#### QA/QC Report

Client:	Battelle
Project:	JPL GW Mon 1Q10 / G486090

#### Service Request: P1000442 Date Analyzed: 02/05/10

Title:	Initial and Continuing Calibration Verification (ICV and CCV) Summary
Analyte:	Chromium, Hexavalent
Method:	7196A
Units:	mg/L (ppm)

Sample Name	True Value	Result	Percent Recovery	Acceptance Criteria
ICV	0.0579	0.0570	98	90-110
CCV1	0.0579	0.0580	100	90-110

Approved By: Kall Rya

\_\_\_\_\_Date: 2/5/10

CCV1A/120594

#### QA/QC Report

Client :	Battelle			Service	e Reques	t: P1000	442	
Project Name :	JPL GW Mon 1Q10			Date	Collecte	d: NA		
<b>Project Number :</b>	G486090			Date	Receive	d: NA		
Sample Matrix :	WATER			Date I	Extracted	d: NA		
-				Date .	Analyze	<b>d</b> : 02/05/	10	
		Laborat	tory Control Samp Inorganic Parame	eters				
Sample Name : Lab Code : Test Notes :	Laboratory Control Sample P1000442-LCS				Unit Basi	ts : mg/L is : NA	(ppm)	
		Duon	Amaluaia			Dougout	CAS Percent Recovery	Descrift
Analyte		Prep Method	Analysis Method	True Value	Result	Recovery	Limits	Notes
Chromium, Hexavale	ent	None	7196A	0.0400	0.0405	101	86-114	

Kau Rya Date: 3/5/10

Approved By \_\_\_\_

Report By:SAnderson

QA/QC Report

Client : Battelle JPL GW Mon 1Q10 Project Name : Project Number : G486090 Sample Matrix : WATER

Service Request: P1000442 **Date Collected :** 02/05/10 **Date Received :** 02/05/10 Date Extracted : NA **Date Analyzed :** 02/05/10

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name :	MW-17-4		Units :	mg/L (ppm)
Lab Code :	P1000442-001MS	P1000442-001DMS	Basis :	NA
Test Notes :				

	Prep	Analysis		Spike	Level	Sample	Spike	Result	Sp Rec	oike overy	CAS Acceptance	Relative	Result
Analyte	Method	Method	PQL	MS	DMS	Result	MS	DMS	MS	DMS	Limits	Difference	Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0477	0.0477	95	95	80-120	<]	

Approved By

Kau Rya Date: 2/5/10



#### CAS SR #P1000451

#### **Table of Contents**

Cover Letter	 	 1
Case Narrative		2
Acronym List	 	 3
Sample Cross-Reference	 	 4
Chain of Custody	 	 5
Internal Chain of Custody	 	6
Sample Acceptance Check Form	 	 7-8
Hexavalent Chromium Analytical Data	 	 9-14
Hexavalent Chromium Raw Data	 	 15-23

2655 Park Center Drive, Suite A I Simi Valley, CA 93065 I 805.526.7161

05.526.7161 | 805.526.7270 fax

Page

1 of 2?



February 11, 2010

Columbia

Analytical Services<sup>\*\*</sup>

David Conner Battelle 3990 Old Town Ave., Suite C-205 San Diego, CA 92110

#### **RE: JPL GW Mon 1Q10 / G486090**

Dear David:

Enclosed are the results of the samples submitted to our laboratory on February 8, 2010. For your reference, these analyses have been assigned our service request number P1000451.

All analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains 20 pages.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-09-TX; Minnesota Department of Health, Certificate No. 11495AA. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

**Columbia Analytical Services, Inc.** 

Judesta

Sue Anderson Project Manager



Client: Battelle JPL GW Mon 1Q10 / G486090 Project:

CAS Project No: P1000451

#### **CASE NARRATIVE**

The samples were received intact under chain of custody on February 8, 2010 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

#### Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for utilization of less than the complete report.

### Columbia Analytical Services, Inc.

#### <u>Acronyms</u>

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl tert -Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
$\mathbf{SM}$	Standard Methods for the Examination of Water and Wastewater, 19th Ed., 1995.
SW	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods , SW-846,
	Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TDS	Total Dissolved Solids
ТРН	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)
VOC	Volatile Organic Compound(s)

#### Qualifiers

U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
J	The result is an estimated concentration that is less than the MRL (PQL), but greater than or equal to the MDL.
В	Analyte detected in the method blank above MRL (PQL).
E	Estimated; result based on response which exceeded the instrument calibration range.
Ν	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
D	The reported result is from a dilution.
W.	

