

# Analytical and Quality Control Report

William Little  
WTS  
P.O. Box 363  
Building 126 3RD Floor  
WSMR, NM, 88002

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Work Order: 6121406



Project Name: HELSTF Groundwater Samples  
Project Number: 7

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
111695	HLSF-0085-HMW-060-1206	water	2006-12-12	15:00	2006-12-13

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.

This report consists of a total of 23 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.

Dr. Blair Leftwich, Director

## Standard Flags

**B** - The sample contains less than ten times the concentration found in the method blank.

## Analytical Report

**Sample: 111695 - HLSF-0085-HMW-060-1206**

Analysis:	Alkalinity	Analytical Method:	SM 2320B	Prep Method:	N/A
QC Batch:	33076	Date Analyzed:	2006-12-22	Analyzed By:	JG
Prep Batch:	28752	Sample Preparation:	2006-12-22	Prepared By:	JR

Parameter	Flag	RL Result	Units	Dilution	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCo3	1	1.00
Carbonate Alkalinity		<1.00	mg/L as CaCo3	1	1.00
Bicarbonate Alkalinity		<b>206</b>	mg/L as CaCo3	1	4.00
Total Alkalinity		<b>206</b>	mg/L as CaCo3	1	4.00

**Sample: 111695 - HLSF-0085-HMW-060-1206**

Analysis:	Ammonia	Analytical Method:	SM 4500-NH3 B,C	Prep Method:	N/A
QC Batch:	33017	Date Analyzed:	2006-12-21	Analyzed By:	SM
Prep Batch:	28703	Sample Preparation:	2006-12-21	Prepared By:	SM

Parameter	Flag	RL Result	Units	Dilution	RL
Ammonia-N		<1.00	mg/L	1	1.00

**Sample: 111695 - HLSF-0085-HMW-060-1206**

Analysis:	Conductivity	Analytical Method:	SM 2510B	Prep Method:	N/A
QC Batch:	33065	Date Analyzed:	2006-12-19	Analyzed By:	DR
Prep Batch:	28741	Sample Preparation:	2006-12-19	Prepared By:	JR

Parameter	Flag	RL Result	Units	Dilution	RL
Specific Conductance		<b>12500</b>	$\mu$ MHOS/cm	1	0.00

**Sample: 111695 - HLSF-0085-HMW-060-1206**

Analysis:	Dissolved Metals	Analytical Method:	S 6010B	Prep Method:	S 3005A
QC Batch:	32994	Date Analyzed:	2006-12-20	Analyzed By:	RR
Prep Batch:	28613	Sample Preparation:	2006-12-18	Prepared By:	TS

Parameter	Flag	RL Result	Units	Dilution	RL
Dissolved Silver		<0.00200	mg/L	1	0.00200
Dissolved Arsenic		<0.00500	mg/L	1	0.00500
Dissolved Barium		<b>0.0130</b>	mg/L	1	0.0100
Dissolved Cadmium		<b>0.00300</b>	mg/L	1	0.00100
Dissolved Chromium		<0.00500	mg/L	1	0.00500
Dissolved Copper		<0.0125	mg/L	1	0.0125
Dissolved Lead		<0.00500	mg/L	1	0.00500

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sample 111695 continued ...

Parameter	Flag	RL Result	Units	Dilution	RL
Dissolved Selenium		<0.0100	mg/L	1	0.0100
Dissolved Zinc		<0.00500	mg/L	1	0.00500

**Sample: 111695 - HLSF-0085-HMW-060-1206**

Analysis: Hg, Total	Analytical Method: S 7470A	Prep Method: N/A
QC Batch: 33143	Date Analyzed: 2006-12-27	Analyzed By: TS
Prep Batch: 28815	Sample Preparation: 2006-12-26	Prepared By: TS

Parameter	Flag	RL Result	Units	Dilution	RL
Total Mercury		<0.000200	mg/L	1	0.000200

**Sample: 111695 - HLSF-0085-HMW-060-1206**

Analysis: Ion Chromatography	Analytical Method: E 300.0	Prep Method: N/A
QC Batch: 33004	Date Analyzed: 2006-12-14	Analyzed By: WB
Prep Batch: 28664	Sample Preparation: 2006-12-14	Prepared By: WB
QC Batch: 33011	Date Analyzed: 2006-12-16	Analyzed By: WB
Prep Batch: 28701	Sample Preparation: 2006-12-16	Prepared By: WB

Parameter	Flag	RL Result	Units	Dilution	RL
Bromide		<1.00	mg/L	5	0.200
Chloride		1180	mg/L	50	0.500
Fluoride		2.06	mg/L	5	0.200
Nitrite-N		<1.00	mg/L	5	0.200
Nitrate-N		25.7	mg/L	5	0.200
Sulfate		6900	mg/L	500	0.500

