



ADDENDUM TO:

**WILLIAMS PRODUCTION RMT COMPANY
NORTH LOGAN WASH
NOTICE OF COMPLETION REPORT FOR
REMEDATION #4963**

This Addendum is issued to modify, explain or clarify the original Notice of Completion Report for Remediation #4963.

As discussed in the original completion report, solidified cuttings from both the production and the reserve pits on the North Logan Wash (NLW) 21-17-797 (aka NLW 17-21D) well pad were combined and mixed with clean soil. As required by the Colorado Oil and Gas Conservation Commission (COGCC), the upper three (3) feet of pit backfill were reserved for native soil. Analytical results from the final backfill material are provided as an attachment to this addendum.

Reclamation procedures were performed as described in the Pit Closure Work Plan submitted to the COGCC as part of the Form 27 on December 12, 2009. Following removal of the solidified pit contents from the production and reserve pits on the well pad, the cuttings were mixed with clean fill. In order to satisfy the COGCC Rules 1000-Series requirements for interim reclamation of areas no longer in use, the clean fill was taken from the areas of the pad that are no longer required for production operations. As the fill was removed from the areas no longer in use, the locations were roughly graded to original contour. Upon completion of the mixing operations, the pits were backfilled with the mixed material to within three (3) feet of the final elevation. Even though the pits were identified as being located on non-crop land, the upper three (3) feet of the pits was backfilled with clean native soil. The backfilling of the pits was completed such that the soils were returned to their original relative positions. The pits were then graded to be level with the surrounding pad area.

As required by the COGCC Rules 1000-Series, those areas no longer needed for drilling activities were returned to original contour to best achieve erosion control and long-term stability. After all grading activities were completed, the disturbed areas no longer in use were re-seeded by using a seed mix prescribed by the landowner. The area was seeded as soon as was practicable to provide soil stability and serve as a nurse or cover crop for the desired species. The seed mixture was sterile to prevent the introduction of noxious weeds to the area.

The interim reclamation activities at the NLW 21-17-797 well pad are described above. The on-site activities were performed in conformance with the Pit Closure Work Plan submitted as part of the Form 27 for the site, as well as the COGCC Rules 1000-Series.

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11/02/10

Technical Report for

Williams Production RMT Company

Highlands_North_Logan_Wash

NLW 17-21D-797

Accutest Job Number: T62251

Sampling Date: 10/22/10

Report to:

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ATTN: Jane Souply

Total number of pages in report: 59



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.

A handwritten signature in black ink that reads 'Paul K Canevaro'.

Paul Canevaro
Laboratory Director

Client Service contact: Sylvia Garza 713-271-4700

Certifications: TX (T104704220-10-3) AR (88-0756) FL (E87628) KS (E-10366) LA (85695/04004)
OK (9103)

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Test results relate only to samples analyzed.

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Sample Summary

Williams Production RMT Company

Job No: T62251

Highlands_North_Logan_Wash
Project No: NLW 17-21D-797

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
T62251-1	10/22/10	08:50	10/23/10	SO	Soil	SO_NLW_PT6000_RECLAIM
T62251-1A	10/22/10	08:50	10/23/10	SO	Soil	SO_NLW_PT6000_RECLAIM
T62251-2	10/22/10	09:15	10/23/10	SO	Soil	SO_NLW_PT6001_RECLAIM
T62251-2A	10/22/10	09:15	10/23/10	SO	Soil	SO_NLW_PT6001_RECLAIM

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

Sample Results

Report of Analysis

Report of Analysis

Client Sample ID:	SO_NLW_PT6000_RECLAIM			Date Sampled:	10/22/10
Lab Sample ID:	T62251-1			Date Received:	10/23/10
Matrix:	SO - Soil			Percent Solids:	87.8
Method:	SW846 8260B				
Project:	Highlands_North_Logan_Wash				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Y0043483.D	1	10/26/10	FI	n/a	n/a	VY2665
Run #2							

	Initial Weight	Final Volume
Run #1	5.53 g	5.0 ml
Run #2		

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	4.1	0.72	ug/kg	
108-88-3	Toluene	ND	4.1	0.98	ug/kg	
100-41-4	Ethylbenzene	ND	4.1	0.93	ug/kg	
1330-20-7	Xylene (total)	ND	12	2.2	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	83%		70-121%
2037-26-5	Toluene-D8	87%		76-132%
460-00-4	4-Bromofluorobenzene	85%		73-165%
17060-07-0	1,2-Dichloroethane-D4	76%		57-122%

ND = Not detected MDL - Method Detection Limit
 RL = Reporting Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID: SO_NLW_PT6000_RECLAIM
Lab Sample ID: T62251-1
Matrix: SO - Soil
Method: SW846 8015
Project: Highlands_North_Logan_Wash

Date Sampled: 10/22/10
Date Received: 10/23/10
Percent Solids: 87.8

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BB0003004.D	1	10/25/10	AT	n/a	n/a	GBB163
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.87 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	5.5	0.33	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	98%		46-127%
98-08-8	aaa-Trifluorotoluene	106%		44-120%

ND = Not detected MDL - Method Detection Limit
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 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID:	SO_NLW_PT6000_RECLAIM			Date Sampled:	10/22/10
Lab Sample ID:	T62251-1			Date Received:	10/23/10
Matrix:	SO - Soil			Percent Solids:	87.8
Method:	SW846 8015 M SW846 3550B				
Project:	Highlands_North_Logan_Wash				

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JJ8120.D	2	10/28/10	HD	10/28/10	OP16502	GJF81
Run #2							

	Initial Weight	Final Volume
Run #1	30.1 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28)	15.1	7.6	6.2	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	76%		33-115%		

