



02/05/10

## Technical Report for

**Olsson Associates**

**Table 910-1**

**009-0807 T200**

**Accutest Job Number: D10204**

**Sampling Date: 12/29/09**

### Report to:

**Olsson Associates  
826 21 1/2 Road  
Grand Junction, CO 81505  
kkreie@oaconsulting.com**

**ATTN: Ken Kreie**

**Total number of pages in report: 30**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

**Gary K. Ward  
Laboratory Director**

**Client Service contact: Andrea Engelbrecht 303-425-6021**

Certifications: CO, ID, NE, NM, ND (R-027) (PW) UT (NELAP CO00049)

This report shall not be reproduced, except in its entirety, without the written approval of Accutest Laboratories.  
Test results relate only to samples analyzed.

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Sample Summary

Olsson Associates

Job No: D10204

Table 910-1  
Project No: 009-0807 T200

Sample Number	Collected		Matrix Code	Type	Client Sample ID
	Date	Time By			
D10204-1	12/29/09	13:30 KK	01/07/10	SO Soil	BG
D10204-2	12/29/09	14:00 KK	01/07/10	SO Soil	PIT

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

## CASE NARRATIVE / CONFORMANCE SUMMARY

**Client:** Olsson Associates**Job No** D10204**Site:** Table 910-1**Report Dat** 2/3/2010 10:19:18 AM

On 01/07/2010, two (2) samples were received at Accutest Laboratories at a temperature of 5.9°C. The samples were intact and properly preserved, unless noted below. An Accutest Job Number of D10204 was assigned to the project. The laboratory sample IDs, client sample IDs, and dates of sample collection are detailed in the report's Results Summary Section.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

### Metals By Method SW846 6010B

**Matrix** SO**Batch ID:** MP1148

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.

### Metals By Method SW846 6020

**Matrix** SO**Batch ID:** MP1104

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Samples D10204-1DUP, D10204-1MS, D10204-1MSD, and D10204-1SDL were used as the QC samples for the metals analysis.
- The Serial Dilution RPD for Arsenic is outside control limits for sample MP1104-SD1. Probable cause due to sample homogeneity.

### Wet Chemistry By Method SM19 2540B M

**Matrix** SO**Batch ID:** GN2805

- The data for SM19 2540B M meets quality control requirements.

Accutest certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting Accutest's Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

Accutest Laboratories is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. Data release is authorized by Accutest Laboratories indicated via signature on the report cover

## SAMPLE DELIVERY GROUP CASE NARRATIVE

**Client:** Accutest Mountain States

**Job No** D10204

**Site:** CORCCOGJ: Table 910-1

**Report Date** 2/4/2010 8:38:48 AM

1 Sample was collected on 12/29/2009 and were received at Accutest on 01/07/2010 properly preserved, at 1.9 Deg. C and intact. These Samples received an Accutest job number of D10204. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

### Metals By Method SW846 6010B

**Matrix** SO

**Batch ID:** MP14764

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D10286-2MS, D10286-2MSD, D10286-2SDL were used as the QC samples for metals.

The Accutest Laboratories of New England certifies that all analysis were performed within method specification. It is further recommended that this report to be used in its entirety. The Accutest Laboratories of NE, Laboratory Director or assignee as verified by the signature on the cover page has authorized the release of this report(D10204).



## Sample Results

## Report of Analysis

Report of Analysis

<b>Client Sample ID:</b>	BG		
<b>Lab Sample ID:</b>	D10204-1	<b>Date Sampled:</b>	12/29/09
<b>Matrix:</b>	SO - Soil	<b>Date Received:</b>	01/07/10
		<b>Percent Solids:</b>	91.8
<b>Project:</b>	Table 910-1		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	5.8	0.34	mg/kg	1	01/15/10	01/17/10 SES	SW846 6020 <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: MA325  
(2) Prep QC Batch: MP1104

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	PIT	<b>Date Sampled:</b>	12/29/09
<b>Lab Sample ID:</b>	D10204-2	<b>Date Received:</b>	01/07/10
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	85.9
<b>Project:</b>	Table 910-1		

Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Barium <sup>a</sup>	5540	110	mg/kg	5	02/03/10	02/03/10	AMA SW846 6010B <sup>1</sup>	SW846 3050B <sup>2</sup>

(1) Instrument QC Batch: M:MA11431  
(2) Prep QC Batch: M:MP14764  
  
(a) Analysis performed at Accutest Laboratories, Marlborough, MA.