**Sample: 111695 - HLSF-0085-HMW-060-1206**

Analysis: K, Dissolved	Analytical Method: S 6010B	Prep Method: S 3005A
QC Batch: 33035	Date Analyzed: 2006-12-21	Analyzed By: RR
Prep Batch: 28613	Sample Preparation: 2006-12-18	Prepared By: TS

Parameter	Flag	RL Result	Units	Dilution	RL
Dissolved Potassium		64.2	mg/L	1	0.500

**Sample: 111695 - HLSF-0085-HMW-060-1206**

Analysis: K, Total	Analytical Method: S 6010B	Prep Method: S 3010A
QC Batch: 33125	Date Analyzed: 2006-12-27	Analyzed By: RR
Prep Batch: 28574	Sample Preparation: 2006-12-15	Prepared By: TS

Parameter	Flag	RL Result	Units	Dilution	RL
Total Potassium		65.9	mg/L	1	0.500

**Sample: 111695 - HLSF-0085-HMW-060-1206**

Analysis: pH	Analytical Method: SM 4500-H+	Prep Method: N/A
QC Batch: 32905	Date Analyzed: 2006-12-13	Analyzed By: JG
Prep Batch: 28612	Sample Preparation: 2006-12-13	Prepared By: JR

Parameter	Flag	RL Result	Units	Dilution	RL
pH		7.49	s.u.	1	0.00

**Sample: 111695 - HLSF-0085-HMW-060-1206**

Analysis: Salts, Dissolved	Analytical Method: S 6010B	Prep Method: S 3005A
QC Batch: 33035	Date Analyzed: 2006-12-21	Analyzed By: RR
Prep Batch: 28613	Sample Preparation: 2006-12-18	Prepared By: TS

Parameter	Flag	RL Result	Units	Dilution	RL
Dissolved Sodium		2910	mg/L	10	0.500

**Sample: 111695 - HLSF-0085-HMW-060-1206**

Analysis: Salts, Total	Analytical Method: S 6010B	Prep Method: S 3010A
QC Batch: 33125	Date Analyzed: 2006-12-27	Analyzed By: RR
Prep Batch: 28574	Sample Preparation: 2006-12-15	Prepared By: TS

Parameter	Flag	RL Result	Units	Dilution	RL
Total Sodium		2920	mg/L	1	0.500

**Sample: 111695 - HLSF-0085-HMW-060-1206**

Analysis: TDS	Analytical Method: SM 2540C	Prep Method: N/A
QC Batch: 33071	Date Analyzed: 2006-12-18	Analyzed By: JG
Prep Batch: 28747	Sample Preparation: 2006-12-18	Prepared By: JR

Parameter	Flag	RL Result	Units	Dilution	RL
Total Dissolved Solids		11600	mg/L	1	5.00

**Sample: 111695 - HLSF-0085-HMW-060-1206**

Analysis: Total Metals Analytical Method: S 6010B Prep Method: S 3010A  
 QC Batch: 33099 Date Analyzed: 2006-12-26 Analyzed By: RR  
 Prep Batch: 28574 Sample Preparation: 2006-12-15 Prepared By: TS

Parameter	Flag	RL Result	Units	Dilution	RL
Total Silver		<0.00200	mg/L	1	0.00200
Total Arsenic		<0.0100	mg/L	1	0.0100
Total Barium		<b>0.0140</b>	mg/L	1	0.0100
Total Cadmium		<b>0.00300</b>	mg/L	1	0.00100
Total Chromium		<0.00500	mg/L	1	0.00500
Total Copper		<0.00500	mg/L	1	0.00500
Total Phosphorous		<b>0.0820</b>	mg/L	1	0.0500
Total Lead		<0.00500	mg/L	1	0.00500
Total Selenium		<0.0100	mg/L	1	0.0100
Total Zinc		<0.00500	mg/L	1	0.00500

**Method Blank (1) QC Batch: 32994**

QC Batch: 32994 Date Analyzed: 2006-12-20 Analyzed By: RR  
 Prep Batch: 28613 QC Preparation: 2006-12-18 Prepared By: TS

Parameter	Flag	MDL Result	Units	RL
Dissolved Silver		<0.000199	mg/L	0.002
Dissolved Arsenic		<0.00360	mg/L	0.005
Dissolved Barium		<0.000450	mg/L	0.01
Dissolved Cadmium		<0.000577	mg/L	0.001
Dissolved Chromium		<0.00357	mg/L	0.005
Dissolved Copper		<0.00127	mg/L	0.0125
Dissolved Lead		<0.00398	mg/L	0.005
Dissolved Selenium		<0.00556	mg/L	0.01
Dissolved Zinc		<0.00300	mg/L	0.005