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: SO_NLW_PT6000_RECLAIM

Lab Sample ID: T62251-1

Date Sampled: 10/22/10

Matrix: SO - Soil

Date Received: 10/23/10

Percent Solids: 87.8

Project: Highlands_North_Logan_Wash

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic ^a	8.0	0.57	0.13	mg/kg	5	10/30/10	11/01/10 ANJ	SW846 6020A ³	SW846 3050B ⁶
Barium	235	13	0.038	mg/kg	1	10/27/10	10/29/10 NS	SW846 6010B ²	SW846 3050B ⁵
Cadmium	0.076 J	0.32	0.064	mg/kg	1	10/27/10	10/29/10 NS	SW846 6010B ²	SW846 3050B ⁵
Chromium	21.4	0.64	0.045	mg/kg	1	10/27/10	10/29/10 NS	SW846 6010B ²	SW846 3050B ⁵
Copper	24.5	1.6	0.083	mg/kg	1	10/27/10	10/29/10 NS	SW846 6010B ²	SW846 3050B ⁵
Lead	14.6	0.64	0.26	mg/kg	1	10/27/10	10/29/10 NS	SW846 6010B ²	SW846 3050B ⁵
Mercury	0.031	0.018	0.0072	mg/kg	1	10/25/10	10/25/10 CN	SW846 7471A ¹	SW846 7471A ⁴
Nickel	19.0	2.6	0.083	mg/kg	1	10/27/10	10/29/10 NS	SW846 6010B ²	SW846 3050B ⁵
Selenium	1.4	0.64	0.15	mg/kg	1	10/27/10	10/29/10 NS	SW846 6010B ²	SW846 3050B ⁵
Silver	0.083 J	0.64	0.051	mg/kg	1	10/27/10	10/29/10 NS	SW846 6010B ²	SW846 3050B ⁵
Zinc	83.8	1.3	0.26	mg/kg	1	10/27/10	10/29/10 NS	SW846 6010B ²	SW846 3050B ⁵

(1) Instrument QC Batch: MA5198

(2) Instrument QC Batch: MA5209

(3) Instrument QC Batch: N:MA25280

(4) Prep QC Batch: MP13163

(5) Prep QC Batch: MP13181

(6) Prep QC Batch: N:MP55412

(a) Analysis performed at Accutest Laboratories, Dayton, NJ.

RL = Reporting Limit

MDL = Method Detection Limit

U = Indicates a result < MDL

J = Indicates a result > = MDL but < RL

Report of Analysis

Client Sample ID:	SO_NLW_PT6000_RECLAIM	Date Sampled:	10/22/10
Lab Sample ID:	T62251-1	Date Received:	10/23/10
Matrix:	SO - Soil	Percent Solids:	87.8
Project:	Highlands_North_Logan_Wash		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	0.83 J	2.3	mg/kg	1	10/29/10 09:00	KD	SW846 3060/7196A
Chromium, Trivalent ^a	20.6	2.9	mg/kg	1	10/29/10 09:00	KD	SW846 6010/7196A M
Solids, Percent	87.8		%	1	10/26/10	LA	SM 2540 G
Specific Conductivity	2580	1.0	umhos/cm	1	10/26/10 14:00	MC	EPA 120.1
pH	8.01		su	1	10/26/10 14:18	MC	SW846 9045C

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SO_NLW_PT6000_RECLAIM	Date Sampled:	10/22/10
Lab Sample ID:	T62251-1A	Date Received:	10/23/10
Matrix:	SO - Soil	Percent Solids:	87.8
Project:	Highlands_North_Logan_Wash		

SAR Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	529	25	0.18	mg/l	5	10/26/10	10/29/10 NS	SW846 6010B ¹	LADNR 29B ²
Magnesium	239	25	0.039	mg/l	5	10/26/10	10/29/10 NS	SW846 6010B ¹	LADNR 29B ²
Sodium	804	25	0.67	mg/l	5	10/26/10	10/29/10 NS	SW846 6010B ¹	LADNR 29B ²

(1) Instrument QC Batch: MA5213
(2) Prep QC Batch: MP13155

RL = Reporting Limit
MDL = Method Detection Limit
U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

Report of Analysis

Client Sample ID:	SO_NLW_PT6000_RECLAIM	Date Sampled:	10/22/10
Lab Sample ID:	T62251-1A	Date Received:	10/23/10
Matrix:	SO - Soil	Percent Solids:	87.8
Project:	Highlands_North_Logan_Wash		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio ^a	7.29		ratio	1	10/29/10 18:19	NS	LADNR29B

(a) Calculated as: (Na meq/L) / sqrt [(Ca meq/L)+ (Mg meq/L)/2]

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SO_NLW_PT6001_RECLAIM	Date Sampled:	10/22/10
Lab Sample ID:	T62251-2	Date Received:	10/23/10
Matrix:	SO - Soil	Percent Solids:	89.4
Method:	SW846 8260B		
Project:	Highlands_North_Logan_Wash		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Y0043486.D	1	10/26/10	FI	n/a	n/a	VY2665
Run #2							

	Initial Weight	Final Volume
Run #1	5.37 g	5.0 ml
Run #2		

Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	4.2	0.73	ug/kg	
108-88-3	Toluene	ND	4.2	0.99	ug/kg	
100-41-4	Ethylbenzene	ND	4.2	0.94	ug/kg	
1330-20-7	Xylene (total)	ND	12	2.2	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	91%		70-121%
2037-26-5	Toluene-D8	103%		76-132%
460-00-4	4-Bromofluorobenzene	110%		73-165%
17060-07-0	1,2-Dichloroethane-D4	84%		57-122%

