD LCS Lot-Sample#: F6K240000-269		
	95	(90 - 110)			MCAWW 300.0A	12/18/06	6328269
	97	(90 - 110)	2.7	(0-20)	MCAWW 300.0A	12/18/06	6328269
					Dilution Factor: 1	Analysis Time...: 08:08	
Fluoride					WO#:JLTL51AC-LCS/JLTL51AD-LCSD LCS Lot-Sample#: F6K240000-270		
	96	(90 - 110)			MCAWW 300.0A	12/18/06	6328270
	94	(90 - 110)	1.6	(0-20)	MCAWW 300.0A	12/18/06	6328270
					Dilution Factor: 1	Analysis Time...: 08:08	
Nitrate					WO#:JLTML1AC-LCS/JLTML1AD-LCSD LCS Lot-Sample#: F6K240000-271		
	98	(90 - 110)			MCAWW 300.0A	12/18/06	6328271
	102	(90 - 110)	3.4	(0-20)	MCAWW 300.0A	12/18/06	6328271
					Dilution Factor: 1	Analysis Time...: 08:08	
Nitrate/Nitrite as N					WO#:JKREF1AC-LCS/JKREF1AD-LCSD LCS Lot-Sample#: F6L050000-052		
	100	(90 - 110)			MCAWW 353.1	12/04/06	6339052
	109	(90 - 110)	8.2	(0-20)	MCAWW 353.1	12/04/06	6339052
					Dilution Factor: 1	Analysis Time...: 00:00	
Nitrite					WO#:JLTL61AC-LCS/JLTL61AD-LCSD LCS Lot-Sample#: F6K240000-272		
	96	(90 - 110)			MCAWW 300.0A	12/18/06	6328272
	101	(90 - 110)	4.5	(0-20)	MCAWW 300.0A	12/18/06	6328272
					Dilution Factor: 1	Analysis Time...: 08:08	
Sulfate					WO#:JLTL71AC-LCS/JLTL71AD-LCSD LCS Lot-Sample#: F6K240000-273		
	95	(90 - 110)			MCAWW 300.0A	12/18/06	6328273
	94	(90 - 110)	0.92	(0-20)	MCAWW 300.0A	12/18/06	6328273
					Dilution Factor: 1	Analysis Time...: 08:08	
Total Alkalinity					WO#:JKN151AC-LCS/JKN151AD-LCSD LCS Lot-Sample#: F6K300000-286		
	100	(90 - 110)			MCAWW 310.1	11/30-12/02/06	6334286
	100	(90 - 110)	0.0	(0-15)	MCAWW 310.1	11/30-12/02/06	6334286
					Dilution Factor: 1	Analysis Time...: 00:00	

(Continued on next page)

LABORATORY CONTROL SAMPLE EVALUATION REPORT

General Chemistry

Lot-Sample #...: F6K180195

Matrix.....: WATER

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>RPD LIMITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>PREP BATCH #</u>
Total Dissolved						
Solids						
	92	(90 - 110)		MCAWW 160.1	11/20/06	6334178
	97	(90 - 110)	4.7 (0-15)	MCAWW 160.1	11/20/06	6334178
			Dilution Factor: 1	Analysis Time...: 00:00		

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

LABORATORY CONTROL SAMPLE EVALUATION REPORT

General Chemistry

Client Lot #...: F6K180195

Matrix.....: WATER

<u>PARAMETER</u>	<u>PERCENT RECOVERY</u>	<u>RECOVERY LIMITS</u>	<u>METHOD</u>	<u>PREPARATION- ANALYSIS DATE</u>	<u>PREP BATCH #</u>
Nitrogen, as Ammonia	98	Work Order #: JK04Q1AC LCS Lot-Sample#: F6L070000-275 (90 - 110)	MCAWW 350.1	12/07/06	6341275
		Dilution Factor: 1	Analysis Time...: 00:00		
Nitrogen, as Ammonia	103	Work Order #: JLKM11AC LCS Lot-Sample#: F6L150000-319 (90 - 110)	MCAWW 350.1	12/08/06	6349319
		Dilution Factor: 1	Analysis Time...: 00:00		

NOTE(S):

Calculations are performed before rounding to avoid round-off errors in calculated results.