**Method Blank (1) QC Batch: 33004**

QC Batch: 33004 Date Analyzed: 2006-12-14 Analyzed By: WB  
 Prep Batch: 28664 QC Preparation: 2006-12-14 Prepared By: WB

Parameter	Flag	MDL Result	Units	RL
Bromide		<0.0429	mg/L	0.2
Fluoride		<0.0119	mg/L	0.2
Nitrite-N		<0.0128	mg/L	0.2
Nitrate-N		<0.0106	mg/L	0.2

**Method Blank (I)**    QC Batch: 33011QC Batch: 33011  
Prep Batch: 28701Date Analyzed: 2006-12-16  
QC Preparation: 2006-12-16Analyzed By: WB  
Prepared By: WB

Parameter	Flag	MDL Result	Units	RL
Chloride		<0.0181	mg/L	0.5
Sulfate		<0.0485	mg/L	0.5

**Method Blank (I)**    QC Batch: 33017QC Batch: 33017  
Prep Batch: 28703Date Analyzed: 2006-12-21  
QC Preparation: 2006-12-21Analyzed By: SM  
Prepared By: SM

Parameter	Flag	MDL Result	Units	RL
Ammonia-N		<0.820	mg/L	1

**Method Blank (I)**    QC Batch: 33035QC Batch: 33035  
Prep Batch: 28613Date Analyzed: 2006-12-21  
QC Preparation: 2006-12-18Analyzed By: RR  
Prepared By: TS

Parameter	Flag	MDL Result	Units	RL
Dissolved Potassium		<0.0297	mg/L	0.5

**Method Blank (I)**    QC Batch: 33035QC Batch: 33035  
Prep Batch: 28613Date Analyzed: 2006-12-21  
QC Preparation: 2006-12-18Analyzed By: RR  
Prepared By: TS

Parameter	Flag	MDL Result	Units	RL
Dissolved Sodium		<0.0309	mg/L	0.5

**Method Blank (I)**    QC Batch: 33065QC Batch: 33065  
Prep Batch: 28741Date Analyzed: 2006-12-19  
QC Preparation: 2006-12-19Analyzed By: DR  
Prepared By: DR*continued ...*

method blank continued...

Parameter	Flag	MDL Result	Units	RL
Parameter	Flag	MDL Result	Units	RL
Specific Conductance		0.00	µMHOS/cm	

**Method Blank (1)** QC Batch: 33071

QC Batch: 33071                      Date Analyzed: 2006-12-18                      Analyzed By: JG  
Prep Batch: 28747                      QC Preparation: 2006-12-18                      Prepared By: JG

Parameter	Flag	MDL Result	Units	RL
Total Dissolved Solids		<5.00	mg/L	5

**Method Blank (1)** QC Batch: 33076

QC Batch: 33076                      Date Analyzed: 2006-12-22                      Analyzed By: JG  
Prep Batch: 28752                      QC Preparation: 2006-12-22                      Prepared By: JG

Parameter	Flag	MDL Result	Units	RL
Hydroxide Alkalinity		<1.00	mg/L as CaCo3	1
Carbonate Alkalinity		<1.00	mg/L as CaCo3	1
Bicarbonate Alkalinity		<4.00	mg/L as CaCo3	4
Total Alkalinity		<2.38	mg/L as CaCo3	4

**Method Blank (1)** QC Batch: 33099

QC Batch: 33099                      Date Analyzed: 2006-12-26                      Analyzed By: RR  
Prep Batch: 28574                      QC Preparation: 2006-12-15                      Prepared By: TS

Parameter	Flag	MDL Result	Units	RL
Total Silver		<0.000274	mg/L	0.002
Total Arsenic		<0.00489	mg/L	0.01
Total Barium		<0.000450	mg/L	0.01
Total Cadmium		<0.000268	mg/L	0.001
Total Chromium		<0.00357	mg/L	0.005
Total Copper		<0.00127	mg/L	0.005
Total Phosphorous		<0.0229	mg/L	0.05
Total Lead		<0.00310	mg/L	0.005
Total Selenium		<0.00556	mg/L	0.01
Total Zinc		<0.000666	mg/L	0.005

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**Method Blank (1)** QC Batch: 33125QC Batch: 33125  
Prep Batch: 28574Date Analyzed: 2006-12-27  
QC Preparation: 2006-12-15Analyzed By: RR  
Prepared By: TS