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID:	SO_NLW_PT6001_RECLAIM			Date Sampled:	10/22/10		
Lab Sample ID:	T62251-2			Date Received:	10/23/10		
Matrix:	SO - Soil			Percent Solids:	89.4		
Method:	SW846 8015						
Project:	Highlands_North_Logan_Wash						

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	BB0003005.D	1	10/25/10	AT	n/a	n/a	GBB163
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.40 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	5.8	0.35	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
460-00-4	4-Bromofluorobenzene	100%		46-127%
98-08-8	aaa-Trifluorotoluene	108%		44-120%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID: SO_NLW_PT6001_RECLAIM
Lab Sample ID: T62251-2
Matrix: SO - Soil
Method: SW846 8015 M SW846 3550B
Project: Highlands_North_Logan_Wash

Date Sampled: 10/22/10
Date Received: 10/23/10
Percent Solids: 89.4

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	JJ8122.D	2	10/28/10	HD	10/28/10	OP16502	GJF81
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28)	14.3	7.5	6.1	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
84-15-1	o-Terphenyl	74%		33-115%

ND = Not detected MDL - Method Detection Limit
RL = Reporting Limit
E = Indicates value exceeds calibration range

J = Indicates an estimated value
B = Indicates analyte found in associated method blank
N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID: SO_NLW_PT6001_RECLAIM

Lab Sample ID: T62251-2

Date Sampled: 10/22/10

Matrix: SO - Soil

Date Received: 10/23/10

Percent Solids: 89.4

Project: Highlands_North_Logan_Wash

Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analized By	Method	Prep Method
Arsenic ^a	9.5	0.55	0.12	mg/kg	5	10/30/10	11/01/10 ANJ	SW846 6020A ³	SW846 3050B ⁶
Barium	249	13	0.040	mg/kg	1	10/27/10	10/29/10 NS	SW846 6010B ²	SW846 3050B ⁵
Cadmium	0.067 U	0.33	0.067	mg/kg	1	10/27/10	10/29/10 NS	SW846 6010B ²	SW846 3050B ⁵
Chromium	21.9	0.67	0.047	mg/kg	1	10/27/10	10/29/10 NS	SW846 6010B ²	SW846 3050B ⁵
Copper	24.2	1.7	0.086	mg/kg	1	10/27/10	10/29/10 NS	SW846 6010B ²	SW846 3050B ⁵
Lead	15.0	0.67	0.27	mg/kg	1	10/27/10	10/29/10 NS	SW846 6010B ²	SW846 3050B ⁵
Mercury	0.029	0.018	0.0074	mg/kg	1	10/25/10	10/25/10 CN	SW846 7471A ¹	SW846 7471A ⁴
Nickel	18.5	2.7	0.086	mg/kg	1	10/27/10	10/29/10 NS	SW846 6010B ²	SW846 3050B ⁵
Selenium	1.4	0.67	0.16	mg/kg	1	10/27/10	10/29/10 NS	SW846 6010B ²	SW846 3050B ⁵
Silver	0.078 J	0.67	0.053	mg/kg	1	10/27/10	10/29/10 NS	SW846 6010B ²	SW846 3050B ⁵
Zinc	80.7	1.3	0.27	mg/kg	1	10/27/10	10/29/10 NS	SW846 6010B ²	SW846 3050B ⁵

(1) Instrument QC Batch: MA5198

(2) Instrument QC Batch: MA5209

(3) Instrument QC Batch: N:MA25280

(4) Prep QC Batch: MP13163

(5) Prep QC Batch: MP13181

(6) Prep QC Batch: N:MP55412

(a) Analysis performed at Accutest Laboratories, Dayton, NJ.

RL = Reporting Limit

MDL = Method Detection Limit

U = Indicates a result < MDL

J = Indicates a result > = MDL but < RL

Report of Analysis

Client Sample ID:	SO_NLW_PT6001_RECLAIM	Date Sampled:	10/22/10
Lab Sample ID:	T62251-2	Date Received:	10/23/10
Matrix:	SO - Soil	Percent Solids:	89.4
Project:	Highlands_North_Logan_Wash		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Chromium, Hexavalent	1.2 J	2.2	mg/kg	1	10/29/10 09:00	KD	SW846 3060/7196A
Chromium, Trivalent ^a	20.7	2.9	mg/kg	1	10/29/10 09:00	KD	SW846 6010/7196A M
Solids, Percent	89.4		%	1	10/26/10	LA	SM 2540 G
Specific Conductivity	6700	1.0	umhos/cm	1	10/26/10 14:00	MC	EPA 120.1
pH	7.90		su	1	10/26/10 14:18	MC	SW846 9045C

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

Client Sample ID:	SO_NLW_PT6001_RECLAIM	Date Sampled:	10/22/10
Lab Sample ID:	T62251-2A	Date Received:	10/23/10
Matrix:	SO - Soil	Percent Solids:	89.4
Project:	Highlands_North_Logan_Wash		

SAR Metals Analysis

Analyte	Result	RL	MDL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	469	25	0.18	mg/l	5	10/26/10	10/29/10 NS	SW846 6010B ¹	LADNR 29B ²
Magnesium	228	25	0.039	mg/l	5	10/26/10	10/29/10 NS	SW846 6010B ¹	LADNR 29B ²
Sodium	741	25	0.67	mg/l	5	10/26/10	10/29/10 NS	SW846 6010B ¹	LADNR 29B ²

(1) Instrument QC Batch: MA5213
(2) Prep QC Batch: MP13155

RL = Reporting Limit
MDL = Method Detection Limit
U = Indicates a result < MDL
J = Indicates a result > = MDL but < RL