X See case narrative.

Client:BattelleProject:JPL GW Mon 1Q10/G486090

#### SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P1000451-001	MW-20-5	2/8/10	07:56
P1000451-002	MW-20-4	2/8/10	08:24
P1000451-003	MW-20-3	2/8/10	08:57
P1000451-004	MW-20-2	2/8/10	09:22
P1000451-005	MW-20-1	2/8/10	09:47
P1000451-006	EB-5-2/8/10	2/8/10	09:34



## Water & Soil - Chain of Custody Record & Analytical Service Request

Page \_\_\_\_ of \_\_\_\_

5

CAS Project No.

2655 Park Center Drive, Suite A Simi Valley, California 93065

Shini vaney, canorina e
 Phone (805) 526-7161
 Fax (805) 526-7270

Requested Turnaround Time in Business Days (Surcharges) please circle 1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day - Standard

Ia	x (003) J20	-1210		L				1								( A.		_				CAS	Conta	ct:	l	
Company Name & Address (Re	porting Inform	matior	i)	Project Na	me			1		-		Anaiy	SIS IVI	etnoa	ana	or A	nalyte	S				1				
BATTELLE				TOI C	Preservative Code												Preservative Key									
3990 OLD TOWN ,	AVE. C	-225		Droject Nu									0											0	No	ne
SAN DIEGO, CA	9211	0		G 48	G 486090					ntracted														2	HN	103 504
Project Manager DAVID CONNIC Phone Fax (6(6) 7 26 - 7311 Email Address for Result Repor	EIL ting	Sam	npler (	P.O. # / Bil 214319 ДТТы: С 505 К Сосл Print & Sign	ing Info B EMAL NG BUS	DH	4327 1	rganics GC/MS 260B □ Oxygenates □ TPH Ga	8015B □ 21B □ MTBE 8021B □	sel 8015B    (Subcontracted) sel Low Level 8015B    (Subco	□ 8015M (Subcontracted)	atile Organics GC/MS 270C □ (Subcontracted)	TT (-1196)											4 5 6 7	Na Zn As Otl	OH Acetate c Acid her
Client Sample ID	Laboratory ID Number	Da Colle	ate ected	Time Collected	Matr	ix	Number of Containers	Volatile O 624   8	TPH Gas BTEX 80	TPH Dies TPH Dies	TPH FC	Semi-Vola 625 🗆 8	r U											R	emark	s
MW-20-5		2/8	110	756	W		1						X											;		
Mw-70-4				824	1		1						X								Ι					
111-20-3				857			2						X											Ms/M.	s D	
MW-22-2				922			1		1				X													
11/1-22-1		$\square$		947			1						X								1					
		$\mathbf{T}$												·					1							
FB-5-218/10		+		934			1						X											EQUIP.	BLA	WK
and the second se													1.00													
							- -										1									
		1																								
		+		· ·				$\uparrow$	1																	
		-						1										$\top$	$\top$							
		1																								23844994-04740929204940600000
								+											+	-	+		$\neg$			
Report Tier Levels - please select Tier I - (Results/Default if not specific Tier II - (Results + QC) Relinquished by: (Signature)	ed)	Tier I Tier V	II - (Da - (clier	ta Validation	Package	a) 10% S	Surcharge	(Signat	MF ME ture)	RL requ	ired Ye L / J ro	es / No equire	o ed Yes /	No		EDD i Type:	required	d Yes /	No	Time:	C	Proje	ct Reo	juirements	(MRLs	, QAPP)
Relinquistion by: (Signature)	illor			Parsho	Time	35	Received by:	Signat	ture)	À	4	Ż	Ĝ	X	$\sum$		Da	nte: 08	10	rime: 3	5	Coole	ər / Bit	ank / Ice /	No Ice	********
Relinquished by: (Signature)				Date:	Time		Received by:	(Signat	ture)		<u> </u>		/		THE OWNER OF STREET		Da	ate:	-	Time:		Temp	eratur	e 5		°C