Parameter	Flag	MDL Result	Units	RL
Total Potassium		<0.0297	mg/L	0.5

**Method Blank (1)** QC Batch: 33125QC Batch: 33125  
Prep Batch: 28574Date Analyzed: 2006-12-27  
QC Preparation: 2006-12-15Analyzed By: RR  
Prepared By: TS

Parameter	Flag	MDL Result	Units	RL
Total Sodium		<0.0309	mg/L	0.5

**Method Blank (1)** QC Batch: 33143QC Batch: 33143  
Prep Batch: 28815Date Analyzed: 2006-12-27  
QC Preparation: 2006-12-27Analyzed By: TS  
Prepared By: TS

Parameter	Flag	MDL Result	Units	RL
Total Mercury		<0.0000217	mg/L	0.0002

**Duplicates (1)**QC Batch: 32905  
Prep Batch: 28612Date Analyzed: 2006-12-13  
QC Preparation: 2006-12-13Analyzed By: JG  
Prepared By: DR

Param	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
pH	7.11	7.12	s.u.	1	0	20

**Duplicates (1)**QC Batch: 33065  
Prep Batch: 28741Date Analyzed: 2006-12-19  
QC Preparation: 2006-12-19Analyzed By: DR  
Prepared By: DR

Param	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Specific Conductance	53600	53700	$\mu$ MHOS/cm	1	0	6.7

**Duplicates (1)**QC Batch: 33071  
Prep Batch: 28747Date Analyzed: 2006-12-18  
QC Preparation: 2006-12-18Analyzed By: JG  
Prepared By: JG

Param	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Total Dissolved Solids	53500	53200	mg/L	1	1	20

**Duplicates (1)**QC Batch: 33076  
Prep Batch: 28752Date Analyzed: 2006-12-22  
QC Preparation: 2006-12-22Analyzed By: JG  
Prepared By: JG

Param	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Hydroxide Alkalinity	<1.00	<1.00	mg/L as CaCo3	1	0	6.3
Carbonate Alkalinity	<1.00	<1.00	mg/L as CaCo3	1	0	6.3
Bicarbonate Alkalinity	132	134	mg/L as CaCo3	1	2	6.3
Total Alkalinity	132	134	mg/L as CaCo3	1	2	6.3

**Laboratory Control Spike (LCS-1)**QC Batch: 32994  
Prep Batch: 28613Date Analyzed: 2006-12-20  
QC Preparation: 2006-12-18Analyzed By: RR  
Prepared By: TS

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Silver	0.127	mg/L	1	0.125	<0.000199	102	86.2 - 116
Dissolved Arsenic	0.464	mg/L	1	0.500	<0.00360	93	78.7 - 116
Dissolved Barium	0.957	mg/L	1	1.00	<0.000450	96	85 - 114
Dissolved Cadmium	0.240	mg/L	1	0.250	<0.000577	96	83.3 - 113
Dissolved Chromium	0.0980	mg/L	1	0.100	<0.00357	98	83 - 112
Dissolved Copper	0.126	mg/L	1	0.125	<0.00127	101	84.3 - 114
Dissolved Lead	0.503	mg/L	1	0.500	<0.00398	101	81.1 - 111
Dissolved Selenium	0.422	mg/L	1	0.500	<0.00556	84	69.6 - 111
Dissolved Zinc	0.225	mg/L	1	0.250	<0.00300	90	84.7 - 113

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Silver	0.124	mg/L	1	0.125	<0.000199	99	86.2 - 116	2	20
Dissolved Arsenic	0.467	mg/L	1	0.500	<0.00360	93	78.7 - 116	1	20
Dissolved Barium	0.942	mg/L	1	1.00	<0.000450	94	85 - 114	2	20
Dissolved Cadmium	0.236	mg/L	1	0.250	<0.000577	94	83.3 - 113	2	20
Dissolved Chromium	0.0980	mg/L	1	0.100	<0.00357	98	83 - 112	0	20
Dissolved Copper	0.123	mg/L	1	0.125	<0.00127	98	84.3 - 114	2	20
Dissolved Lead	0.479	mg/L	1	0.500	<0.00398	96	81.1 - 111	5	20
Dissolved Selenium	0.423	mg/L	1	0.500	<0.00556	85	69.6 - 111	0	20
Dissolved Zinc	0.223	mg/L	1	0.250	<0.00300	89	84.7 - 113	1	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

**Laboratory Control Spike (LCS-1)**QC Batch: 33004  
Prep Batch: 28664Date Analyzed: 2006-12-14  
QC Preparation: 2006-12-14Analyzed By: WB  
Prepared By: WB