Report of Analysis

Client Sample ID:	SO_NLW_PT6001_RECLAIM	Date Sampled:	10/22/10
Lab Sample ID:	T62251-2A	Date Received:	10/23/10
Matrix:	SO - Soil	Percent Solids:	89.4
Project:	Highlands_North_Logan_Wash		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio ^a	7.02		ratio	1	10/29/10 18:25	NS	LADNR29B

(a) Calculated as: (Na meq/L) / sqrt [(Ca meq/L)+ (Mg meq/L)/2]

RL = Reporting Limit

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody

SAMPLE INSPECTION FORM

Accutest Job Number: T62251 Client: Williams Production RMT Co. Date/Time Received: 10/23/10 1045

of Coolers Received: 1 Thermometer #: IR Gun 04 Temperature Adjustment Factor: 0

Cooler Temperatures (initial/adjusted): #1: 4.4°C #2: _____ #3: _____ #4: _____ #5: _____

#6: _____ #7: _____ #8: _____ #9: _____ #10: _____ #11: _____ #12: _____

Method of Delivery: FEDEX UPS Accutest Courier Greyhound Delivery Other

COOLER INFORMATION

- ☐ Custody seal missing or not intact
- ☐ Temperature criteria not met
- ☐ Wet ice received in cooler

CHAIN OF CUSTODY

- ☐ Chain of Custody not received
- ☐ Sample D/T unclear or missing
- ☐ Analyses unclear or missing
- ☐ COC not properly executed

SAMPLE INFORMATION

- ☐ Sample containers received broken
- ☐ VOC vials have headspace
- ☐ Sample labels missing or illegible
- ☐ ID on COC does not match label(s)
- ☐ D/T on COC does not match label(s)
- ☐ Sample/Bottles rcvd but no analysis on COC
- ☐ Sample listed on COC, but not received
- ☐ Bottles missing for requested analysis
- ☐ Insufficient volume for analysis
- ☐ Sample received improperly preserved

TRIP BLANK INFORMATION

- ☐ Trip Blank on COC but not received
- ☐ Trip Blank received but not on COC
- ☐ Trip Blank not intact
- ☐ Received Water Trip Blank
- ☐ Received Soil TB

Number of Encores? _____
Number of 5035 kds? _____
Number of lab-filtered metals? _____

Summary of Discrepancies:

SO-NLW-PT6000-Reclaim - NO D/T on 16 oz jar.

TECHNICIAN SIGNATURE/DATE: Doreen Haddock 10/23/10

INFORMATION AND SAMPLE LABELING VERIFIED BY: _____

CORRECTIVE ACTIONS

Client Representative Notified: _____

Date: _____

By Accutest Representative: _____

Via: Phone Email

Client Instructions: _____

3.1 3

PRESERVATIVES: 1: None 2: HCL 3: HNO3 4: H2SO4 5: NAOH 6: DI 7: MeOH 8: Other
LOCATION: 1: Walk-In #1 (Waters) 2: Walk-In #2 (Soils) VR: Volatile Fridge M: Metals SUB: Subcontract EF: Encore Freezer

T62251: Chain of Custody
Page 3 of 3

GC/MS Volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Page 1 of 1

Job Number: T62251

Account: WPRMTCOP Williams Production RMT Company

Project: Highlands_North_Logan_Wash

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VY2665-MB	Y0043482.D	1	10/26/10	FI	n/a	n/a	VY2665

The QC reported here applies to the following samples:

Method: SW846 8260B

T62251-1, T62251-2

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	4.0	0.70	ug/kg	
100-41-4	Ethylbenzene	ND	4.0	0.90	ug/kg	
108-88-3	Toluene	ND	4.0	0.95	ug/kg	
1330-20-7	Xylene (total)	ND	12	2.1	ug/kg	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	84% 70-121%
2037-26-5	Toluene-D8	88% 76-132%
460-00-4	4-Bromofluorobenzene	86% 73-165%
17060-07-0	1,2-Dichloroethane-D4	76% 57-122%

Blank Spike Summary

Job Number: T62251
Account: WPRMTCOP Williams Production RMT Company
Project: Highlands_North_Logan_Wash

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VY2665-BS	Y0043480.D	1	10/26/10	FI	n/a	n/a	VY2665

The QC reported here applies to the following samples: Method: SW846 8260B

T62251-1, T62251-2

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
71-43-2	Benzene	50	47.6	95	70-114
100-41-4	Ethylbenzene	50	45.4	91	60-119
108-88-3	Toluene	50	45.6	91	68-115
1330-20-7	Xylene (total)	150	138	92	61-115

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	87%	70-121%
2037-26-5	Toluene-D8	88%	76-132%
460-00-4	4-Bromofluorobenzene	86%	73-165%
17060-07-0	1,2-Dichloroethane-D4	80%	57-122%

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: T62251
Account: WPRMTCOP Williams Production RMT Company
Project: Highlands_North_Logan_Wash

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
T62251-1MS	Y0043484.D	1	10/26/10	FI	n/a	n/a	VY2665
T62251-1MSD	Y0043485.D	1	10/26/10	FI	n/a	n/a	VY2665
T62251-1	Y0043483.D	1	10/26/10	FI	n/a	n/a	VY2665

The QC reported here applies to the following samples:

Method: SW846 8260B

T62251-1, T62251-2

CAS No.	Compound	T62251-1 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND		54	50.1	93	48.7	91	3	70-114/38
100-41-4	Ethylbenzene	ND		54	55.9	103	52.8	99	6	60-119/40
108-88-3	Toluene	ND		54	70.2	130*	66.9	125*	5	68-115/38
1330-20-7	Xylene (total)	ND		162	164	101	155	97	6	61-115/39

