



**MWH**

**LABORATORIES**

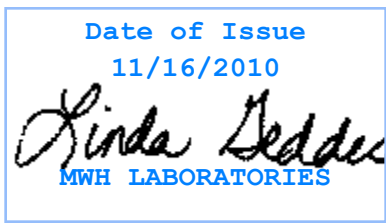
*A Division of MWH Americas, Inc.*

750 Royal Oak Dr., Suite 100  
Monrovia, California, 91016-3629  
Tel: 626 386 1100  
Fax: 626 386 1101  
1 800 566 LABS (1 800 566 5227)

**Laboratory Report**

for

Tronox LLC  
PO Box 55  
Henderson, NV 89009  
Attention: Susan Crowley  
Fax: 702-651-2310



LXG: Linda Geddes  
Project Manager



Report#: 342908  
Project: CWA-RCRA  
Group: Weekly  
Influent-Effluent long TAT

Laboratory certifies that the test results meet all **NELAC** requirements unless noted in the Comments section or the Case Narrative. Following the cover page are Hits Reports, Comments, QC Summary, QC Report and Regulatory Forms. This report shall not be reproduced except in full, without the written approval of the laboratory.

### Acknowledgement of Samples Received

**Tronox LLC**  
 PO Box 55  
 Henderson, NV 89009  
 Attn: Susan Crowley  
 Phone: 702-651-2234

Customer Code: TRONOX  
 Folder #: 342908  
 Project: CWA-RCRA  
 Sample Group: Weekly Influent-Effluent long TAT  
 Project Manager: Linda Geddes  
 Phone: (626) 386-1163

The following samples were received from you on **September 08, 2010**. They have been scheduled for the tests listed below each sample. If this information is incorrect, please contact your service representative. Thank you for using MWH Laboratories.

Sample #	Sample ID	Sample Date												
201009080396	Effluent	Sep 07, 2010 08:30												
	<table border="1"> <tr> <td>@ACOPEDD</td> <td>@R226EDD</td> <td>@R228EDD</td> </tr> <tr> <td>Apparent Color</td> <td>Chromium Total ICAP</td> <td>Hexavalent chromium(Dissolved)</td> </tr> <tr> <td>Iron Total ICAP</td> <td>PH (H3=past HT not compliant)</td> <td>Total Kjeldahl Nitrogen</td> </tr> <tr> <td>Total phosphorus as P</td> <td>Total Suspended Solids (TSS)</td> <td></td> </tr> </table>	@ACOPEDD	@R226EDD	@R228EDD	Apparent Color	Chromium Total ICAP	Hexavalent chromium(Dissolved)	Iron Total ICAP	PH (H3=past HT not compliant)	Total Kjeldahl Nitrogen	Total phosphorus as P	Total Suspended Solids (TSS)		
@ACOPEDD	@R226EDD	@R228EDD												
Apparent Color	Chromium Total ICAP	Hexavalent chromium(Dissolved)												
Iron Total ICAP	PH (H3=past HT not compliant)	Total Kjeldahl Nitrogen												
Total phosphorus as P	Total Suspended Solids (TSS)													
201009080397	Influent	Sep 07, 2010 09:00												
	<table border="1"> <tr> <td>Apparent Color</td> <td>Chromium Total ICAP</td> <td>Hexavalent chromium(Dissolved)</td> </tr> <tr> <td>Total Kjeldahl Nitrogen</td> <td>Total phosphorus as P</td> <td></td> </tr> </table>	Apparent Color	Chromium Total ICAP	Hexavalent chromium(Dissolved)	Total Kjeldahl Nitrogen	Total phosphorus as P								
Apparent Color	Chromium Total ICAP	Hexavalent chromium(Dissolved)												
Total Kjeldahl Nitrogen	Total phosphorus as P													

#### Test Description

- @ACOPEDD -- Gross Alpha by Co-precipitation (Sub)
- @R226EDD -- Radium 226 (Sub)
- @R228EDD -- Radium 228 (Sub)



342908

MWLABS USE ONLY:

750 Royal Oaks dr. Suite 100 Montrovia, Ca., 91016-3629

(626) 386-1100 (800) 566-5227

LOGIN COMMENTS:

SAMPLES CHECKED/LOGGED IN BY: SM / ABT

SAMPLE TEMP, RECEIPT AT LAB: 2

BLUE ICE: FROZEN  PARTIALLY FROZEN  THAWED  not ICC

TO BE COMPLETED BY SAMPLER:

COMPANY / PROJECT NAME TRONOX		PROJECT JOB # / P.O.# CWA-RCRA		IDENTIFIER, STATE ID#		MATRIX *		GRAB		COMP		REFER TO ATTACHED BOTTLE ORDER FOR ANALYSES <input type="checkbox"/> (check for yes)											
Sampler Signature: <u>Michele Brown</u>		Tronox LLC - Henderson Plant PO Box 55 Henderson, NV 89009		LOCATION		IDENTIFIER, STATE ID#		MATRIX *		GRAB		COMP		ANALYSES REQUIRED (mark an 'X' in all tests required for each sample line)									
TIME	DATE	LOCATION	IDENTIFIER, STATE ID#	MATRIX *	GRAB	COMP	CMV	ALPHA	FE, CR	T-P, TKN	Color	RA228EED/RA226EDD (2 Bits)	CR	pH	@ALPHA	TSS	SAMPLER COMMENTS						
8:30 AM	9/7/2010	EFFLUENT		RSW	X		X	X	X	X	X	X	X	X	X	X							
9:00	9/27/2010	INFLUENT		RSW	X		X																

\* MATRIX TYPES:

Reported by Volume:  
CFW = Chlor(am)inated Finished Water  
FW = Other Finished Water

RGW = Raw Ground Water  
RSW = Raw Surface Water

CWW = Chlorinated Waste Water  
WW = Other Waste Water  
SW = Storm Water

Reported by Weight:  
SO = Soil  
SL = Sludge

RELINQUISHED BY: <u>Michele Brown</u>	SIGNATURE	PRINT NAME	COMPANY/TITLE	DATE	TIME
RECEIVED BY: <u>[Signature]</u>		Michele Brown	Veolia Water NA for Tronox LLC - Henderson Plant	9/7/2010	12:00 PM
RELINQUISHED BY:					
RECEIVED BY: <u>[Signature]</u>		Salvador Martinez		9/8/10	1055

Linda Geddes Your MWWL Project Manager

BO #: 21223

Created By: LXG

Order Date: 07/14/2010

Bottle Orders

Ship By:  
 08/03/2010

**Ship Sample Kits to**

Veolia Water-Tronox LLC  
 Gate 1  
 560 West Lake Mead Pkwy  
 Henderson, NV 89015  
 Attn: Wendy Prescott  
 Phone:  
 Fax:

**Send Report to**

Tronox LLC  
 PO Box 55  
 Henderson, NV 89009  
 Attn: Susan Crowley  
 Phone: 702-651-2234  
 Fax: 702-651-2310

**Billing Address**

Tronox LLC  
 PO Box 55  
 Henderson, NV 89009  
 Attn: Susan Crowley  
 Phone: 702-651-2234  
 Fax: 702-651-2310