MATRIX SPIKE SAMPLE EVALUATION REPORT

General Chemistry

Client Lot #...: F6K180195

Matrix.....: WATER

Date Sampled...: 12/01/06 14:30 Date Received...: 12/02/06

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD	LIMITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Nitrogen, as Ammonia			WO#:	JJ28E1E9-MS/JJ28E1FA-MSD	MS Lot-Sample #:	F6K180200-001	
	102	(90 - 110)			MCAWW 350.1	12/07/06	6341275
	100	(90 - 110)	1.5	(0-20)	MCAWW 350.1	12/07/06	6341275
			Dilution Factor:	1			
			Analysis Time..:	00:00			
Nitrogen, as Ammonia			WO#:	JKPN51HC-MS/JKPN51HD-MSD	MS Lot-Sample #:	F6L020205-006	
	0.0 N	(90 - 110)			MCAWW 350.1	12/08/06	6349319
	2880 N	(90 - 110)	0.0	(0-20)	MCAWW 350.1	12/08/06	6349319
			Dilution Factor:	1			
			Analysis Time..:	00:00			

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

N Spiked analyte recovery is outside stated control limits.

MATRIX SPIKE SAMPLE EVALUATION REPORT

General Chemistry

Client Lot #...: F6K180195

Matrix.....: WATER

Date Sampled...: 11/17/06 12:20 Date Received...: 11/18/06

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Bromide	188 N	Work Order #...: JJ27V1AM (90 - 110)	MCAWW 300.0A	MS Lot-Sample #: F6K180195-001 12/18-12/19/06	6328268
		Dilution Factor: 1		Analysis Time...: 11:33	
Chloride	115 N	Work Order #...: JJ27V1AP (90 - 110)	MCAWW 300.0A	MS Lot-Sample #: F6K180195-001 12/18-12/19/06	6328269
		Dilution Factor: 1		Analysis Time...: 11:33	
Fluoride	106	Work Order #...: JJ27V1AR (90 - 110)	MCAWW 300.0A	MS Lot-Sample #: F6K180195-001 12/18-12/19/06	6328270
		Dilution Factor: 1		Analysis Time...: 11:33	
Nitrate	114 N	Work Order #...: JJ27V1AO (90 - 110)	MCAWW 300.0A	MS Lot-Sample #: F6K180195-001 12/18-12/19/06	6328271
		Dilution Factor: 1		Analysis Time...: 11:33	
Nitrate/Nitrite as N	42 N	Work Order #...: JJCRL1AJ (90 - 110)	MCAWW 353.1	MS Lot-Sample #: F6K090297-001 12/04/06	6339052
		Dilution Factor: 1		Analysis Time...: 00:00	
Nitrite	31 N	Work Order #...: JJ27V1AU (90 - 110)	MCAWW 300.0A	MS Lot-Sample #: F6K180195-001 12/18-12/19/06	6328272
		Dilution Factor: 1		Analysis Time...: 11:33	
Sulfate	100	Work Order #...: JJ27V1AW (90 - 110)	MCAWW 300.0A	MS Lot-Sample #: F6K180195-001 12/18-12/19/06	6328273
		Dilution Factor: 1		Analysis Time...: 11:33	
Total Alkalinity	101	Work Order #...: JJ27W1AN (50 - 121)	MCAWW 310.1	MS Lot-Sample #: F6K180195-002 11/30-12/02/06	6334286
		Dilution Factor: 1		Analysis Time...: 00:00	

NOTE(S) :

Calculations are performed before rounding to avoid round-off errors in calculated results.

N Spiked analyte recovery is outside stated control limits.