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Bromide	2.73	mg/L	1	2.50	<0.0429	109	90 - 110
Fluoride	2.72	mg/L	1	2.50	<0.0119	109	90 - 110
Nitrite-N	2.72	mg/L	1	2.50	<0.0128	109	90 - 110
Nitrate-N	2.76	mg/L	1	2.50	<0.0106	110	90 - 110

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Bromide	2.73	mg/L	1	2.50	<0.0429	109	90 - 110	0	20
Fluoride	2.75	mg/L	1	2.50	<0.0119	110	90 - 110	1	20
Nitrite-N	2.73	mg/L	1	2.50	<0.0128	109	90 - 110	0	20
Nitrate-N	2.72	mg/L	1	2.50	<0.0106	109	90 - 110	1	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

**Laboratory Control Spike (LCS-1)**QC Batch: 33011  
Prep Batch: 28701Date Analyzed: 2006-12-16  
QC Preparation: 2006-12-16Analyzed By: WB  
Prepared By: WB

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride	12.3	mg/L	1	12.5	<0.0181	98	90 - 110
Sulfate	12.9	mg/L	1	12.5	<0.0485	104	90 - 110

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride	12.2	mg/L	1	12.5	<0.0181	98	90 - 110	0	20
Sulfate	12.7	mg/L	1	12.5	<0.0485	101	90 - 110	2	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

**Laboratory Control Spike (LCS-1)**QC Batch: 33017  
Prep Batch: 28703Date Analyzed: 2006-12-21  
QC Preparation: 2006-12-21Analyzed By: SM  
Prepared By: SM

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Ammonia-N	4.42	mg/L	1	5.00	<0.820	88	66 - 122

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.



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Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Total Lead	0.499	mg/L	1	0.500	<0.00310	100	83 - 109
Total Selenium	0.421	mg/L	1	0.500	<0.00556	84	75 - 112
Total Zinc	0.231	mg/L	1	0.250	<0.000666	92	82.9 - 109

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Total Silver	0.119	mg/L	1	0.125	<0.000274	95	87.9 - 111	1	20
Total Arsenic	0.459	mg/L	1	0.500	<0.00489	92	86.8 - 108	1	20
Total Barium	0.992	mg/L	1	1.00	<0.000450	99	88.8 - 110	0	20
Total Cadmium	0.238	mg/L	1	0.250	<0.000268	95	86.8 - 110	0	20
Total Chromium	0.102	mg/L	1	0.100	<0.00357	102	86.5 - 115	1	20
Total Copper	0.125	mg/L	1	0.125	<0.00127	100	83.4 - 117	1	20
Total Phosphorous	0.464	mg/L	1	0.500	<0.0229	93	87.3 - 114	7	20
Total Lead	0.514	mg/L	1	0.500	<0.00310	103	83 - 109	3	20
Total Selenium	0.430	mg/L	1	0.500	<0.00556	86	75 - 112	2	20
Total Zinc	0.227	mg/L	1	0.250	<0.000666	91	82.9 - 109	2	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

**Laboratory Control Spike (LCS-1)**QC Batch: 33125  
Prep Batch: 28574Date Analyzed: 2006-12-27  
QC Preparation: 2006-12-15Analyzed By: RR  
Prepared By: TS

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Total Potassium	55.8	mg/L	1	50.0	<0.0297	112	85 - 116.2

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Total Potassium	57.3	mg/L	1	50.0	<0.0297	115	85 - 116.2	3	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

**Laboratory Control Spike (LCS-1)**QC Batch: 33125  
Prep Batch: 28574Date Analyzed: 2006-12-27  
QC Preparation: 2006-12-15Analyzed By: RR  
Prepared By: TS

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Total Sodium	56.6	mg/L	1	50.0	<0.0309	113	87.1 - 120

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Total Sodium	57.1	mg/L	1	50.0	<0.0309	114	87.1 - 120	1	20



**Matrix Spike (MS-1)** Spiked Sample: 111687

QC Batch: 33004  
Prep Batch: 28664

Date Analyzed: 2006-12-14  
QC Preparation: 2006-12-14

Analyzed By: WB  
Prepared By: WB

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Bromide	254	mg/L	200	250	<8.58	102	95.4 - 114
Fluoride	247	mg/L	200	250	<2.38	98	73.4 - 119
Nitrite-N	245	mg/L	1	250	<0.0128	98	58.3 - 151
Nitrate-N	282	mg/L	200	250	21.1	104	85.7 - 123

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Bromide	252	mg/L	200	250	<8.58	101	95.4 - 114	1	20
Fluoride	258	mg/L	200	250	<2.38	102	73.4 - 119	4	20
Nitrite-N	244	mg/L	1	250	<0.0128	98	58.3 - 151	0	20
Nitrate-N	294	mg/L	200	250	21.1	109	85.7 - 123	4	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