CAS No.	Surrogate Recoveries	MS	MSD	T62251-1	Limits
1868-53-7	Dibromofluoromethane	81%	82%	83%	70-121%
2037-26-5	Toluene-D8	99%	99%	87%	76-132%
460-00-4	4-Bromofluorobenzene	111%	111%	85%	73-165%
17060-07-0	1,2-Dichloroethane-D4	74%	75%	76%	57-122%

GC Volatiles

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QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Page 1 of 1

Job Number: T62251

Account: WPRMTCOP Williams Production RMT Company

Project: Highlands_North_Logan_Wash

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GBB163-MB	BB0002984.DI		10/25/10	AT	n/a	n/a	GBB163

The QC reported here applies to the following samples:

Method: SW846 8015

T62251-1, T62251-2

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	5.0	0.30	mg/kg	

CAS No.	Surrogate Recoveries		Limits
460-00-4	4-Bromofluorobenzene	97%	46-127%
98-08-8	aaa-Trifluorotoluene	106%	44-120%

Blank Spike Summary

Page 1 of 1

Job Number: T62251

Account: WPRMTCOP Williams Production RMT Company

Project: Highlands_North_Logan_Wash

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GBB163-BS	BB0002981.DI		10/25/10	AT	n/a	n/a	GBB163

The QC reported here applies to the following samples:

Method: SW846 8015

T62251-1, T62251-2

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-GRO (C6-C10)	0.4	0.339	85	78-115

CAS No.	Surrogate Recoveries	BSP	Limits
460-00-4	4-Bromofluorobenzene	104%	46-127%
98-08-8	aaa-Trifluorotoluene	113%	44-120%

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: T62251
Account: WPRMTCOP Williams Production RMT Company
Project: Highlands_North_Logan_Wash

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
T62218-1MS	BB0002986.DI		10/25/10	AT	n/a	n/a	GBB163
T62218-1MSD	BB0002987.DI		10/25/10	AT	n/a	n/a	GBB163
T62218-1	BB0002985.DI		10/25/10	AT	n/a	n/a	GBB163

The QC reported here applies to the following samples: Method: SW846 8015

T62251-1, T62251-2

CAS No.	Compound	T62218-1 mg/kg	Q	Spike mg/kg	MS mg/kg	MS %	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-GRO (C6-C10)	3.39	J	21.9	25.1	99	25.6	102	2	78-115/14

CAS No.	Surrogate Recoveries	MS	MSD	T62218-1	Limits
460-00-4	4-Bromofluorobenzene	108%	111%	105%	46-127%
98-08-8	aaa-Trifluorotoluene	114%	115%	108%	44-120%

GC Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

Method Blank Summary

Page 1 of 1

Job Number: T62251

Account: WPRMTCOP Williams Production RMT Company

Project: Highlands_North_Logan_Wash

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP16502-MB	JJ8117.D	1	10/28/10	HD	10/28/10	OP16502	GJB81

The QC reported here applies to the following samples:

Method: SW846 8015 M

T62251-1, T62251-2

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH (C10-C28)	ND	3.3	2.7	mg/kg	

CAS No.	Surrogate Recoveries	Limits
84-15-1	o-Terphenyl	88% 33-115%

Blank Spike Summary

Page 1 of 1

Job Number: T62251
Account: WPRMTCOP Williams Production RMT Company
Project: Highlands_North_Logan_Wash

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP16502-BS	JJ8119.D	1	10/28/10	HD	10/28/10	OP16502	GJB81

The QC reported here applies to the following samples:

Method: SW846 8015 M

T62251-1, T62251-2

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH (C10-C28)	33.3	23.1	69	45-107

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	64%	33-115%

Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

Job Number: T62251

Account: WPRMTCOP Williams Production RMT Company

Project: Highlands_North_Logan_Wash

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP16502-MS	JJ8121.D	1	10/28/10	HD	10/28/10	OP16502	GJB81
OP16502-MSD	JJ8123.D	1	10/28/10	HD	10/28/10	OP16502	GJB81
T62250-1	JJ8118.D	5	10/28/10	HD	10/28/10	OP16502	GJF81

The QC reported here applies to the following samples:

Method: SW846 8015 M

T62251-1, T62251-2

CAS No.	Compound	T62250-1 mg/kg	Q	Spike mg/kg	MS mg/kg	MS %	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH (C10-C28)	229		36.5	258	79	296	183* a	14	45-107/34

CAS No.	Surrogate Recoveries	MS	MSD	T62250-1	Limits
84-15-1	o-Terphenyl	82%	82%	87%	33-115%

(a) Outside control limits due to high level in sample relative to spike amount.