Group#  
 Date Sampled  
 Date Received

Client Code TRONOX  
 Project Code CWA-RCRA Bottle Orders  
 Group Name Weekly Influent-Effluent long TAT  
 PO# / Job#

**Sampler: please return  
 this paper with your samples**

# of Samples	Tests	Qteline#	Bottles - Qty for each sample, type & preservative if any	UN DOT #
2			1 sterile 125mL poly Sterile filter + syringe and instructions	
1	@ALPHA		1 500ml poly 2ml 18%HNO3+125ml poly/no pres	
1	@R226EDD		1 1L poly RA_226_4ml HNO3 18%	
1	@R228EDD		1 1L poly 4ml HNO3 (18%)	
2	Apparent Color		1 500ml amber glass no preservative	
1	Chromium Total ICAP		1 250ml acid rinsed 1ml HNO3 (18%)	
1	Chromium Total ICAP, Iron Total ICAP		1 250ml acid rinsed 1ml HNO3 (18%)	
2	Hexavalent Chromium (Dissolved)		1 125ml poly 1ml NH4SO4/NH4OH buffer	
1	PH (H3=past HT not compliant)		1 125ml poly no preservative	
2	Total Kjeldahl Nitrogen, Total phosphorus as P		1 250ml poly 0.5ml H2SO4 (50%)	
1	Total Suspended Solids (TSS)		1 500ml poly TDS - no preservative	

**Comments**

Weekly influent effluent - long TAT tests  
 Use sample ID of EFFLUENT and INFLUENT  
 Effluent gets - alpha, 226/228, color, cr, hex chrome, Fe, PH, TKN, T-P, TSS  
 Influent gets - color, chormium, hex chrome, TKN, T-P

Code Status Date Shipped Via Tracking # # of Coolers Prepared By

November 16, 2010

Ms. Susan Crowley  
Tronox  
PO Box 55  
Henderson, NV 89009

Subject: Case Narrative report 342908

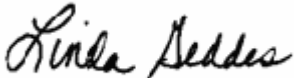
Sample receipt: The samples arrived at MWH Laboratories, Monrovia, CA on September 08, 2010 with proper chain of custody. All containers were received without any visible signs of tampering or breakage at proper temperature. Samples are identified on the acknowledgement, which is part of the report package, along with the chain of custody.

Case Narrative:  
For the MWH Laboratories data the following issues were observed:

Other Observations:

Gross Alpha, Radium226/228 was submitted by Pace Labs. Please see their case narrative for any issues.

Sincerely,



Linda Geddes  
Project Manager



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Tronox LLC  
Susan Crowley  
PO Box 55  
Henderson, NV 89009

**Laboratory Comments**

**Report: #342908**

---

**Client specific Comments**

I hereby certify that all laboratory analytical data was generated by a laboratory certified by the NDEP for each constituent and media presented herein.

Signature: \_\_\_\_\_

**Group Comments**

Analytical results for Alpha by Co-precip, Radium 226 and Radium 228 are submitted by Pace Analytical Services, Greensburg, PA



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Laboratory  
Hits Report: 342908

**Tronox LLC**  
Susan Crowley  
PO Box 55  
Henderson, NV 89009

Samples Received on:  
09/08/2010

Analyzed	Analyte	Sample ID	Result	Federal MCL	Units	MRL
		<b>201009080396</b>	<b><u>Effluent</u></b>			
09/09/2010	07:39	Apparent Color	15	15	ACU	3
09/21/2010	7:43	Chromium Total ICAP	0.012		mg/L	0.01
11/10/2010	19:56	Gross Alpha by Coprecipitation	18.7	15	pCi/L	2
09/21/2010	7:43	Iron Total ICAP	2.8	0.3	mg/L	0.02
09/09/2010	17:36	Kjeldahl Nitrogen	2.6		mg/L	0.2
09/08/2010	16:23	PH (H3=past HT not compliant)	6.7		Units	0.1
09/14/2010	13:47	Total phosphorus as P	0.31		mg/L	0.02
09/09/2010	11:42	Total Suspended Solids (TSS)	12		mg/L	10
		<b>201009080397</b>	<b><u>Influent</u></b>			
09/09/2010	07:40	Apparent Color	20	15	ACU	3
09/16/2010	02:52	Chromium Total ICAP	0.082		mg/L	0.01
09/08/2010	11:45	Hexavalent chromium(Dissolved)	70		ug/L	0.1
09/09/2010	17:37	Kjeldahl Nitrogen	7.4		mg/L	1
09/14/2010	13:49	Total phosphorus as P	0.076		mg/L	0.02



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Laboratory Data  
Report: 342908

**Tronox LLC**  
Susan Crowley  
PO Box 55  
Henderson, NV 89009

Samples Received on:  
09/08/2010

Prepared	Analyzed	QC Ref #	Method	Analyte	Result	Units	MDL	MRL	SQL	Dilution
<b>Effluent (201009080396)</b>						<b>Sampled on 09/07/2010 0830</b>				
<b>EPA 903.1 - Radium 226 (Sub)</b>										
09/22/2010	14:22		(EPA 903.1)	Radium 226	<1.09	pCi/L		1.1	0.0000	1
09/22/2010	14:22		(EPA 903.1)	Radium 226 Minimal Detectable	1.09	pCi/L			0.0000	1
09/22/2010	14:22		(EPA 903.1)	Radium 226 Two Sigma Error	0.503	pCi/L			0.0000	1
<b>EPA 904.0 - Radium 228 (Sub)</b>										
09/24/2010	11:50		(EPA 904.0)	Radium 228	<0.929	pCi/L		0.93	0.0000	1
09/24/2010	11:50		(EPA 904.0)	Radium 228 Minimum Detectable	0.929	pCi/L			0.0000	1
09/24/2010	11:50		(EPA 904.0)	Radium 228 Two Sigma Error	0.485	pCi/L			0.0000	1
<b>SM 7110C - Gross Alpha by Co-precipitation (Sub)</b>										
11/10/2010	19:56		(SM 7110C)	Alpha, Min Detectable Activity	2.03	pCi/L			0.0000	1
11/10/2010	19:56		(SM 7110C)	Alpha, Two Sigma Error	2.37	pCi/L			0.0000	1
11/10/2010	19:56		(SM 7110C)	Gross Alpha by Coprecipitation	18.7	pCi/L		2	0.0000	1
<b>EPA 351.2 - Total Kjeldahl Nitrogen</b>										
09/09/2010	17:36	568743	(EPA 351.2)	Kjeldahl Nitrogen	2.6	mg/L	0.044	0.2	0.044	1
<b>EPA 200.7 - ICP Metals</b>										
09/21/2010	7::43	569865	(EPA 200.7)	Chromium Total ICAP	0.012	mg/L	0.00044	0.01	0.0004	1
09/21/2010	7::43	569865	(EPA 200.7)	Iron Total ICAP	2.8	mg/L	0.0050	0.02	0.0050	1
<b>EPA 218.6 - Hexavalent chromium(Dissolved)</b>										
09/08/2010	11:36	568411	(EPA 218.6)	Hexavalent chromium(Dissolved)	ND	ug/L	0.033	0.05	0.033	1
<b>SM4500-PE/EPA 365.1 - Total phosphorus as P (T-P)</b>										
09/14/2010	13:47	569071	(SM4500-PE/EP A 365.1)	Total phosphorus as P	0.31	mg/L	0.0084	0.02	0.0084	1
<b>SM4500-HB - PH (H3=past HT not compliant)</b>										
09/08/2010	16:23	568377	(SM4500-HB)	PH (H3=past HT not compliant)	6.7	Units	0.10	0.1	0.100	1
<b>SM 2540D - Total Suspended Solids (TSS)</b>										
09/09/2010	11:42	568435	(SM 2540D)	Total Suspended Solids (TSS)	12	mg/L	4.4	10	4.4	1
<b>SM 2120B - Apparent Color</b>										