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #...: F6K180195

Work Order #...: JJ27W-SMP
JJ27W-DUP

Matrix.....: WATER

Date Sampled...: 11/17/06 15:08 Date Received...: 11/18/06

PARAM	RESULT	DUPLICATE		RPD	LIMIT	METHOD	PREPARATION-	PREP
		RESULT	UNITS				ANALYSIS	DATE
Total Dissolved Solids							SD Lot-Sample #:	F6K180195-002
	72.0	80.0	mg/L	11	(0-0.0)	MCAWW 160.1	11/20/06	6334178
			Dilution Factor: 1			Analysis Time..: 00:00		
Total Alkalinity							SD Lot-Sample #:	F6K180195-002
	25.0	24.0	mg/L	4.1	(0-20)	MCAWW 310.1	11/30-12/02/06	6334286
			Dilution Factor: 1			Analysis Time..: 00:00		

SAMPLE DUPLICATE EVALUATION REPORT

General Chemistry

Client Lot #...: F6K180195

Work Order #...: JJCRL-SMP
JJCRL-DUP

Matrix.....: WATER

Date Sampled...: 11/07/06 08:32 Date Received...: 11/09/06

<u>PARAM</u>	<u>RESULT</u>	<u>DUPLICATE</u> <u>RESULT</u>	<u>UNITS</u>	<u>RPD</u> <u>LIMIT</u>	<u>METHOD</u>	<u>PREPARATION-</u> <u>ANALYSIS DATE</u>	<u>PREP</u> <u>BATCH #</u>
Nitrate/Nitrite as N	0.094	ND	mg/L	200	(0-20)	SD Lot-Sample #: F6K090297-001 MCAWW 353.1 12/04/06	6339052
				Dilution Factor: 1		Analysis Time...: 00:00	

STL St. Louis

Lot #(s): F6K180195

- 5040 -

Client: MacTech COC/RFA No: 321999 Condition Upon Receipt Form
 Quote No: 71966 Initiated By: [Signature] Date: 11-18-06
 Time: 0900

Shipper Name: FedEx Shipping Information
 Shipping # (s):*
 1. TRK# 8582 9218 4010 6. _____
 2. _____ 7. _____
 3. _____ 8. _____
 4. _____ 9. _____
 5. _____ 10. _____

Multiple Packages Y ☒ N/A

Sample Temperature (s):**

*Numbered shipping lines correspond to Numbered Sample Temp lines

**Sample must be received at 4°C ± 2°C. If not, note contents below. Temperature variance does NOT affect the following: Metals-Liquid or Rad tests-Liquid or Solids

Condition (Circle "Y" for yes, "N" for no and "N/A" for not applicable):

1. ☒ Y ☒ N	Was sample received broken?	8. ☒ Y ☒ N	Sample received with Chain of Custody?
2. ☒ Y ☒ N ☒ N/A	Was sample received with proper pH? (If not, make note below)	9. ☒ Y ☒ N	Chain of Custody matches sample ID's on container(s)?
3. ☒ Y ☒ N	If N/A-Was pH taken by original STL Lab?	10. ☒ Y ☒ N	Are there custody seals present on cooler?
4. ☒ Y ☒ N	Sample received in proper containers?	11. ☒ Y ☒ N ☒ N/A	Do custody seals on cooler appear to be tampered with?
5. ☒ Y ☒ N	Sample volume sufficient for analysis?	12. ☒ Y ☒ N	Are there custody seals present on bottles?
6. ☒ Y ☒ N ☒ N/A	Headspace in VOA or TOX liquid samples? (If Yes, note sample ID's below)	13. ☒ Y ☒ N ☒ N/A	Do custody seals on bottles appear to be tampered with?
7. ☒ Y ☒ N	Were contents of the cooler frisked after opening	14. ☒ Y ☒ N	Was Internal COC/Workshare received?

¹ For DOE-AL (Pantex, LANL, Sandia) sites, pH of ALL containers received must be verified, EXCEPT VOA, TOX and soils.

Notes:

Corrective Action:

- ☐ Client Contact Name: _____
☐ Sample(s) processed "as is"
☐ Sample(s) on hold until: _____

Informed by: _____

Project Management Review: [Signature]Date: 11/21/06

THIS FORM MUST BE COMPLETED AT THE TIME THE ITEMS ARE BEING CHECKED IN. IF ANY ITEM IS COMPLETED BY SOMEONE OTHER THAN THE INITIATOR, THEN THAT PERSON IS REQUIRED TO APPLY THEIR INITIAL AND THE DATE NEXT TO THAT ITEM.

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