## Columbia Analytical Services, Inc. Chain of Custody Report

Client: Battelle Project: JPL GW Mon 1Q10/G486090

Service Request: P1000451

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1000451-001.01					
	7196A	0/0/10	1007		
		2/8/10	1207	SMU / SSTAPLES	
		2/8/10	1219	D.37 / SANDERSON	
		2/0/10	1525	1-577 SANDERSON	
P1000451-002.01					
	7196A		1007		
		2/8/10	1207	SMO/SSTAPLES	
		2/8/10	1220	In Lab / SANDERSON	
		2/8/10	1523	P-377 SANDERSON	
P1000451-003.01					
	7196A				
		2/8/10	1207	SMO / SSTAPLES	
		2/8/10	1220	In Lab / SANDERSON	
		2/8/10	1523	P-37 / SANDERSON	
P1000451-003.02					
		2/8/10	1207	SMO / SSTAPLES	
		2/8/10	1220	In Lab / SANDERSON	
		2/8/10	1523	P-37 / SANDERSON	
P1000451-004.01					
	7196A				
		2/8/10	1207	SMO / SSTAPLES	
		2/8/10	1220	In Lab / SANDERSON	
		2/8/10	1523	P-37 / SANDERSON	
P1000451-005.01					n an
	7196A				
		2/8/10	1207	SMO / SSTAPLES	
		2/8/10	1220	In Lab / SANDERSON	
		2/8/10	1523	P-37 / SANDERSON	
P1000451-006.01					
	7196A				
		2/8/10	1207	SMO / SSTAPLES	
		2/8/10	1220	In Lab / SANDERSON	
		2/8/10	1523	P-37 / SANDERSON	

## Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client:	Battelle		-		_	Work order:	P1000451			
Project:	JPL GW Mon	1Q10 / G486090								
Sample(	(s) received on:	02/08/10		-	Date opened:	02/08/10	by:	SSTAF	PLES	
<u>Note:</u> This:	form is used for <u>all</u>	samples received by CAS. T	The use of this for	m for custody seals	is strictly meant	to indicate presence/a	bsence and not as an	n indicatio	on of	
compliance	or nonconformity.	Thermal preservation and pl	I will only be eva	luated either at the	request of the cli	ent and/or as required	by the method/SOF	<sup>2</sup> . <u>Yes</u>	No	<u>N/A</u>
1	Were sample	containers properly r	narked with c	lient sample II	D?			X		
2	Container(s) s	upplied by CAS?						X		
3	Did sample co	ontainers arrive in go	od condition?	<b>)</b>				X		
4	Was a chain-o	of-custody provided?						$\mathbf{X}$		
5	Was the chair	-of-custody properly	completed?					X		
6	Did sample co	ontainer labels and/o	r tags agree w	rith custody pa	pers?			X		
7	Was sample v	olume received adequ	ate for analys	sis?				X		
8	Are samples w	vithin specified holdir	g times?					X		
1	Was proper te	mperature (thermal ]	preservation)	of cooler at rea	eipt adhered	to?		$\times$		
	C	Cooler Temperature		°C Blank	Temperature	3	°C			
10	Was a <b>trip bla</b>	ank received?								X
	Trip blank s	upplied by CAS:					_			
11	Were custody	seals on outside of co	oler/Box?						X	
	Location of	seal(s)?					_Sealing Lid?			X
	Were signat	ure and date included	?							X
	Were seals i	ntact?								X
	Were custody	seals on outside of sar	nple containe	r?					$\mathbf{X}$	
	Location of	seal(s)?					Sealing Lid?			$\mathbf{X}$
	Were signat	ure and date included	?							X
	Were seals i	ntact?								X
12	Do containers	have appropriate pre	servation, acc	cording to met	hod/SOP or C	Client specified in	nformation?	×		
	Is there a clie	nt indication that the	submitted san	nples are <b>pH</b> p	reserved?					X
	Were <b>VOA v</b>	ials checked for prese	nce/absence o	f air bubbles?						X
	Does the clier	nt/method/SOP requir	e that the anal	lyst check the	sample pH an	nd <u>if necessary</u> al	ter it?			X
13	Tubes:	Are the tubes cap	ped and intact	t?						X
		Do they contain	moisture?							X
14	Badges:	Are the badges p	roperly cappe	d and intact?						X
		Are dual bed bad	ges separated	and individua	lly capped an	d intact?				X
Lab !	Sample ID	Container	Required	Received	Adjusted	VOA Headspace	Receip	t / Pres	rvation	1
		Description	p⊞ *	pН	pН	(Presence/Absence)	6	Sommen	ts	
P10 <b>00451</b>	-001.01	125mL Plastic NP								
P100 <b>0451</b>	-002.01	125mL Plastic NP								
P1000451	-003.01	125mL Plastic NP								
P1000451	-003.02	125mL Plastic NP				·				
F1000451 P1000451	-004.01	125mL Plastic NP 125mL Plastic NP								

Explain any discrepancies: (include lab sample ID numbers):