**Matrix Spike (MS-1)** Spiked Sample: 111695

QC Batch: 33011  
Prep Batch: 28701

Date Analyzed: 2006-12-16  
QC Preparation: 2006-12-16

Analyzed By: WB  
Prepared By: WB

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride	7410	mg/L	500	6250	1180	100	10 - 6384
Sulfate	13600	mg/L	500	6250	6900	107	86.2 - 117

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride	7480	mg/L	500	6250	1180	101	10 - 6384	1	20
Sulfate	13100	mg/L	500	6250	6900	99	86.2 - 117	4	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

**Matrix Spike (MS-1)** Spiked Sample: 111619

QC Batch: 33017  
Prep Batch: 28703

Date Analyzed: 2006-12-21  
QC Preparation: 2006-12-21

Analyzed By: SM  
Prepared By: SM

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Ammonia-N	3.98	mg/L	1	5.00	<0.820	80	58 - 134

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Ammonia-N	3.53	mg/L	1	5.00	<0.820	71	58 - 134	12	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

**Matrix Spike (MS-1)** Spiked Sample: 111614

QC Batch: 33035 Date Analyzed: 2006-12-21 Analyzed By: RR  
Prep Batch: 28613 QC Preparation: 2006-12-18 Prepared By: TS

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Potassium	48.3	mg/L	1	50.0	<0.0297	97	75 - 125

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Potassium	48.5	mg/L	1	50.0	<0.0297	97	75 - 125	0	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

**Matrix Spike (MS-1)** Spiked Sample: 111614

QC Batch: 33035 Date Analyzed: 2006-12-21 Analyzed By: RR  
Prep Batch: 28613 QC Preparation: 2006-12-18 Prepared By: TS

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Dissolved Sodium	2040	mg/L	1	50.0	2000	80	75 - 125

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Dissolved Sodium	2040	mg/L	1	50.0	2000	80	75 - 125	0	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

**Matrix Spike (MS-1)** Spiked Sample: 111695

QC Batch: 33099 Date Analyzed: 2006-12-26 Analyzed By: RR  
Prep Batch: 28574 QC Preparation: 2006-12-15 Prepared By: TS

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Total Silver	0.119	mg/L	1	0.125	<0.000274	95	88.2 - 114
Total Arsenic	0.418	mg/L	1	0.500	<0.00489	84	75.9 - 116
Total Barium	0.956	mg/L	1	1.00	0.014	94	64.9 - 129
Total Cadmium	0.228	mg/L	1	0.250	0.003	90	66.5 - 121
Total Chromium	0.0860	mg/L	1	0.100	<0.00357	86	69.2 - 129
Total Copper	0.119	mg/L	1	0.125	0.003	93	83.8 - 118
Total Phosphorous	0.567	mg/L	1	0.500	0.082	97	70.1 - 115

*continued ...*

matrix spikes continued...

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Total Lead	0.446	mg/L	1	0.500	<0.00310	89	71.9 - 115
Total Selenium	0.445	mg/L	1	0.500	<0.00556	89	66.8 - 116
Total Zinc	0.224	mg/L	1	0.250	<0.000666	90	75.5 - 113

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Total Silver	0.117	mg/L	1	0.125	<0.000274	94	88.2 - 114	2	20
Total Arsenic	0.436	mg/L	1	0.500	<0.00489	87	75.9 - 116	4	20
Total Barium	0.930	mg/L	1	1.00	0.014	92	64.9 - 129	3	20
Total Cadmium	0.223	mg/L	1	0.250	0.003	88	66.5 - 121	2	20
Total Chromium	0.0890	mg/L	1	0.100	<0.00357	89	69.2 - 129	3	20
Total Copper	0.119	mg/L	1	0.125	0.003	93	83.8 - 118	0	20
Total Phosphorous	0.578	mg/L	1	0.500	0.082	99	70.1 - 115	2	20
Total Lead	0.462	mg/L	1	0.500	<0.00310	92	71.9 - 115	4	20
Total Selenium	0.420	mg/L	1	0.500	<0.00556	84	66.8 - 116	6	20
Total Zinc	0.226	mg/L	1	0.250	<0.000666	90	75.5 - 113	1	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

**Matrix Spike (MS-1) Spiked Sample: 111614**

QC Batch: 33125 Date Analyzed: 2006-12-27 Analyzed By: RR  
Prep Batch: 28574 QC Preparation: 2006-12-15 Prepared By: TS

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Total Potassium	47.2	mg/L	1	50.0	<0.0297	94	75 - 125