RL = Reporting Limit





## Misc. Forms

### Custody Documents and Other Forms

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Includes the following where applicable:

- Chain of Custody





## Metals Analysis

### QC Data Summaries

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Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D10204  
Account: CORCCOGJ - Olsson Associates  
Project: Table 910-1

QC Batch ID: MP1104  
Matrix Type: SOLID

Methods: SW846 6020  
Units: mg/kg

Prep Date: 01/15/10

Metal	RL	IDL	MDL	MB raw	final
Aluminum	25	.24	.89		
Arsenic	0.40	.058	.26	-0.037	<0.40
Calcium	200	2.6	6.1		
Copper	1.0	.0045	.14		
Iron	20	2.1	6.1		
Lead	0.25	.0013	.18		
Magnesium	50	.096	1.3		
Potassium	100	4.3	9.1		
Sodium	250	.25	1.8		
Uranium	0.25	.0005	.12		

Associated samples MP1104: D10204-1

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D10204  
 Account: CORCCOGJ - Olsson Associates  
 Project: Table 910-1

QC Batch ID: MP1104  
 Matrix Type: SOLID

Methods: SW846 6020  
 Units: mg/kg

Prep Date:

01/15/10

01/15/10

Metal	D10204-1		QC	D10204-1		Spikelot	% Rec	QC
	Original	DUP	RPD	Original	MS	MPICPR1		Limits
Aluminum								
Arsenic	5.8	6.6	12.9	0-20	5.8	89.1	90	92.5
Calcium								60-119
Copper								
Iron								
Lead								
Magnesium								
Potassium								
Sodium								
Uranium								

Associated samples MP1104: D10204-1

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D10204  
Account: CORCCOGJ - Olsson Associates  
Project: Table 910-1

QC Batch ID: MP1104  
Matrix Type: SOLID

Methods: SW846 6020  
Units: mg/kg

Prep Date: 01/15/10

Metal	D10204-1 Original	MSD	Spikelot MPICPR1	% Rec	MSD RPD	QC Limit
Aluminum						
Arsenic	5.8	87.1	87.1	93.3	2.3	20
Calcium						
Copper						
Iron						
Lead						
Magnesium						
Potassium						
Sodium						
Uranium						

Associated samples MP1104: D10204-1

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(N) Matrix Spike Rec. outside of QC limits  
(anr) Analyte not requested

## 5.1.3

Account: CORCCOGJ - Olsson Associates  
Project: Table 910-1

Methods: SW846 6020  
Units: mg/kg

Metal	LCS Result	Spikelot MPLCD064	% Rec	QC Limits
Aluminum				
Arsenic	151	158	95.6	82-118
Calcium				
Copper				
Iron				
Lead				
Magnesium				
Potassium				
Sodium				
Uranium				

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

# SERIAL DILUTION RESULTS SUMMARY

Login Number: D10204  
 Account: CORCCOGJ - Olsson Associates  
 Project: Table 910-1

QC Batch ID: MP1104  
 Matrix Type: SOLID

Methods: SW846 6020  
 Units: ug/l

Prep Date: 01/15/10

Metal	D10204-1		QC	
	Original	SDL 1:5	%DIF	Limits
Aluminum				
Arsenic	13.5	12.2	10.3*(a)	0-10
Calcium				
Copper				
Iron				
Lead				
Magnesium				
Potassium				
Sodium				
Uranium				

Associated samples MP1104: D10204-1

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (anr) Analyte not requested  
 (a) Serial dilution indicates possible matrix interference.

5.1.4

5





## Misc. Forms

### Custody Documents and Other Forms

(Accutest Labs of New England, Inc.)