Rounding on totals after summation.  
(c) - indicates calculated results





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Laboratory Data  
Report: 342908

**Tronox LLC**  
Susan Crowley  
PO Box 55  
Henderson, NV 89009

Samples Received on:  
09/08/2010

Prepared	Analyzed	QC Ref #	Method	Analyte	Result	Units	MDL	MRL	SQL	Dilution	
	09/09/2010 07:39	568781	(SM 2120B)	Apparent Color	15	ACU	3	3	3.0	1	
<b>Influent (201009080397)</b>							<b>Sampled on 09/07/2010 0900</b>				
<b>EPA 351.2 - Total Kjeldahl Nitrogen</b>											
	09/09/2010 17:37	568743	(EPA 351.2)	Kjeldahl Nitrogen	7.4	mg/L	0.044	1	0.22	5	
<b>EPA 200.7 - ICP Metals</b>											
	09/16/2010 02:52	569195	(EPA 200.7)	Chromium Total ICAP	0.082	mg/L	0.00044	0.01	0.0004	1	
<b>EPA 218.6 - Hexavalent chromium(Dissolved)</b>											
	09/08/2010 11:45	568411	(EPA 218.6)	Hexavalent chromium(Dissolved)	70	ug/L	0.033	0.1	0.066	2	
<b>SM4500-PE/EPA 365.1 - Total phosphorus as P (T-P)</b>											
	09/14/2010 13:49	569071	(SM4500-PE/EP A 365.1)	Total phosphorus as P	0.076	mg/L	0.0084	0.02	0.0084	1	
<b>SM 2120B - Apparent Color</b>											
	09/09/2010 07:40	568781	(SM 2120B)	Apparent Color	20	ACU	3	3	3.0	1	



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1 800 566 LABS (1 800 566 5227)

Laboratory  
QC Summary: 342908

Tronox LLC

---

**QC Ref # 568377 - PH (H3=past HT not compliant)**

201009080396 Effluent

**Analysis Date: 09/08/2010**

Analyzed by: SAR

**QC Ref # 568411 - Hexavalent chromium(Dissolved)**

201009080396 Effluent

201009080397 Influent

**Analysis Date: 09/08/2010**

Analyzed by: TLH

Analyzed by: TLH

**QC Ref # 568435 - Total Suspended Solids (TSS)**

201009080396 Effluent

**Analysis Date: 09/09/2010**

Analyzed by: JRF

**QC Ref # 568743 - Total Kjeldahl Nitrogen**

201009080396 Effluent

201009080397 Influent

**Analysis Date: 09/09/2010**

Analyzed by: NJR

Analyzed by: NJR

**QC Ref # 568781 - Apparent Color**

201009080396 Effluent

201009080397 Influent

**Analysis Date: 09/09/2010**

Analyzed by: NEM

Analyzed by: NEM

**QC Ref # 569071 - Total phosphorus as P (T-P)**

201009080396 Effluent

201009080397 Influent

**Analysis Date: 09/14/2010**

Analyzed by: NJR

Analyzed by: NJR

**QC Ref # 569195 - ICP Metals**

201009080397 Influent

**Analysis Date: 09/16/2010**

Analyzed by: NINA

**QC Ref # 569865 - ICP Metals**

201009080396 Effluent

**Analysis Date: 09/21/2010**

Analyzed by: NINA



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Laboratory  
QC Report: 342908

Tronox LLC

QC Type	Analyte	Native	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPDLimit (%)	RPD%
<b>QC Ref# 568377 - PH (H3=past HT not compliant) by SM4500-HB</b>					<b>Analysis Date: 09/08/2010</b>				
DUP_201009080396	PH (H3=past HT not compliant)	6.7		6.74	Units		(0-20)	20	0.0
LCS1	PH (H3=past HT not compliant)		6.0	6.00	Units	100	(98-102)		
LCS2	PH (H3=past HT not compliant)		6.0	6.00	Units	100	(98-102)	20	0.0
<b>QC Ref# 568411 - Hexavalent chromium(Dissolved) by EPA 218.6</b>					<b>Analysis Date: 09/08/2010</b>				
LCS1	Hexavalent chromium(Dissolved)		2.0	2.05	ug/L	102	(90-110)		
LCS2	Hexavalent chromium(Dissolved)		2.0	2.00	ug/L	100	(90-110)		
MBLK	Hexavalent chromium(Dissolved)			<0.1	ug/L				
MRL_CHK	Hexavalent chromium(Dissolved)		0.05	0.0449	ug/L	90	(50-150)		
MS_201009070166	Hexavalent chromium(Dissolved)	4.3	2.0	6.4	ug/L	104	(90-110)		
MSD_201009070166	Hexavalent chromium(Dissolved)	4.3	2.0	6.34	ug/L	101	(90-110)	20	2.9
<b>QC Ref# 568435 - Total Suspended Solids (TSS) by SM 2540D</b>					<b>Analysis Date: 09/09/2010</b>				
DUP_201009080396	Total Suspended Solids (TSS)	12		13.0	mg/L		(0-10)	10	8.0
DUP_201009080566	Total Suspended Solids (TSS)	27		25.0	mg/L		(0-10)		
LCS1	Total Suspended Solids (TSS)		175	168	mg/L	96	(71-107)		
LCS2	Total Suspended Solids (TSS)		175	156	mg/L	89	(71-107)	20	7.4
MBLK	Total Suspended Solids (TSS)			<10	mg/L				
MRL_CHK	Total Suspended Solids (TSS)		10	9.00	mg/L	90	(50-150)		
<b>QC Ref# 568743 - Total Kjeldahl Nitrogen by EPA 351.2</b>					<b>Analysis Date: 09/09/2010</b>				
LCS1	Kjeldahl Nitrogen		4.0	4.09	mg/L	102	(90-110)		
LCS2	Kjeldahl Nitrogen		4.0	4.22	mg/L	106	(90-110)	20	3.1
MBLK	Kjeldahl Nitrogen			<0.1	mg/L				
MRL_CHK	Kjeldahl Nitrogen		0.2	0.240	mg/L	120	(50-150)		
MS_201009020299	Kjeldahl Nitrogen	0.38	4.0	4.3	mg/L	98	(90-110)		
MS2_201009020298	Kjeldahl Nitrogen	0.35	4.0	4.1	mg/L	94	(90-110)		
MSD_201009020299	Kjeldahl Nitrogen	0.38	4.0	4.2	mg/L	96	(90-110)	20	2.6
<b>QC Ref# 568781 - Apparent Color by SM 2120B</b>					<b>Analysis Date: 09/09/2010</b>				
DUP_201009080687	Apparent Color	ND		ND	ACU		(0-20)		
DUP1_201009080670	Apparent Color	ND		ND	ACU		(0-20)		
MBLK	Apparent Color			<3	ACU				
<b>QC Ref# 569071 - Total phosphorus as P (T-P) by SM4500-PE/EPA 365.1</b>					<b>Analysis Date: 09/14/2010</b>				
LCS1	Total phosphorus as P		0.4	0.367	mg/L	92	(90-110)		
LCS2	Total phosphorus as P		0.4	0.370	mg/L	93	(90-110)	20	0.81
MBLK	Total phosphorus as P			<0.02	mg/L				
MRL_CHK	Total phosphorus as P		0.02	0.0180	mg/L	90	(50-150)		

Spike recovery is already corrected for native results.

Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining.

Criteria for MS and Dup are advisory only, batch control is based on LCS. Criteria for duplicates

are advisory only, unless otherwise specified in the method.

(S) Indicates surrogate compound.

(I) Indicates internal standard compound.

RPD not calculated for LCS2 when different a concentration than LCS1 is used

RPD not calculated for Duplicates when the result is not five times the MRL (Minimum Reporting Level)



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Laboratory  
QC Report: 342908

Tronox LLC  
(continued)

QC Type	Analyte	Native	Spiked	Recovered	Units	Yield (%)	Limits (%)	RPDLimit (%)	RPD%
MS_201009090209	Total phosphorus as P	0.34	0.4	0.756	mg/L	105	(90-110)		
MS2_201009100263	Total phosphorus as P	ND	0.4	0.374	mg/L	91	(90-110)		
MSD_201009090209	Total phosphorus as P	0.34	0.4	0.760	mg/L	106	(90-110)	20	0.95

### QC Ref# 569195 - ICP Metals by EPA 200.7

Analysis Date: 09/16/2010

LCS1	Chromium Total ICAP		1.0	0.969	mg/L	97	(85-115)		
LCS2	Chromium Total ICAP		1.0	0.969	mg/L	97	(85-115)	20	0.0
MBLK	Chromium Total ICAP			<0.01	mg/L				
MRL_CHK	Chromium Total ICAP		0.01	0.00989	mg/L	99	(50-150)		
MS_201009140046	Chromium Total ICAP	ND	1.0	0.990	mg/L	99	(70-130)		
MSD_201009140046	Chromium Total ICAP	ND	1.0	0.975	mg/L	98	(70-130)	20	1.5
LCS1	Iron Total ICAP		5.0	4.88	mg/L	98	(85-115)		
LCS2	Iron Total ICAP		5.0	4.97	mg/L	99	(85-115)	20	1.8
MBLK	Iron Total ICAP			<0.02	mg/L				
MRL_CHK	Iron Total ICAP		0.02	0.0220	mg/L	110	(50-150)		
MS_201009140046	Iron Total ICAP	0.026	5.0	5.08	mg/L	101	(70-130)		
MSD_201009140046	Iron Total ICAP	0.026	5.0	5.04	mg/L	100	(70-130)	20	1

### QC Ref# 569865 - ICP Metals by EPA 200.7

Analysis Date: 09/21/2010

LCS1	Chromium Total ICAP		1.0	1.03	mg/L	103	(85-115)		
LCS2	Chromium Total ICAP		1.0	1.02	mg/L	102	(85-115)	20	0.98
MBLK	Chromium Total ICAP			<0.01	mg/L				
MRL_CHK	Chromium Total ICAP		0.01	0.0102	mg/L	102	(50-150)		
MS_201009090345	Chromium Total ICAP	ND	1.0	1.01	mg/L	101	(70-130)		
MS2_201009110102	Chromium Total ICAP	ND	1.0	0.989	mg/L	99	(70-130)		
MSD_201009090345	Chromium Total ICAP	ND	1.0	1.01	mg/L	101	(70-130)	20	0.0
MSD2_201009110102	Chromium Total ICAP	ND	1.0	1.00	mg/L	100	(70-130)	20	1.2
LCS1	Iron Total ICAP		5.0	5.26	mg/L	105	(85-115)		
LCS2	Iron Total ICAP		5.0	5.15	mg/L	103	(85-115)	20	2.1
MBLK	Iron Total ICAP			<0.02	mg/L				
MRL_CHK	Iron Total ICAP		0.02	0.0203	mg/L	102	(50-150)		
MS_201009090345	Iron Total ICAP	0.13	5.0	5.32	mg/L	104	(70-130)		
MS2_201009110102	Iron Total ICAP	0.062	5.0	5.16	mg/L	102	(70-130)		
MSD_201009090345	Iron Total ICAP	0.13	5.0	5.46	mg/L	107	(70-130)	20	2.8
MSD2_201009110102	Iron Total ICAP	0.062	5.0	5.14	mg/L	102	(70-130)	20	0.0

Spike recovery is already corrected for native results.

Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining.

Criteria for MS and Dup are advisory only, batch control is based on LCS. Criteria for duplicates

are advisory only, unless otherwise specified in the method.

(S) Indicates surrogate compound.

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(I) Indicates internal standard compound.

RPD not calculated for LCS2 when different a concentration than LCS1 is used

RPD not calculated for Duplicates when the result is not five times the MRL (Minimum Reporting Level)

November 12, 2010

Ms. Jaclyn L. Contreras  
MWH Americas, Inc.  
Royal Oaks Dr.  
Suite 100  
Monrovia, CA 910163629

RE: Project: PACE-PA 342908  
Pace Project No.: 3036360

Dear Ms. Contreras:

Enclosed are the analytical results for sample(s) received by the laboratory on October 28, 2010. The results relate only to the samples included in this report. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jacquelyn Collins

jacquelyn.collins@pacelabs.com  
Project Manager

Enclosures

cc: Mr. Aleksandar D. Tomovich, MWH Americas, Inc.

**REPORT OF LABORATORY ANALYSIS**

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## CERTIFICATIONS

Project: PACE-PA 342908  
Pace Project No.: 3036360

### Pennsylvania Certification IDs

1638 Roseytown Road Suites 2,3&4, Greensburg, PA 15601  
Alabama Certification #: 41590  
Arizona Certification #: AZ0734  
Arkansas Certification  
California/NELAC Certification #: 04222CA  
Colorado Certification  
Connecticut Certification #: PH 0694  
Delaware Certification  
Florida/NELAC Certification #: E87683  
Guam/PADEP Certification  
Hawaii/PADEP Certification  
Idaho Certification  
Illinois/PADEP Certification  
Indiana/PADEP Certification  
Iowa Certification #: 391  
Kansas/NELAC Certification #: E-10358  
Kentucky Certification #: 90133  
Louisiana/NELAC Certification #: LA080002  
Louisiana/NELAC Certification #: 4086  
Maine Certification #: PA0091  
Maryland Certification #: 308  
Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification  
Missouri Certification #: 235  
Montana Certification #: Cert 0082  
Nevada Certification  
New Hampshire/NELAC Certification #: 2976  
New Jersey/NELAC Certification #: PA 051  
New Mexico Certification  
New York/NELAC Certification #: 10888  
North Carolina Certification #: 42706  
Oregon/NELAC Certification #: PA200002  
Pennsylvania/NELAC Certification #: 65-00282  
Puerto Rico Certification #: PA01457  
South Dakota Certification  
Tennessee Certification #: TN2867  
Texas/NELAC Certification #: T104704188-09 TX  
Utah/NELAC Certification #: ANTE  
Virgin Island/PADEP Certification  
Virginia Certification #: 00112  
Washington Certification #: C1941  
West Virginia Certification #: 143  
Wisconsin/PADEP Certification  
Wyoming Certification #: 8TMS-Q

