



**STL**

**STL Denver**  
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Arvada, CO 80002

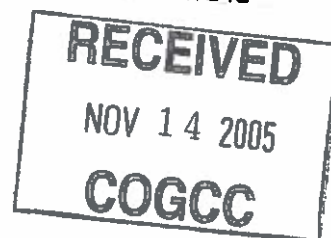
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## **ANALYTICAL REPORT**

Project: Carl Johnson Lease / Ward & Son

STL Denver Lot #: D5J240149



Randall Ferguson

Colorado Oil & Gas Conservation Commission  
1120 Lincoln St.  
Suite 801  
Denver, CO 80203

A handwritten signature in black ink, appearing to read "Patrick J. McEntee".

Patrick J. McEntee  
Project Manager  
Severn Trent Laboratories, Inc. / STL Denver

November 7, 2005

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## ***Standard Deliverables***

### Report Contents

### Total Number of Pages

#### ***Standard Deliverables***

*The Cover Letter and the Report Cover page are considered integral parts of this Standard Deliverable package. This report is incomplete unless all pages indicated in this Table of Contents are included.*



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## Case Narrative

The results included in this report have been reviewed for compliance with STL's Laboratory Quality Manual. The test results shown in this report meet all requirements of NELAC and any exceptions are noted below.

Dilution factors and footnotes have been provided to assist in the interpretation of the results. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interferences or analytes present at concentrations above the linear calibration curve, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

STL utilizes USEPA approved methods in all analytical work. The samples presented in this report were analyzed for the parameters listed on the analytical methods summary page in accordance with the methods indicated. A summary of quality control parameters is provided below.

This report shall not be reproduced except in full, without the written approval of the laboratory.

## Quality Control Summary for Lot D5J240149

### Sample Receiving

STL Denver received two solid samples under chain of custody on October 24, 2005

The samples were received un-chilled at an ambient temperature of 23.2°C.

All sample containers were received intact.

### Holding Times

All analyses were performed within the prescribed holding time.

### Sodium Absorption Ratio, Method S&PG SAR

No anomalies were encountered.

### General Chemistry Analysis

Conductance was detected in the Method Blank associated with prep batch 5299710 above the reporting limit of 2.0 umhos/cm at 6.8 umhos/cm. The Ottawa sand used for the Method Blank inherently contains detectable (although slight) levels of chloride and sulfate that is seen as specific conductance readings in the Method Blank. All associated positive sample results are qualified "J" on the analytical report.

No other anomalies were encountered.

## METHODS SUMMARY

D5J240149

<u>PARAMETER</u>	<u>ANALYTICAL METHOD</u>	<u>PREPARATION METHOD</u>
Percent Moisture	MCAWW 160.3 MOD	MCAWW 160.3 MOD
Sodium Adsorption Ratio (SAR)	S&PG SAR	MCAWW SAR
Soil and Waste pH	SW846 9045C	SW846 DI-LEACHA
Specific Conductance	SW846 9050A	

### References:

- MCAWW "Methods for Chemical Analysis of Water and Wastes",  
EPA-600/4-79-020, March 1983 and subsequent revisions.
- S&PG SOILS: AN INTRODUCTION TO SOILS AND PLANT GROWTH, 5FTH ED.,  
DONAHUE, MILLER AND SHICKLUNA, 1983
- SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical  
Methods", Third Edition, November 1986 and its updates.

## METHOD / ANALYST SUMMARY

D5J240149

<u>ANALYTICAL METHOD</u>	<u>ANALYST</u>	<u>ANALYST ID</u>
MCAWW 160.3 MOD	Duane Allee	001470
S&PG SAR	Janel Motichka	002862
SW846 9045C	Fougere M. Danielle	006481
SW846 9050A	Fougere M. Danielle	006481

### References:

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

S&PG SOILS: AN INTRODUCTION TO SOILS AND PLANT GROWTH, 5FTH ED.,  
DONAHUE, MILLER AND SHICKLUNA, 1983

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical  
Methods", Third Edition, November 1986 and its updates.