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Includes the following where applicable:

- Chain of Custody





## Accutest Laboratories Sample Receipt Summary

Accutest Job Number: D10204

Client: AMS

Immediate Client Services Action Required: No

Date / Time Received: 2/3/2010 10:30:00 AM

No. Coolers: 1

Client Service Action Required at Login: No

Project: SUB

Airbill #'s: NA

### Cooler Security

Y or N

Y or N

- |                           |                                     |                          |                       |                                     |                          |
|---------------------------|-------------------------------------|--------------------------|-----------------------|-------------------------------------|--------------------------|
| 1. Custody Seals Present: | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 3. COC Present:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Custody Seals Intact:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 4. Smpl Dates/Time OK | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Cooler Temperature

Y or N

- |                              |                                     |                          |
|------------------------------|-------------------------------------|--------------------------|
| 1. Temp criteria achieved:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Cooler temp verification: | Infrared gun                        |                          |
| 3. Cooler media:             | Ice (bag)                           |                          |

### Quality Control Preservation

Y or N

N/A

- |                                 |                                     |                          |                                     |
|---------------------------------|-------------------------------------|--------------------------|-------------------------------------|
| 1. Trip Blank present / cooler: | <input type="checkbox"/>            | <input type="checkbox"/> |                                     |
| 2. Trip Blank listed on COC:    | <input type="checkbox"/>            | <input type="checkbox"/> |                                     |
| 3. Samples preserved properly:  | <input checked="" type="checkbox"/> | <input type="checkbox"/> |                                     |
| 4. VOCs headspace free:         | <input type="checkbox"/>            | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

### Sample Integrity - Documentation

Y or N

- |  |                                     |                          |
|--|-------------------------------------|--------------------------|
| 1. Sample labels present on bottles:   | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Container labeling complete:        | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Sample container label / COC agree: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Sample Integrity - Condition

Y or N

- |                                  |                                     |                          |
|----------------------------------|-------------------------------------|--------------------------|
| 1. Sample recvd within HT:       | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. All containers accounted for: | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Condition of sample:          | Intact                              |                          |

### Sample Integrity - Instructions

Y or N N/A

- |   |                                     |                                     |                                     |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 1. Analysis requested is clear:           | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 2. Bottles received for unspecified tests | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |                                     |
| 3. Sufficient volume rec'd for analysis:  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |                                     |
| 4. Compositing instructions clear:        | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 5. Filtering instructions clear:          | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Comments

Accutest Laboratories  
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F: 508.481.7753

Marlborough, MA  
www.accutest.com

D10204: Chain of Custody

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## Metals Analysis

### QC Data Summaries

(Accutest Labs of New England, Inc.)

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Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D10204  
Account: ALMS - Accutest Mountain States  
Project: CORCCOGJ: Table 910-1

QC Batch ID: MP14764  
Matrix Type: SOLID

Methods: SW846 6010B  
Units: mg/kg

Prep Date: 02/03/10

Metal	RL	IDL	MDL	MB raw	final
Aluminum	20	2.7	3		
Antimony	2.0	.14	.16		
Arsenic	2.0	.1	.14		
Barium	20	.057	.07	0.040	<20
Beryllium	0.40	.015	.044		
Boron	10	.065	.071		
Cadmium	0.40	.024	.025		
Calcium	500	.76	2.4		
Chromium	1.0	.081	.11		
Cobalt	5.0	.025	.038		
Copper	2.5	.22	.23		
Gold	5.0	.11	.19		
Iron	10	.37	1.7		
Lead	2.0	.11	.22		
Magnesium	500	3.7	10		
Manganese	1.5	.012	.031		
Molybdenum	10	.022	.025		
Nickel	4.0	.024	.065		
Palladium	5.0	.22	.27		
Platinum	5.0	.93	.98		
Potassium	500	3.9	5.4		
Selenium	2.0	.19	.2		
Silicon	10	.89	.95		
Silver	0.50	.054	.099		
Sodium	500	6.1	9.2		
Strontium	1.0	.024	.026		
Thallium	2.0	.12	.18		
Tin	10	.065	.09		
Titanium	5.0	.074	.12		
Tungsten	10	.56	.72		
Vanadium	3.0	.068	.1		
Zinc	2.0	.074	.11		

Associated samples MP14764: D10204-2

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D10204  
Account: ALMS - Accutest Mountain States  
Project: CORCCOGJ: Table 910-1