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Total Potassium	49.8	mg/L	1	50.0	<0.0297	100	75 - 125	5	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

**Matrix Spike (MS-1) Spiked Sample: 111614**

QC Batch: 33125 Date Analyzed: 2006-12-27 Analyzed By: RR  
Prep Batch: 28574 QC Preparation: 2006-12-15 Prepared By: TS

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Total Sodium	2150	mg/L	1	50.0	2100	100	75 - 125

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Total Sodium	2150	mg/L	1	50.0	2100	100	75 - 125	0	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

**Matrix Spike (MS-1)** Spiked Sample: 112194

QC Batch: 33143  
Prep Batch: 28815

Date Analyzed: 2006-12-27  
QC Preparation: 2006-12-27

Analyzed By: TS  
Prepared By: TS

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Total Mercury	0.000980	mg/L	1	0.00100	<0.0000217	98	49.1 - 137

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Total Mercury	0.000980	mg/L	1	0.00100	<0.0000217	98	49.1 - 137	0	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

**Standard (ICV-1)**

QC Batch: 32905

Date Analyzed: 2006-12-13

Analyzed By: JG

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
pH		s.u.	7.00	6.97	100	98.8 - 101	2006-12-13

**Standard (CCV-1)**

QC Batch: 32905

Date Analyzed: 2006-12-13

Analyzed By: JG

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
pH		s.u.	7.00	6.97	100	98.8 - 101	2006-12-13

**Standard (ICV-1)**

QC Batch: 32994

Date Analyzed: 2006-12-20

Analyzed By: RR

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Silver		mg/L	0.125	0.122	98	90 - 110	2006-12-20
Dissolved Arsenic		mg/L	1.00	0.974	97	90 - 110	2006-12-20
Dissolved Barium		mg/L	1.00	0.986	99	90 - 110	2006-12-20
Dissolved Cadmium		mg/L	1.00	0.954	95	95 - 105	2006-12-20
Dissolved Chromium		mg/L	1.00	0.954	95	90 - 110	2006-12-20
Dissolved Copper		mg/L	1.00	0.976	98	90 - 110	2006-12-20
Dissolved Lead		mg/L	1.00	1.00	100	90 - 110	2006-12-20
Dissolved Selenium		mg/L	1.00	0.970	97	90 - 110	2006-12-20

*continued...*



Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.5	12.3	98	90 - 110	2006-12-16
Sulfate		mg/L	12.5	12.7	102	90 - 110	2006-12-16

**Standard (CCV-1)**

QC Batch: 33011

Date Analyzed: 2006-12-16

Analyzed By: WB

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	12.5	12.3	99	90 - 110	2006-12-16
Sulfate		mg/L	12.5	12.6	101	90 - 110	2006-12-16

**Standard (ICV-1)**

QC Batch: 33017

Date Analyzed: 2006-12-21

Analyzed By: SM

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Ammonia-N		mg/L	5.00	4.98	100	85 - 115	2006-12-21

**Standard (CCV-1)**

QC Batch: 33017

Date Analyzed: 2006-12-21

Analyzed By: SM

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Ammonia-N		mg/L	5.00	4.82	96	85 - 115	2006-12-21

**Standard (ICV-1)**

QC Batch: 33035

Date Analyzed: 2006-12-21

Analyzed By: RR

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Potassium		mg/L	50.0	51.3	103	90 - 110	2006-12-21

**Standard (ICV-1)**

QC Batch: 33035

Date Analyzed: 2006-12-21

Analyzed By: RR

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Sodium		mg/L	50.0	52.0	104	90 - 110	2006-12-21

**Standard (CCV-1)**

QC Batch: 33035

Date Analyzed: 2006-12-21

Analyzed By: RR

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Potassium		mg/L	50.0	53.8	108	90 - 110	2006-12-21

**Standard (CCV-1)**

QC Batch: 33035

Date Analyzed: 2006-12-21

Analyzed By: RR

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Dissolved Sodium		mg/L	50.0	54.0	108	90 - 110	2006-12-21

**Standard (ICV-1)**

QC Batch: 33065

Date Analyzed: 2006-12-19

Analyzed By: DR

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Specific Conductance		$\mu$ MHOS/cm	1410	1410	100	96.7 - 108	2006-12-19

**Standard (CCV-1)**

QC Batch: 33065

Date Analyzed: 2006-12-19

Analyzed By: DR

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Specific Conductance		$\mu$ MHOS/cm	1410	1420	100	96.7 - 108	2006-12-19

**Standard (ICV-1)**

QC Batch: 33071

Date Analyzed: 2006-12-18

Analyzed By: JG

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	999	100	94.4 - 106	2006-12-18