## SAMPLE SUMMARY

D5J240149

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
HNGLP	001	PIT/BATTERY AREA	10/20/05	
HNGLW	002	DISCHARGE AREA	10/20/05	

### 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.

## EXECUTIVE SUMMARY - Detection Highlights

D5J240149

<u>PARAMETER</u>	<u>RESULT</u>	<u>REPORTING LIMIT</u>	<u>UNITS</u>	<u>ANALYTICAL METHOD</u>
PIT/BATTERY AREA 10/20/05 001				
pH	8.4	0.10	No Units	SW846 9045C
Specific Conductance	180 J	2.0	umhos/cm	SW846 9050A
Percent Moisture	12	0.10	%	MCAWW 160.3 MOD
DISCHARGE AREA 10/20/05 002				
pH	9.0	0.10	No Units	SW846 9045C
Specific Conductance	160 J	2.0	umhos/cm	SW846 9050A
Percent Moisture	14	0.10	%	MCAWW 160.3 MOD

Colorado Oil&Gas Conservation Commission

Client Sample ID: PIT/BATTERY AREA

TOTAL Metals

Lot-Sample #...: D5J240149-001

Matrix.....: SOLID

Date Sampled...: 10/20/05

Date Received...: 10/24/05

<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>WORK</u> <u>ORDER #</u>
Prep Batch #...: 5299169						
Na Abs. Ratio	ND	4.3	No Units	S&PG SAR	10/26-10/29/05	HNGLP1AA
		Dilution Factor: 1		Analysis Time...: 07:12		



Colorado Oil&Gas Conservation Commission

Client Sample ID: PIT/BATTERY AREA

General Chemistry

Lot-Sample #....: D5J240149-001      Work Order #....: HNGLP      Matrix.....: SOLID  
 Date Sampled...: 10/20/05      Date Received...: 10/24/05

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
pH	8.4	0.10	No Units	SW846 9045C	10/26/05	5299702
		Dilution Factor: 1		Analysis Time...: 15:15		
Percent Moisture	12	0.10	%	MCAWW 160.3 MOD	10/31/05	5304525
		Dilution Factor: 1		Analysis Time...: 12:00		
Specific Conductance 180 J	2.0		umhos/cm	SW846 9050A	10/26/05	5299710
		Dilution Factor: 1		Analysis Time...: 09:15		

NOTE(S):

RL Reporting Limit

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

Colorado Oil&Gas Conservation Commision

Client Sample ID: DISCHARGE AREA

TOTAL Metals

Lot-Sample #....: D5J240149-002

Matrix.....: SOLID

Date Sampled....: 10/20/05

Date Received...: 10/24/05

PARAMETER	RESULT	REPORTING		METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
		LIMIT	UNITS			
Prep Batch #....: 5299169						
Na Abs. Ratio	ND	4.3	No Units	S&PG SAR	10/26-10/29/05	HNGLW1AA
		Dilution Factor: 1		Analysis Time...: 07:18		

Colorado Oil&Gas Conservation Commission

Client Sample ID: DISCHARGE AREA

General Chemistry

Lot-Sample #...: D5J240149-002      Work Order #...: HNGLW      Matrix.....: SOLID  
Date Sampled...: 10/20/05      Date Received...: 10/24/05

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
pH	9.0	0.10	No Units	SW846 9045C	10/26/05	5299702
		Dilution Factor: 1		Analysis Time...: 15:18		
Percent Moisture	14	0.10	%	MCAWW 160.3 MOD	10/31/05	5304525
		Dilution Factor: 1		Analysis Time...: 12:00		
Specific Conductance 160 J		2.0	umhos/cm	SW846 9050A	10/26/05	5299710
		Dilution Factor: 1		Analysis Time...: 09:15		

NOTE(S):

RL Reporting Limit

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

## QC DATA ASSOCIATION SUMMARY

D5J240149

Sample Preparation and Analysis Control Numbers

<u>SAMPLE#</u>	<u>MATRIX</u>	<u>ANALYTICAL METHOD</u>	<u>LEACH BATCH #</u>	<u>PREP BATCH #</u>	<u>MS RUN#</u>
001	SOLID	SW846 9045C		5299702	5304325
	SOLID	S&PG SAR		5299169	
	SOLID	SW846 9050A		5299710	5304310
	SOLID	MCAWW 160.3 MOD		5304525	5305248
002	SOLID	SW846 9045C		5299702	5304325
	SOLID	S&PG SAR		5299169	
	SOLID	SW846 9050A		5299710	5304310
	SOLID	MCAWW 160.3 MOD		5304525	5305248