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: PACE-PA 342908  
Pace Project No.: 3036360

Lab ID	Sample ID	Matrix	Date Collected	Date Received
3036360001	201009080396	Drinking Water	09/07/10 08:30	10/28/10 10:00

### REPORT OF LABORATORY ANALYSIS

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**SAMPLE ANALYTE COUNT**

Project: PACE-PA 342908  
Pace Project No.: 3036360

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
3036360001	201009080396	SM 7110C	SJH	1	PASI-PA

**REPORT OF LABORATORY ANALYSIS**

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## PROJECT NARRATIVE

Project: PACE-PA 342908  
Pace Project No.: 3036360

---

**Method:** SM 7110C  
**Description:** 7110C Gross Alpha  
**Client:** MWH Laboratories  
**Date:** November 12, 2010

**General Information:**

1 sample was analyzed for SM 7110C. All samples were received in acceptable condition with any exceptions noted below.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: PACE-PA 342908

Pace Project No.: 3036360

---

**Sample: 201009080396**      **Lab ID: 3036360001**      Collected: 09/07/10 08:30      Received: 10/28/10 10:00      Matrix: Drinking Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
Gross Alpha	SM 7110C	<b>18.7 ± 2.37 (2.03)</b>	pCi/L	11/10/10 19:56	12587-46-1	

### QUALITY CONTROL DATA

Project: PACE-PA 342908  
Pace Project No.: 3036360

---

QC Batch:	RADC/6692	Analysis Method:	SM 7110C
QC Batch Method:	SM 7110C	Analysis Description:	7110C Gross Alpha
Associated Lab Samples:	3036360001		

---

METHOD BLANK:	237127	Matrix:	Water
Associated Lab Samples:	3036360001		

Parameter	Act ± Unc (MDC)	Units	Analyzed	Qualifiers
Gross Alpha	-0.350 ± 0.623 (1.53)	pCi/L	11/10/10 19:41	

## QUALIFIERS

Project: PACE-PA 342908

Pace Project No.: 3036360

### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty

(MDC) - Minimum Detectable Concentration

Pace Analytical is NELAP accredited. Contact your Pace PM for the current list of accredited analytes.

### LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

# Quality Control Sample Performance Assessment



Test: Gross Alpha  
 Analyst: SJH  
 Date: 11/11/2010  
 Worklist: 6692  
 Matrix (DW, W, F, Solid): DW

Method Blank Assessment	
MB concentration:	-0.350
MB Counting Uncertainty:	0.619
MB MDC:	1.527
MB Numerical Performance Indicator:	N/A
MB Status vs Numerical Indicator:	Pass

Laboratory Control Sample Assessment		
Count Date:	LCS	LSCD
Spike I.D.:	11/10/2010	11/10/2010
Spike Concentration (pCi/mL):	08-026	08-026
Volume Used (mL):	30.198	30.198
Aliquot Volume (L, g, F):	0.10	0.10
Target Conc. (pCi/L, g, F):	0.200	0.200
Uncertainty (Calculated):	15.089	15.089
Result (pCi/L, g, F):	0.947	0.947
LCS/LCSD Counting Uncertainty (pCi/L, g, F):	17.541	17.305
Numerical Performance Indicator:	1.890	1.893
Percent Recovery:	2.26	2.04
Status vs Numerical Indicator:	116.17%	114.61%
Status vs Recovery:	N/A	N/A
	Pass	Pass

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Duplicate Sample Assessment	
Sample I.D.:	LCS
Duplicate Sample I.D.:	LSCD
Sample Result (pCi/L, g, F):	17.541
Sample Duplicate Result (pCi/L, g, F):	1.890
Sample Duplicate Result Counting Uncertainty (pCi/L, g, F):	17.305
Are sample and/or duplicate results below MDC?	NO
Duplicate Numerical Performance Indicator:	0.173
Duplicate RPD:	1.35%
Duplicate Status vs Numerical Indicator:	N/A
Duplicate Status vs RPD:	Pass

Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the MDC.

Comments:

*See 11/11/10*

If all other QC criteria pass, this batch is acceptable. The matrix spike result indicates a possible bias for this sample only and may not be applicable to any other samples in this analytical batch.

Sample Matrix Spike Control Assessment	
Sample Collection Date:	10/4/2010
Sample I.D.:	3035917003
Sample MS I.D.:	3035917003MS
Sample MSD I.D.:	08-026
Spike I.D.:	30.198
MS/MSD Decay Corrected Spike Concentration (pCi/mL):	0.20
Spike Volume Used in MS (mL):	0.200
MS Aliquot (L, g, F):	30.198
MSD Aliquot (L, g, F):	1.894
MSD Target Conc. (pCi/L, g, F):	5.174
Spike uncertainty (calculated):	1.452
Sample Result:	120.467
Sample Result Counting Uncertainty (pCi/L, g, F):	10.668
Sample Matrix Spike Result:	15.257
Sample Matrix Spike Duplicate Result:	381.79%
MS Numerical Performance Indicator:	N/A
MSD Numerical Performance Indicator:	MS High****

Matrix Spike/Matrix Spike Duplicate Sample Assessment	
Sample I.D.:	Sample I.D.
Sample MS I.D.:	Sample MS I.D.
Sample MSD I.D.:	Sample MSD I.D.
Sample Result Counting Uncertainty (pCi/L, g, F):	Sample Matrix Spike Result:
Sample Duplicate Result Counting Uncertainty (pCi/L, g, F):	Sample Matrix Spike Duplicate Result:
Are sample and/or duplicate results below MDC?	Duplicate Numerical Performance Indicator:
Duplicate Numerical Performance Indicator:	MS/MSD Duplicate RPD:
Duplicate Status vs Numerical Indicator:	MS/MSD Duplicate Status vs Numerical Indicator:
Duplicate Status vs RPD:	MS/MSD Duplicate Status vs RPD:



MWH Laboratories  
 A Division of MWH Americas, Inc.  
 750 Royal Oaks Drive Suite 100  
 Monrovia, CA 91016-3629  
 Ph (626) 386-1100 Fax (626) 386-1095

Ship To

1638 Roseytown Road, Suite 2  
 PACE Analytical Services, Inc.  
 Greensburg, PA 15601

724-850-5600

Fax 724-850-5601

MWH Project # 342908 Report Due: 11/11/2010 Sub PO# 99-06685

JLS

SM 7110C

MACOPEDD

201009080396

Effluent

001

Client Sample ID for reference only

Analysis Requested

Gross Alpha by Co-precipitation

09/07/10 0830

Water

Sample

Date & Time Matrix

PWS Systemcode

PWSID

Reports: Jackie Contreras Sub-Contracting Administrator  
 EMAIL TO: mwhlabs-subcontractreports@mwhglobal.com  
 MWH Laboratories 750 Royal Oaks Dr. Ste. 100, Monrovia, CA 91016  
 Phone (626) 386-1165 Fax (626) 386-1122  
 Invoices to: MWH LABORATORIES  
 Accounts Payable PO BOX 6610, Broomfield, CO 80021

10 day lat

Provide in each Report the Specified State  
 Certification # & Exp Date for requested tests  
 + matrix.