Metals Analysis

QC Data Summaries

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: T62251
Account: WPRMTCOP - Williams Production RMT Company
Project: Highlands_North_Logan_Wash

QC Batch ID: MP13155
Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
Units: ug/l

Prep Date: 10/26/10

Metal	RL	IDL	MDL	MB raw	final
Aluminum	200	16	17		
Antimony	5.0	2.3	3		
Arsenic	5.0	1.8	2		
Barium	200	.14	2.7		
Beryllium	5.0	.11	.2		
Boron	100	1.1	2.1		
Cadmium	4.0	.25	.3		
Calcium	5000	5.4	35	0.77	<5000
Chromium	10	1.1	1.9		
Cobalt	50	.5	.8		
Copper	25	.58	5.9		
Iron	100	13	13		
Lead	3.0	1.6	1.7		
Magnesium	5000	6.7	7.8	0.92	<5000
Manganese	15	.2	7.6		
Molybdenum	10	.96	1.3		
Nickel	40	.95	3.2		
Potassium	5000	53	53		
Selenium	5.0	3.2	3.2		
Silver	10	.85	.8		
Sodium	5000	130	130	-8.6	<5000
Strontium	20	.17	.4		
Thallium	10	3.2	2.6		
Tin	20	1.8	2.9		
Titanium	20	.3	.3		
Vanadium	50	.6	.6		
Zinc	20	.49	4.1		

Associated samples MP13155: T62251-1A, T62251-2A

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: T62251
 Account: WPRMTCOP - Williams Production RMT Company
 Project: Highlands_North_Logan_Wash

QC Batch ID: MP13155
 Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
 Units: ug/l

Prep Date: 10/26/10

Metal	T62252-1A		RPD	QC Limits
	Original	DUP		
Calcium	463000	524000	11.1	0-20
Magnesium	175000	195000	9.7	0-20
Sodium	967000	1050000	8.2	0-20

Associated samples MP13155: T62251-1A, T62251-2A

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

SERIAL DILUTION RESULTS SUMMARY

Login Number: T62251
 Account: WPRMTCOP - Williams Production RMT Company
 Project: Highlands_North_Logan_Wash

QC Batch ID: MP13155
 Matrix Type: AQUEOUS

Methods: LADNR29B, SW846 6010B
 Units: ug/l

Prep Date: 10/26/10

Metal	T62252-1A			QC Limits
	Original	SDL 5:25	%DIF	
Calcium	463000	448000	4.6	0-10
Magnesium	175000	169000	4.6	0-10
Sodium	967000	910000	5.8	0-10

Associated samples MP13155: T62251-1A, T62251-2A

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

7.1.3

7

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: T62251
Account: WPRMTCOP - Williams Production RMT Company
Project: Highlands_North_Logan_Wash

QC Batch ID: MP13163
Matrix Type: SOLID

Methods: SW846 7471A
Units: mg/kg

Prep Date: 10/25/10

Metal	RL	IDL	MDL	MB	
				raw	final
Mercury	0.017	.00083	.0067	0.00043	<0.017

Associated samples MP13163: T62251-1, T62251-2

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

7.2.1

7

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: T62251
 Account: WPRMTCOP - Williams Production RMT Company
 Project: Highlands_North_Logan_Wash

QC Batch ID: MP13163
 Matrix Type: SOLID

Methods: SW846 7471A
 Units: mg/kg

Prep Date: 10/25/10 10/25/10

Metal	T62145-3 Original DUP		RPD	QC Limits	T62145-3 Original MS		Spikelot HGTXWS1	% Rec	QC Limits
Mercury	0.039	0.040	2.5	0-20	0.039	0.41	0.352	105.5	75-125

Associated samples MP13163: T62251-1, T62251-2

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: T62251
Account: WPRMTCOP - Williams Production RMT Company
Project: Highlands North Logan Wash

Methods: SW846 7471A
Units: mg/kg

10/25/10

Associated samples MP13163: T62251-1, T62251-2

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

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: T62251
 Account: WPRMTCOP - Williams Production RMT Company
 Project: Highlands_North_Logan_Wash

QC Batch ID: MP13163
 Matrix Type: SOLID

Methods: SW846 7471A
 Units: mg/kg

Prep Date: 10/25/10

Metal	LCS Result	Spikelot HGLCD054 % Rec	QC Limits
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Mercury	7.5	7.34	102.2	72-128
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Associated samples MP13163: T62251-1, T62251-2

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

BLANK RESULTS SUMMARY
Part 2 - Method Blanks

Login Number: T62251
Account: WPRMTCOP - Williams Production RMT Company
Project: Highlands_North_Logan_Wash

QC Batch ID: MP13181
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date: 10/27/10

Metal	RL	IDL	MDL	MB raw	final
Aluminum	10	.82	2.2		
Antimony	0.50	.11	.14		
Arsenic	0.50	.089	.1		
Barium	10	.007	.03	0.0095	<10
Beryllium	0.25	.0055	.01		
Boron	5.0	.054	.11		
Cadmium	0.25	.013	.05	-0.00050	<0.25
Calcium	250	.27	.86		
Chromium	0.50	.055	.035	-0.052	<0.50
Cobalt	2.5	.025	.09		
Copper	1.3	.029	.065	0.010	<1.3
Iron	5.0	.65	1.1		
Lead	0.50	.079	.2	-0.0035	<0.50
Magnesium	250	.34	.58		
Manganese	0.75	.01	.035		
Molybdenum	0.50	.048	.075		
Nickel	2.0	.048	.065	-0.0010	<2.0
Potassium	250	2.7	16		
Selenium	0.50	.16	.12	-0.0060	<0.50
Silver	0.50	.043	.04	-0.0085	<0.50
Sodium	250	6.5	13		
Strontium	1.0	.0085	.025		
Thallium	0.50	.16	.25		
Tin	1.0	.09	.12		
Titanium	1.0	.015	.045		
Vanadium	2.5	.03	.06		
Zinc	1.0	.025	.2	-0.14	<1.0

Associated samples MP13181: T62251-1, T62251-2

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: T62251
Account: WPRMTCOP - Williams Production RMT Company
Project: Highlands_North_Logan_Wash

QC Batch ID: MP13181
Matrix Type: SOLID

Methods: SW846 6010B
Units: mg/kg

Prep Date:

10/27/10

10/27/10

Metal	T62145-1 Original	DUP	RPD	QC Limits	T62145-1 Original	MS	Spikelot MPTW4	% Rec	QC Limits
Aluminum									
Antimony									
Arsenic	anr								
Barium	4820	2570	97.0*(a)	0-20	4820	2530	30.1	-16199.6b	80-120
Beryllium									
Boron									
Cadmium	0.0	0.55	200.0*(a)	0-20	0.0	27.5	30.1	91.3	80-120
Calcium									
Chromium	12.8	10.3	21.6*(a)	0-20	12.8	36.2	30.1	77.7N(c)	80-120
Cobalt									
Copper	17.4	14.6	17.5	0-20	17.4	37.5	30.1	66.7N(c)	80-120
Iron									
Lead	10.8	13.6	23.0*(a)	0-20	10.8	36.8	30.1	86.3	80-120
Magnesium									
Manganese									
Molybdenum	anr								
Nickel	7.6	6.8	11.1	0-20	7.6	32.5	30.1	82.7	80-120
Potassium	anr								
Selenium	0.73	2.1	96.8*(a)	0-20	0.73	27.5	30.1	88.9	80-120
Silver	0.15	0.13	14.3	0-20	0.15	28.5	30.1	94.1	80-120
Sodium									
Strontium									
Thallium									
Tin									
Titanium									
Vanadium									
Zinc	50.7	46.8	8.0	0-20	50.7	96.4	30.1	151.7N(c)	80-120

Associated samples MP13181: T62251-1, T62251-2

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

(a) High RPD due to possible sample nonhomogeneity.

(b) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

(c) Spike recovery indicates possible matrix interference.

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: T62251
 Account: WPRMTCOP - Williams Production RMT Company
 Project: Highlands_North_Logan_Wash

QC Batch ID: MP13181
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: mg/kg

Prep Date: 10/27/10

Metal	T62145-1 Original	MSD	Spikelot MPTW4	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	anr					
Barium	4820	4630	30	-9260.3a	58.7 (b)	20
Beryllium						
Boron						
Cadmium	0.0	27.5	30	91.6	0.0	20
Calcium						
Chromium	12.8	36.7	30	79.6N(c)	1.4	20
Cobalt						
Copper	17.4	44.2	30	89.3	16.4	20
Iron						
Lead	10.8	37.0	30	87.3	0.5	20
Magnesium						
Manganese						
Molybdenum	anr					
Nickel	7.6	34.5	30	89.6	6.0	20
Potassium	anr					
Selenium	0.73	27.9	30	90.5	1.4	20
Silver	0.15	27.8	30	92.1	2.5	20
Sodium						
Strontium						
Thallium						
Tin						
Titanium						
Vanadium						
Zinc	50.7	75.3	30	81.9	24.6 (b)	20

Associated samples MP13181: T62251-1, T62251-2

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

(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.

(b) High RPD due to possible sample nonhomogeneity or matrix interference.

(c) Spike recovery indicates possible matrix interference.

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: T62251

Account: WPRMTCOP - Williams Production RMT Company

Project: Highlands_North_Logan_Wash

QC Batch ID: MP13181

Methods: SW846 6010B

Matrix Type: SOLID

Units: mg/kg

Prep Date: 10/27/10

Metal	LCS Result	Spikelot MPLCD054	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	351	348	100.9	81-119
Beryllium				
Boron				
Cadmium	179	187	95.7	82-118
Calcium				
Chromium	88.5	89.5	98.9	79-121
Cobalt				
Copper	126	129	97.7	84-117
Iron				
Lead	157	172	91.3	79-120
Magnesium				
Manganese				
Molybdenum	anr			
Nickel	96.3	99	97.3	81-119
Potassium	anr			
Selenium	141	148	95.3	78-121
Silver	61.3	66	92.9	66-134
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Vanadium				
Zinc	375	394	95.2	80-119

Associated samples MP13181: T62251-1, T62251-2

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits

(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: T62251
 Account: WPRMTCOP - Williams Production RMT Company
 Project: Highlands_North_Logan_Wash

QC Batch ID: MP13181
 Matrix Type: SOLID

Methods: SW846 6010B
 Units: ug/l

Prep Date: 10/27/10

Metal	T62145-1 Original	SDL 1:5	%DIF	QC Limits
Aluminum				
Antimony				
Arsenic	anr			
Barium	64400	106000	7.3	0-10
Beryllium				
Boron				
Cadmium	0.00	0.00	NC	0-10
Calcium				
Chromium	171	187	9.4	0-10
Cobalt				
Copper	233	246	5.5	0-10
Iron				
Lead	145	167	15.4*(a)	0-10
Magnesium				
Manganese				
Molybdenum	anr			
Nickel	101	114	12.7*(a)	0-10
Potassium	anr			
Selenium	9.78	0.00	100.0(b)	0-10
Silver	2.04	0.00	100.0(b)	0-10
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Vanadium				
Zinc	678	770	13.5*(a)	0-10

Associated samples MP13181: T62251-1, T62251-2

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits

(anr) Analyte not requested

(a) Serial dilution indicates possible matrix interference.