# METHOD BLANK REPORT

## TOTAL Metals

Client Lot #...: D5J240149

Matrix.....: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	WORK ORDER #
MB Lot-Sample #: D5J260000-169 Prep Batch #...: 5299169						
Na Abs. Ratio	ND	4.3	No Units	S&PG SAR	10/26-10/29/05	HNLCP1AA
Dilution Factor: 1						
Analysis Time...: 06:47						

### NOTE(S) :

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

# METHOD BLANK REPORT

## General Chemistry

Client Lot #...: D5J240149

Matrix.....: SOLID

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Specific Conductance	6.8	2.0	umhos/cm	SW846 9050A	D5J260000-710 10/26/05	5299710
Work Order #: HN2CH1AA MB Lot-Sample #: D5J260000-710						
Dilution Factor: 1						
Analysis Time...: 09:15						

### NOTE(S):

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

# LABORATORY CONTROL SAMPLE EVALUATION REPORT

## General Chemistry

Lot-Sample #....: D5J240149

Matrix.....: SOLID

PARAMETER	PERCENT RECOVERY	RECOVERY LIMITS	RPD LIMITS	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #	
pH		WO#:HN2EP1AA-LCS/HN2EP1AC-LCSD LCS Lot-Sample#: D5J260000-702					
	100	(97 - 103)		SW846 9045C	10/26/05	5299702	
	100	(97 - 103)	0.14 (0-5.0)	SW846 9045C	10/26/05	5299702	
		Dilution Factor: 1		Analysis Time...: 14:23			
Specific Conductance		WO#:HN2CH1AC-LCS/HN2CH1AD-LCSD LCS Lot-Sample#: D5J260000-710					
	96	(90 - 110)		SW846 9050A	10/26/05	5299710	
	97	(90 - 110)	0.95 (0-20)	SW846 9050A	10/26/05	5299710	
		Dilution Factor: 1		Analysis Time...: 09:15			

### NOTE(S) :

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

## General Chemistry

Matrix.....: SOLID

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



## General Chemistry

Matrix.....: SOLID

\* Moisture.....: 18

Analysis Time.: 12:00

# SAMPLE DUPLICATE EVALUATION REPORT

## General Chemistry

Client Lot #....: D5J240149

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

Matrix.....: SOLID

Date Sampled....: 10/21/05

Date Received...: 10/24/05

% Moisture.....: 8.3

PARAM	RESULT	DUPLICATE RESULT	UNITS	RPD LIMIT	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
Specific Conductance	2200 J	2100	umhos/cm	1.4 (0-20)	SW846 9050A	SD Lot-Sample #: D5J240143-001 10/26/05	5299710
Dilution Factor: 1				Analysis Time...: 09:15			

### NOTE(S) :

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

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

# SAMPLE DUPLICATE EVALUATION REPORT

## General Chemistry

Client Lot #...: D5J240149

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

Matrix.....: SOLID

Date Sampled...: 10/20/05

Date Received...: 10/24/05

% Moisture.....: 12

PARAM	RESULT	DUPLICATE RESULT	UNITS	RPD	RPD LIMIT	METHOD	PREPARATION- ANALYSIS DATE	PREP BATCH #
pH	8.4	8.4	No Units	0.59	(0-5.0)	SD Lot-Sample #: D5J240149-001 SW846 9045C	10/26/05	5299702
				Dilution Factor: 1		Analysis Time...: 15:15		

23.2  
10/24/15  
Mica

SEVERN  
TRIDENT

STI

**STL Denver**  
4955 Yarrow Street  
Arvada, CO 80002

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Analysis (Attach list if  
more space is needed)

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Date	Time
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Special Instructions/  
Conditions of Receipt

STL Denver