Samples from the State of: NEVADA

Date 10/27/2010

Submittal Form & Purchase Order 99-06685

\*REPORTING REQUIREMENTS: Do Not Combine Report with any other samples submitted under different MWH project numbers!  
 Report & Invoice must have the MWH Project Number 342908 Sub PO# 99-06685 and Job # 1000014 3032360

Report all quality control data according to Method. Include dates analyzed. date extracted (if extracted) and Method reference on the report.  
 Results must have Complete data & QC with Approval Signature. See reverse side for List of Terms and Conditions

Relinquished by:

*Handwritten signature*

Received by:

Sample Control Date 10/27/10 Time 1530 MUST HAVE NOTIFICATION IF TEMP IS GREATER THAN 6 OR LESS THAN CELSIUS

Date 10/28/10 Time 1000 An Acknowledgement of Receipt is requested to attn: Christine Lewis



Sample Condition Upon Receipt

mlc

Client Name: MWH Project # 3036360

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace Other \_\_\_\_\_

Tracking #: N294 2872 3633

Optional  
Proj. Due Date:  
Proj. Name:

Custody Seal on Cooler/Box Present:  yes  no Seals intact:  yes  no

Packing Material:  Bubble Wrap  Bubble Bags  None  Other \_\_\_\_\_

Thermometer Used 3 5 Type of Ice: Wet Blue None  Samples on ice, cooling process has begun

Cooler Temperature N/A Biological Tissue is Frozen: Yes No

Date and Initials of person examining contents: mlc 10/28/10

Temp should be above freezing to 6°C

Comments:

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes date/time/ID/Analysis Matrix:	<u>WT</u>	
All containers needing preservation have been checked.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Initial when completed <u>mlc</u> Lot # of added preservative
Samples checked for dechlorination:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	16.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

Client Notification/ Resolution: \_\_\_\_\_ Field Data Required? Y / N

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

Project Manager Review: [Signature]

Date: 10/28/10

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e. out of hold, incorrect preservative, out of temp, incorrect containers)

September 27, 2010

Ms. Jaclyn L. Contreras  
MWH Americas, Inc.  
Royal Oaks Dr.  
Suite 100  
Monrovia, CA 910163629

RE: Project: PACE-PA 342908  
Pace Project No.: 3033740

Dear Ms. Contreras:

Enclosed are the analytical results for sample(s) received by the laboratory on September 10, 2010. The results relate only to the samples included in this report. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jacquelyn Collins

jacquelyn.collins@pacelabs.com  
Project Manager

Enclosures

cc: Mr. Aleksandar D. Tomovich, MWH Americas, Inc.

**REPORT OF LABORATORY ANALYSIS**

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## CERTIFICATIONS

Project: PACE-PA 342908  
Pace Project No.: 3033740

### Pennsylvania Certification IDs

1638 Roseytown Road Suites 2,3&4, Greensburg, PA 15601

Alabama Certification #: 41590  
Arizona Certification #: AZ0734  
Arkansas Certification  
California/NELAC Certification #: 04222CA  
Colorado Certification  
Connecticut Certification #: PH 0694  
Delaware Certification  
Florida/NELAC Certification #: E87683  
Guam/PADEP Certification  
Hawaii/PADEP Certification  
Idaho Certification  
Illinois/PADEP Certification  
Indiana/PADEP Certification  
Iowa Certification #: 391  
Kansas/NELAC Certification #: E-10358  
Kentucky Certification #: 90133  
Louisiana/NELAC Certification #: LA080002  
Louisiana/NELAC Certification #: 4086  
Maine Certification #: PA0091  
Maryland Certification #: 308  
Massachusetts Certification #: M-PA1457

Michigan/PADEP Certification  
Missouri Certification #: 235  
Montana Certification #: Cert 0082  
Nevada Certification  
New Hampshire/NELAC Certification #: 2976  
New Jersey/NELAC Certification #: PA 051  
New Mexico Certification  
New York/NELAC Certification #: 10888  
North Carolina Certification #: 42706  
Oregon/NELAC Certification #: PA200002  
Pennsylvania/NELAC Certification #: 65-00282  
Puerto Rico Certification #: PA01457  
South Dakota Certification  
Tennessee Certification #: TN2867  
Texas/NELAC Certification #: T104704188-09 TX  
Utah/NELAC Certification #: ANTE  
Virgin Island/PADEP Certification  
Virginia Certification #: 00112  
Washington Certification #: C1941  
West Virginia Certification #: 143  
Wisconsin/PADEP Certification  
Wyoming Certification #: 8TMS-Q

## REPORT OF LABORATORY ANALYSIS

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### SAMPLE SUMMARY

Project: PACE-PA 342908  
Pace Project No.: 3033740

Lab ID	Sample ID	Matrix	Date Collected	Date Received
3033740001	201009080396	Water	09/07/10 08:30	09/10/10 10:00

### REPORT OF LABORATORY ANALYSIS

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**SAMPLE ANALYTE COUNT**

Project: PACE-PA 342908  
Pace Project No.: 3033740

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
3033740001	201009080396	EPA 903.1	RMD	1	PASI-PA
		EPA 904.0	DJL	1	PASI-PA

**REPORT OF LABORATORY ANALYSIS**

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## PROJECT NARRATIVE

Project: PACE-PA 342908

Pace Project No.: 3033740

---

**Method:** EPA 903.1

**Description:** 903.1 Radium 226

**Client:** MWH Laboratories

**Date:** September 27, 2010

**General Information:**

1 sample was analyzed for EPA 903.1. All samples were received in acceptable condition with any exceptions noted below.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

## REPORT OF LABORATORY ANALYSIS

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## PROJECT NARRATIVE

Project: PACE-PA 342908  
Pace Project No.: 3033740

---

**Method:** EPA 904.0  
**Description:** 904.0 Radium 228  
**Client:** MWH Laboratories  
**Date:** September 27, 2010

**General Information:**

1 sample was analyzed for EPA 904.0. All samples were received in acceptable condition with any exceptions noted below.

**Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

**Method Blank:**

All analytes were below the report limit in the method blank with any exceptions noted below.

**Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

**Matrix Spikes:**

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

**Duplicate Sample:**

All duplicate sample results were within method acceptance criteria with any exceptions noted below.

**Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.

## REPORT OF LABORATORY ANALYSIS

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### ANALYTICAL RESULTS

Project: PACE-PA 342908

Pace Project No.: 3033740

**Sample: 201009080396**      **Lab ID: 3033740001**      Collected: 09/07/10 08:30      Received: 09/10/10 10:00      Matrix: Water  
PWS:      Site ID:      Sample Type:

Parameters	Method	Act ± Unc (MDC)	Units	Analyzed	CAS No.	Qual
Radium-226	EPA 903.1	<b>0.000 ± 0.503 (1.09)</b>	pCi/L	09/22/10 14:22	13982-63-3	
Radium-228	EPA 904.0	<b>0.713 ± 0.485 (0.929)</b>	pCi/L	09/24/10 11:50	15262-20-1	

### QUALITY CONTROL DATA

Project: PACE-PA 342908

Pace Project No.: 3033740

QC Batch: RADC/6128

Analysis Method: EPA 903.1

QC Batch Method: EPA 903.1

Analysis Description: 903.1 Radium-226

Associated Lab Samples: 3033740001

METHOD BLANK: 213913

Matrix: Water

Associated Lab Samples: 3033740001

Parameter	Act ± Unc (MDC)	Units	Analyzed	Qualifiers
Radium-226	0.118 ± 0.283 (0.546)	pCi/L	09/22/10 13:28	

### QUALITY CONTROL DATA

Project: PACE-PA 342908

Pace Project No.: 3033740

QC Batch: RADC/6131

Analysis Method: EPA 904.0

QC Batch Method: EPA 904.0

Analysis Description: 904.0 Radium 228

Associated Lab Samples: 3033740001

METHOD BLANK: 213916

Matrix: Water

Associated Lab Samples: 3033740001

Parameter	Act ± Unc (MDC)	Units	Analyzed	Qualifiers
Radium-228	0.733 ± 0.408 (0.723)	pCi/L	09/24/10 11:52	



## QUALIFIERS

Project: PACE-PA 342908  
Pace Project No.: 3033740

### DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Act - Activity

Unc - Uncertainty

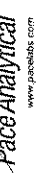
(MDC) - Minimum Detectable Concentration

Pace Analytical is NELAP accredited. Contact your Pace PM for the current list of accredited analytes.

### LABORATORIES

PASI-PA Pace Analytical Services - Greensburg

# Quality Control Sample Performance Assessment



Test: Ra-228  
 Analyst: DJL  
 Date: 9/8/2010  
 Worklist: 6131  
 Matrix: DW

Analyst Must Manually Enter All Fields Highlighted in Yellow.

**Method Blank Assessment**

MB Sample ID: 213916  
 MB Concentration: 0.733  
 MB Counting Uncertainty: 0.384  
 MB MDC: 0.723  
 MB Numerical Performance Indicator: 3.74  
 MB Status vs Numerical Indicator: N/A  
 MB Status vs. MDC: See Comment\*

**Laboratory Control Sample Assessment**

Count Date:	Y	LCS (Y or N)?
9/24/2010	9/24/2010	LCS06131
Spike I.D.:	09-037	09-037
Spike Concentration (pCi/mL):	79.444	79.444
Volume Used (mL):	0.10	0.10
Aliquot Volume (L, g, F):	0.800	0.800
Target Conc. (pCi/L, g, F):	9.930	9.930
Uncertainty (Calculated):	0.308	0.308
Result (pCi/L, g, F):	10.587	11.717
LCS/LCSD Counting Uncertainty (pCi/L, g, F):	0.947	0.989
Numerical Performance Indicator:	1.29	3.38
Percent Recovery:	108.61%	117.99%
Status vs Numerical Indicator:	N/A	N/A
Status vs Recovery:	Pass	Pass

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**Sample Matrix Spike Control Assessment**

Sample Collection Date: 9/10/2010  
 Sample I.D.: 3033737001  
 Sample MS I.D.: 3033737001MS  
 Spike I.D.: 09-037  
 MS/MSD Decay Corrected Spike Concentration (pCi/mL): 79.813  
 Spike Volume Used in MS (mL): 0.20  
 Spike Volume Used in MSD (mL): 0.800  
 MS Aliquot (L, g, F): 19.953  
 MS Target Conc. (pCi/L, g, F):  
 MSD Aliquot (L, g, F):  
 MSD Target Conc. (pCi/L, g, F):  
 Spike uncertainty (calculated): 0.619  
 Sample Result Counting Uncertainty (pCi/L, g, F): 1.043  
 Sample Matrix Spike Result: 0.419  
 Sample Matrix Spike Duplicate Result: 17.911  
 Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F): 1.138  
 Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F): -4.443  
 MS Numerical Performance Indicator: 84.54%  
 MS Percent Recovery: N/A  
 MSD Percent Recovery: Pass  
 MS Status vs Numerical Indicator: Pass  
 MS Status vs Recovery: Pass

**Matrix Spike/Matrix Spike Duplicate Sample Assessment**

Sample I.D.:  
 Sample MS I.D.:  
 Sample MSD I.D.:  
 Sample Matrix Spike Result:  
 Sample Matrix Spike Duplicate Result:  
 Matrix Spike Result Counting Uncertainty (pCi/L, g, F):  
 Sample Matrix Spike Duplicate Result:  
 Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):  
 Duplicate Numerical Performance Indicator:  
 MS/MSD Duplicate RPD:  
 MS/MSD Duplicate Status vs Numerical Indicator:  
 MS/MSD Duplicate Status vs RPD:

**Duplicate Sample Assessment**

Sample I.D.: LCS6131  
 Duplicate Sample I.D.: LCS06131  
 Sample Result (pCi/L, g, F): 10.587  
 Sample Result Counting Uncertainty (pCi/L, g, F): 0.947  
 Sample Duplicate Result (pCi/L, g, F): 11.717  
 Sample Duplicate Result Counting Uncertainty (pCi/L, g, F): 0.989  
 Are sample and/or duplicate results below MDC? NO  
 Duplicate Numerical Performance Indicator: -1.618  
 Duplicate RPD: 10.14%  
 Duplicate Status vs Numerical Indicator: N/A  
 Duplicate Status vs RPD: Pass

Enter Duplicate sample IDs if other than LCS/LCSD in the space below.

## Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the MDC.

Comments:

\*The method blank result is below the reporting limit for this analysis and is acceptable.

*Handwritten signature/initials*

# Quality Control Sample Performance Assessment



**Analyst Must Manually Enter All Fields Highlighted in Yellow.**

Test: Ra-226  
Analyst: RMD  
Date: 9/13/2010  
Worklist: 6128  
Matrix: DW

Method Blank Assessment	
MB Sample ID	213913
MB concentration:	0.118
M/B Counting Uncertainty:	0.282
MB MDC:	0.546
MB Numerical Performance Indicator:	5.67
MB Status vs Numerical Indicator:	N/A
MB Status vs. MDC:	Pass

Laboratory Control Sample Assessment		LCSD (Y or N)?
Count Date:	9/22/2010	LCSD6128
Spike I.D.:	09-036	9/22/2010
Spike Concentration (pCi/mL):	59.751	09-036
Volume Used (mL):	0.10	59.751
Aliquot Volume (L, g, F):	0.500	0.10
Target Conc. (pCi/L, g, F):	11.950	0.500
Uncertainty (Calculated):	0.287	11.950
Result (pCi/L, g, F):	11.173	0.287
LCSD/LCSD Counting Uncertainty (pCi/L, g, F):	1.766	12.837
Numerical Performance Indicator:	-0.85	1.702
Percent Recovery:	93.50%	1.01
Status vs Numerical Indicator:	N/A	107.42%
Status vs Recovery:	Pass	N/A
		Pass