(b) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

General Chemistry

QC Data Summaries

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: T62251
Account: WPRMTCOP - Williams Production RMT Company
Project: Highlands_North_Logan_Wash

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Chromium, Hexavalent	GN26388	2.0	<2.0	mg/kg	40	39.7	99.2	80-120%
Specific Conductivity	GN26286	1.0	<1.0	umhos/cm				

Associated Samples:

Batch GN26286: T62251-1, T62251-2

Batch GN26388: T62251-1, T62251-2

(*) Outside of QC limits

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DUPLICATE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: T62251
Account: WPRMTCOP - Williams Production RMT Company
Project: Highlands_North_Logan_Wash

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Chromium, Hexavalent	GN26388	T62230-2	mg/kg	1.5	<2.3	9.5	0-20%
Solids, Percent	GN26285	T62250-1	%	91	90.2	0.9	0-5%
Specific Conductivity	GN26286	T62145-1	umhos/cm	1380	1380	0.0	0-20%
pH	GN26289	T62145-1	su	9.92	9.92	0.0	0-20%

Associated Samples:

Batch GN26285: T62251-1, T62251-2

Batch GN26286: T62251-1, T62251-2

Batch GN26289: T62251-1, T62251-2

Batch GN26388: T62251-1, T62251-2

(*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY
GENERAL CHEMISTRY

Login Number: T62251
Account: WPRMTCOP - Williams Production RMT Company
Project: Highlands_North_Logan_Wash

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Chromium, Hexavalent	GN26388	T62230-2	mg/kg	1.5	45	45.0	96.6	75-125%

Associated Samples:

Batch GN26388: T62251-1, T62251-2

(*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

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8

Misc. Forms

Custody Documents and Other Forms

(Accutest New Jersey)

Includes the following where applicable:

- Chain of Custody

Metals Analysis

QC Data Summaries

(Accutest New Jersey)

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: T62251
Account: ALGC - Accutest Laboratories Gulf Coast, Inc.
Project: WPRMTCOP: Highlands_North_Logan_Wash

QC Batch ID: MP55412
Matrix Type: SOLID

Methods: SW846 6020A
Units: mg/kg

Prep Date: 10/30/10

Metal	RL	IDL	MDL	MB raw	final
Aluminum	25	.35	.52		
Antimony	0.25	.035	.022		
Arsenic	0.50	.045	.11	0.00010	<0.50
Barium	0.50	.028	.038		
Beryllium	0.25	.0075	.03		
Boron	2.5	.26	.25		
Cadmium	0.25	.029	.016		
Calcium	130	2.4	3.1		
Chromium	2.0	.029	.29		
Cobalt	0.25	.001	.016		
Copper	2.0	.054	.036		
Iron	25	.41	1.9		
Lead	0.25	.0095	.012		
Magnesium	130	.2	1.4		
Manganese	0.25	.008	.02		
Molybdenum	0.50	.097	.096		
Nickel	2.0	.021	.026		
Potassium	130	1.5	3.9		
Selenium	0.50	.029	.058		
Silver	1.0	.004	.022		
Sodium	130	.48	1.3		
Strontium	0.50	.004	.0082		
Thallium	0.25	.0075	.0051		
Tin	0.50	.035			
Titanium	0.50	.023	.27		
Uranium	0.50				
Vanadium	2.0	.23	.79		
Zinc	2.0	.36	.91		

Associated samples MP55412: T62251-1, T62251-2

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: T62251
 Account: ALGC - Accutest Laboratories Gulf Coast, Inc.
 Project: WPRMTCOP: Highlands_North_Logan_Wash

QC Batch ID: MP55412
 Matrix Type: SOLID

Methods: SW846 6020A
 Units: mg/kg

Prep Date: 10/30/10

Metal	T62145-1 Original MS	Spikelot MPIRS1	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	2.1	361	396	90.6
Barium				75-125
Beryllium				
Boron				
Cadmium				
Calcium				
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Potassium				
Selenium				
Silver				
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP55412: T62251-1, T62251-2

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: T62251
 Account: ALGC - Accutest Laboratories Gulf Coast, Inc.
 Project: WPRMTCOP: Highlands_North_Logan_Wash

QC Batch ID: MP55412
 Matrix Type: SOLID

Methods: SW846 6020A
 Units: mg/kg

Prep Date: 10/30/10

Metal	T62145-1 Original	MSD	Spikelot MPIRS1	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	2.1	364	401	90.2	0.8	20
Barium						
Beryllium						
Boron						
Cadmium						
Calcium						
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Magnesium						
Manganese						
Molybdenum						
Nickel						
Potassium						
Selenium						
Silver						
Sodium						
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc						

Associated samples MP55412: T62251-1, T62251-2

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

10.1.2 10

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: T62251
 Account: ALGC - Accutest Laboratories Gulf Coast, Inc.
 Project: WPRMTCOP: Highlands_North_Logan_Wash

QC Batch ID: MP55412
 Matrix Type: SOLID

Methods: SW846 6020A
 Units: mg/kg

Prep Date: 10/30/10

Metal	BSP Result	Spikelot MPIRS1	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	399	400	99.8	80-120
Barium				
Beryllium				
Boron				
Cadmium				
Calcium				
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Potassium				
Selenium				
Silver				
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP55412: T62251-1, T62251-2

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

10.1.3
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SERIAL DILUTION RESULTS SUMMARY

Login Number: T62251
 Account: ALGC - Accutest Laboratories Gulf Coast, Inc.
 Project: WPRMTCOP: Highlands_North_Logan_Wash

QC Batch ID: MP55412
 Matrix Type: SOLID

Methods: SW846 6020A
 Units: ug/l

Prep Date: 10/30/10

Metal	T62145-1	QC
Original	SDL 5:25 %DIF	Limits

Aluminum				
Antimony				
Arsenic	21.0	25.5	21.6 (a)	0-10
Barium				
Beryllium				
Boron				
Cadmium				
Calcium				
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Magnesium				
Manganese				
Molybdenum				
Nickel				
Potassium				
Selenium				
Silver				
Sodium				
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP55412: T62251-1, T62251-2

Results < IDL are shown as zero for calculation purposes

(*) Outside of QC limits

(anr) Analyte not requested

(a) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).