QC Batch ID: MP14764  
Matrix Type: SOLID

Methods: SW846 6010B  
Units: mg/kg

Prep Date:

Metal

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D10204  
 Account: ALMS - Accutest Mountain States  
 Project: CORCCOGJ: Table 910-1

QC Batch ID: MP14764  
 Matrix Type: SOLID

Methods: SW846 6010B  
 Units: mg/kg

Prep Date: 02/03/10

Metal	D10286-2 Original MS	Spikelot MPICP	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	183	360	209	84.6 75-125
Beryllium				
Boron	anr			
Cadmium	anr			
Calcium				
Chromium	anr			
Cobalt				
Copper	anr			
Gold				
Iron				
Lead	anr			
Magnesium				
Manganese				
Molybdenum				
Nickel	anr			
Palladium				
Platinum				
Potassium				
Selenium	anr			
Silicon				
Silver	anr			
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Tungsten				
Vanadium				
Zinc	anr			

Associated samples MP14764: D10204-2

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D10204  
Account: ALMS - Accutest Mountain States  
Project: CORCCOGJ: Table 910-1

QC Batch ID: MP14764  
Matrix Type: SOLID

Methods: SW846 6010B  
Units: mg/kg

Prep Date:

Metal

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(N) Matrix Spike Rec. outside of QC limits  
(anr) Analyte not requested



MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D10204  
 Account: ALMS - Accutest Mountain States  
 Project: CORCCOGJ: Table 910-1

QC Batch ID: MP14764  
 Matrix Type: SOLID

Methods: SW846 6010B  
 Units: mg/kg

Prep Date: 02/03/10

Metal	D10286-2 Original	MSD	Spikelot MPICP	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	anr					
Barium	183	369	209	88.9	2.5	
Beryllium						
Boron	anr					
Cadmium	anr					
Calcium						
Chromium	anr					
Cobalt						
Copper	anr					
Gold						
Iron						
Lead	anr					
Magnesium						
Manganese						
Molybdenum						
Nickel	anr					
Palladium						
Platinum						
Potassium						
Selenium	anr					
Silicon						
Silver	anr					
Sodium						
Strontium						
Thallium						
Tin						
Titanium						
Tungsten						
Vanadium						
Zinc	anr					

Associated samples MP14764: D10204-2

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D10204  
Account: ALMS - Accutest Mountain States  
Project: CORCCOGJ: Table 910-1

QC Batch ID: MP14764  
Matrix Type: SOLID

Methods: SW846 6010B  
Units: mg/kg

Prep Date:

Metal

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(N) Matrix Spike Rec. outside of QC limits  
(anr) Analyte not requested

Login Number: D10204  
Account: ALMS - Accutest Mountain States  
Project: CORCCOGJ: Table 910-1

Prep Date: 02/03/10

Associated samples MP14764: D10204-2

## 7.1.3

Project: CORCCOGJ: Table 910-1

Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: D10204  
 Account: ALMS - Accutest Mountain States  
 Project: CORCCOGJ: Table 910-1

QC Batch ID: MP14764  
 Matrix Type: SOLID

Methods: SW846 6010B  
 Units: ug/l

Prep Date: 02/03/10

Metal	D10286-2 Original	SDL 1:5	%DIF	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	1770	1890	6.8	0-10
Beryllium				
Boron	anr			
Cadmium	anr			
Calcium				
Chromium	anr			
Cobalt				
Copper	anr			
Gold				
Iron				
Lead	anr			
Magnesium				
Manganese				
Molybdenum				
Nickel	anr			
Palladium				
Platinum				
Potassium				
Selenium	anr			
Silicon				
Silver	anr			
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Tungsten				
Vanadium				
Zinc	anr			

Associated samples MP14764: D10204-2

7.1.4  
7

SERIAL DILUTION RESULTS SUMMARY

Login Number: D10204  
Account: ALMS - Accutest Mountain States  
Project: CORCCOGJ: Table 910-1

QC Batch ID: MP14764  
Matrix Type: SOLID

Methods: SW846 6010B  
Units: ug/l

Prep Date:

Metal

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

7.1.4

7