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Sample Matrix Spike Control Assessment	
Sample Collection Date:	9/10/2010
Sample I.D.:	3033744001
Sample MS I.D.:	3033744001MS
Spike I.D.:	09-036
MS/MSD Decay Corrected Spike Concentration (pCi/mL):	59.752
Spike Volume Used in MS (mL):	0.20
Spike Volume Used in MSD (mL):	0.500
MS Aliquot (L, g, F):	23.901
MSD Aliquot (L, g, F):	0.574
MSD Target Conc. (pCi/L, g, F):	0.184
Spike uncertainty (calculated):	0.318
Sample Result:	18.535
Sample Result Counting Uncertainty (pCi/L, g, F):	2.073
Matrix Spike Result Counting Uncertainty (pCi/L, g, F):	-5.002
Sample Matrix Spike Duplicate Result:	76.78%
MS Numerical Performance Indicator:	N/A
MSD Numerical Performance Indicator:	Pass
MS Percent Recovery:	
MSD Percent Recovery:	
MS Status vs Numerical Indicator:	
MSD Status vs Numerical Indicator:	
MS Status vs Recovery:	
MSD Status vs Recovery:	

Matrix Spike/Matrix Spike Duplicate Sample Assessment	
Sample I.D.:	Sample I.D.:
Sample MS I.D.:	Sample MS I.D.:
Sample Matrix Spike Result:	Sample Matrix Spike Result:
Matrix Spike Result Counting Uncertainty (pCi/L, g, F):	Matrix Spike Result Counting Uncertainty (pCi/L, g, F):
Sample Matrix Spike Duplicate Result:	Sample Matrix Spike Duplicate Result:
Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):	Matrix Spike Duplicate Result Counting Uncertainty (pCi/L, g, F):
Duplicate Numerical Performance Indicator:	Duplicate Numerical Performance Indicator:
MS/MSD Duplicate RPD:	MS/MSD Duplicate RPD:
MS/MSD Duplicate Status vs Numerical Indicator:	MS/MSD Duplicate Status vs Numerical Indicator:
MS/MSD Duplicate Status vs RPD:	MS/MSD Duplicate Status vs RPD:

Duplicate Sample Assessment	
Sample I.D.:	LCSD6128
Duplicate Sample I.D.:	LCSD6128
Sample Result Counting Uncertainty (pCi/L, g, F):	11.173
Sample Duplicate Result Counting Uncertainty (pCi/L, g, F):	1.766
Sample Duplicate Result Counting Uncertainty (pCi/L, g, F):	12.837
Are sample and/or duplicate results below MDC?	NO
Duplicate Numerical Performance Indicator:	-1.330
Duplicate RPD:	13.86%
Duplicate Status vs Numerical Indicator:	N/A
Duplicate Status vs RPD:	Pass

# Evaluation of duplicate precision is not applicable if either the sample or duplicate results are below the MDC.

Comments:

*Handwritten signature/initials*



MWH Laboratories  
 A Division of MWH Americas, Inc.  
 750 Royal Oaks Drive Suite 100  
 Monrovia, CA 91016-3629  
 Ph (626) 386-1100 Fax (626) 386-1095

Ship To

1638 Roseytown Road, Suite 2  
 PACE Analytical Services, Inc.  
 Greensburg, PA 15601

724-850-5600

Fax 724-850-5601

MWH Project # 342908 Report Due: 10/01/2010 Sub PO# 99-06192

JLS

Use MWH Lab Samples to ID

EPA 903.1 ~~SR~~R228EDD 201009080396 Effluent 7001  
 EPA 904.0 ~~SR~~R228EDD 201009080396 Effluent

Analysis Requested  
 Radium 226 (Sub)  
 Radium 228 (Sub)

Sample

Date & Time Matrix  
 09/07/10 0830 Water  
 09/07/10 0830 Water

PWSID

PWS Systemcode

Date 9/9/2010

Submission Form & Purchase Order 99-06192

\*REPORTING REQUIREMENTS: Do Not Combine Report with any other samples submitted under different MWH project numbers!  
 Report & Invoice must have the MWH Project Number 342908 Sub PO# 99-06192 and Job # 1000014

3033740

Report all quality control data according to Method. Include dates analyzed. date extracted (if extracted) and Method reference on the report.  
 Results must have Complete data & QC with Approval Signature. See reverse side for List of Terms and Conditions

Reports: Jackie Contreras Sub-Contracting Administrator  
 EMAIL TO: mwhlabs-subcontractreports@mwhglobal.com  
 MWH Laboratories 750 Royal Oaks Dr. Ste. 100, Monrovia, CA 91016  
 Phone (626) 386-1165 Fax (626) 386-1122  
 Invoices to: MWH LABORATORIES  
 Accounts Payable PO BOX 6610, Broomfield, CO 80021

Provide in each Report the Specified State  
 Certification # & Exp Date for requested tests  
 + matrix.

Samples from the State of: NEVADA

Sample Control Date 4/9/10 Time 12:00 MUST HAVE NOTIFICATION IF TEMP IS GREATER THAN 6 OR LESS THAN CELSIUS

Relinquished by: *Jackie Contreras*

Date 9/10/10 Time 1000 An Acknowledgement of Receipt is requested to attn: Christine Lewis

Received by:

*ML*

**Sample Condition Upon Receipt**



Client Name: MWH Project # 3033740

Courier:  Fed Ex  UPS  USPS  Client  Commercial  Pace Other \_\_\_\_\_

Tracking #: N294 28718417

Optional:
Proj. Due Date:
Proj. Name:

Custody Seal on Cooler/Box Present:  yes  no Seals intact:  yes  no

Packing Material:  Bubble Wrap  Bubble Bags  None  Other \_\_\_\_\_

Thermometer Used 3 5 Type of Ice: Wet Blue None  Samples on ice, cooling process has begun

Cooler Temperature N/A  
Temp should be above freezing to 6°C

Biological Tissue is Frozen: Yes No

Date and Initials of person examining contents: <u>ML 9/10/10</u>
---

Comments:

Chain of Custody Present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name & Signature on COC:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time Analysis (<72hr):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Filtered volume received for Dissolved tests	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Sample Labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.
-Includes date/time/ID/Analysis Matrix: <u>WT</u>		
All containers needing preservation have been checked.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	13.
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
exceptions: VOA, coliform, TOC, O&G, WI-DRO (water)	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Initial when completed <u>ML</u> Lot # of added preservative
Samples checked for dechlorination:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Headspace in VOA Vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	15.
Trip Blank Present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	16.
Trip Blank Custody Seals Present	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank Lot # (if purchased):		

*PH22*

Client Notification/ Resolution: \_\_\_\_\_ Field Data Required? Y / N

Person Contacted: \_\_\_\_\_ Date/Time: \_\_\_\_\_

Comments/ Resolution: \_\_\_\_\_

Project Manager Review: *Jal Collins*

Date: 9/10/10

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office ( i.e. out of hold, incorrect preservative, out of temp, incorrect containers)