**Standard (CCV-1)**

QC Batch: 33071

Date Analyzed: 2006-12-18

Analyzed By: JG

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Dissolved Solids		mg/L	1000	992	99	94.4 - 106	2006-12-18

**Standard (ICV-1)**

QC Batch: 33076

Date Analyzed: 2006-12-22

Analyzed By: JG

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Hydroxide Alkalinity		mg/L as CaCo3	0.00	<1.00		0 - 105	2006-12-22
Carbonate Alkalinity		mg/L as CaCo3	0.00	224		0 - 105	2006-12-22
Bicarbonate Alkalinity		mg/L as CaCo3	0.00	14.0		0 - 105	2006-12-22
Total Alkalinity		mg/L as CaCo3	250	238	95	93.7 - 99.9	2006-12-22

**Standard (CCV-1)**

QC Batch: 33076

Date Analyzed: 2006-12-22

Analyzed By: JG

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Hydroxide Alkalinity		mg/L as CaCo3	0.00	<1.00		0 - 105	2006-12-22
Carbonate Alkalinity		mg/L as CaCo3	0.00	220		0 - 105	2006-12-22
Bicarbonate Alkalinity		mg/L as CaCo3	0.00	28.0		0 - 105	2006-12-22
Total Alkalinity		mg/L as CaCo3	250	248	99	93.7 - 99.9	2006-12-22

**Standard (ICV-1)**

QC Batch: 33099

Date Analyzed: 2006-12-26

Analyzed By: RR

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Silver		mg/L	0.125	0.127	102	90 - 110	2006-12-26
Total Arsenic		mg/L	1.00	1.00	100	90 - 110	2006-12-26
Total Barium		mg/L	1.00	1.01	101	90 - 110	2006-12-26
Total Cadmium		mg/L	1.00	0.971	97	90 - 110	2006-12-26
Total Chromium		mg/L	1.00	0.967	97	90 - 110	2006-12-26
Total Copper		mg/L	1.00	1.00	100	90 - 110	2006-12-26
Total Phosphorous		mg/L	5.00	4.90	98	90 - 110	2006-12-26
Total Lead		mg/L	1.00	1.02	102	90 - 110	2006-12-26
Total Selenium		mg/L	1.00	0.983	98	90 - 110	2006-12-26
Total Zinc		mg/L	1.00	1.04	104	90 - 110	2006-12-26

**Standard (CCV-1)**

QC Batch: 33099

Date Analyzed: 2006-12-26

Analyzed By: RR

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Silver		mg/L	0.125	0.131	105	90 - 110	2006-12-26
Total Arsenic		mg/L	1.00	1.07	107	90 - 110	2006-12-26
Total Barium		mg/L	1.00	1.05	105	90 - 110	2006-12-26
Total Cadmium		mg/L	1.00	1.03	103	90 - 110	2006-12-26
Total Chromium		mg/L	1.00	1.02	102	90 - 110	2006-12-26
Total Copper		mg/L	1.00	1.03	103	90 - 110	2006-12-26
Total Phosphorous		mg/L	5.00	5.43	109	90 - 110	2006-12-26
Total Lead		mg/L	1.00	1.03	103	90 - 110	2006-12-26
Total Selenium		mg/L	1.00	1.06	106	90 - 110	2006-12-26
Total Zinc		mg/L	1.00	1.07	107	90 - 110	2006-12-26

**Standard (ICV-1)**

QC Batch: 33125

Date Analyzed: 2006-12-27

Analyzed By: RR

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Potassium		mg/L	50.0	52.0	104	90 - 110	2006-12-27

**Standard (ICV-1)**

QC Batch: 33125

Date Analyzed: 2006-12-27

Analyzed By: RR

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Sodium		mg/L	50.0	51.7	103	90 - 110	2006-12-27

**Standard (CCV-1)**

QC Batch: 33125

Date Analyzed: 2006-12-27

Analyzed By: RR

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Potassium		mg/L	50.0	47.9	96	90 - 110	2006-12-27

**Standard (CCV-1)**

QC Batch: 33125

Date Analyzed: 2006-12-27

Analyzed By: RR

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Sodium		mg/L	50.0	48.6	97	90 - 110	2006-12-27

**Standard (ICV-1)**

QC Batch: 33143

Date Analyzed: 2006-12-27

Analyzed By: TS

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Mercury		mg/L	0.00100	0.00108	108	80 - 120	2006-12-27

**Standard (CCV-1)**

QC Batch: 33143

Date Analyzed: 2006-12-27

Analyzed By: TS

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Total Mercury		mg/L	0.00100	0.00103	103	80 - 120	2006-12-27