\*Required pH: Phenols/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS, H2SO4 (pH<2); Metals, HNO3 (pH<2); CN (NaOH or NaOH/Asc Acid) (pH>12);

#### Columbia Analytical Services, Inc.

Sample Acceptance	Check	For	n
-------------------	-------	-----	---

Client: Battelle	L		Work order:	P1000451	
Project: JPL GW Mon 1Q10 / G486090					
Sample(s) received on: 02/08/10		Date opened:	02/08/10	by:	SSTAPLES

	Description	рН *	рН	pH	(Presence/Absence)	Receipt / Preservation Comments
P1000451-006.01 1	25mL Plastic NP					
anna gu ann an						
				urinny, kao mampika dia kaominina dia 400 metatra. Amin'ny fisiana amin'ny fisiana amin'ny fisiana amin'ny fis		
	anna an			n Carllan Managara ann an Anna		
	·					

Explain any discrepancies: (include lab sample ID numbers):

## **DIVIDER SHEET**

## ANALYTICAL DATA FOR

**Hexavalent Chromium** 

ANALYSIS

Analytical Report

Client :BattelleProject Name :JPL GW Mon 1Q10Project Number :G486090Sample Matrix :WATER

Service Request : P1000451 Date Collected : 02/08/10 Date Received : 02/08/10

Chromium, Hexavalent

Prep Method : None Analysis Method : 7196A Test Notes : Units : mg/L (ppm) Basis : NA

10

				Dilution	Date	Date/Time		Result
Sample Name	Lab Code	PQL	MDL	Factor	Extracted	Analyzed	Result	Notes
MW-20-5	P1000451-001	0.010	0.003	1	NA	02/08/10 13:30	ND	
MW-20-4	P1000451-002	0.010	0.003	1	NA	02/08/10 13:30	ND	
MW-20-3	P1000451-003	0.010	0.003	1	NA	02/08/10 13:30	ND	
MW-20-2	P1000451-004	0.010	0.003	1	NA	02/08/10 13:30	ND	
MW-20-1	P1000451-005	0.010	0.003	1	NA	02/08/10 13:30	ND	
EB-5-2/8/10	P1000451-006	0.010	0.003	1	NA	02/08/10 13:30	ND	
Method Blank	P1000451-MB	0.010	0.003	1	NA	02/08/10 13:30	ND	

Kau Rya Date: 2/8/10

Approved By

Report By:SAnderson

#### QA/QC Report

Client:BattelleProject:JPL GW Mon 1Q10 / G486090

Service Request: P1000451 Date Analyzed: 02/08/10

Title:	Initial and Continuing Calibration Blank (ICB and CCB) Summary
Analyte:	Chromium, Hexavalent
Method:	7196A
Units:	mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB CCB1	0.010 0.010	0.003 0.003	ND ND
CCB2	0.010	0.003	ND

Approved By: ICCBMDL/120594

Karer Rya

\_Date: 2/8/10

#### QA/QC Report

Client: Battelle Project: JPL GW Mon 1Q10 / G486090

#### Service Request: P1000451 Date Analyzed: 02/08/10

Title:	Initial and Continuing Calibration Verification (ICV and CCV) Summary
Analyte:	Chromium, Hexavalent
Method:	7196A
Units:	mg/L (ppm)

Sample Name	True Value	Result	Percent Recovery	Acceptance Criteria
ICV	0.0579	0.0560	97	90-110
CCV1 CCV2	0.0579	0.0550	95	90-110

Approved By:

CCV1A/120594

Karn Lya

QA/QC Report

Client :	Battelle			Service	e Reques	t: P1000	)451	
Project Name :	JPL GW Mon 1Q10			Date	Collected	d: NA		
Project Number :	G486090			Date	Receive	d: NA		
Sample Matrix :	WATER			Date 1	Extracte	d: NA		
				Date	Analyze	<b>d</b> : 02/08	10	
		Laborat	tory Control Samp Inorganic Paramo	ble Summary				
Sample Name : Lab Code : Test Notes :	Laboratory Control Sample P1000451-LCS				Unit Basi	ts: mg/L is: NA	(ppm)	
							CAS Percent Recovery	
Analyte		Prep Method	Analysis Method	True Value	Result	Percent Recovery	Acceptance Limits	Result Notes
Chromium, Hexaval	ent	None	7196A	0.0400	0.0403	101	86-114	

Kau Rya Date: 2/8/10 Approved By 13

#### QA/QC Report

Client : Battelle JPL GW Mon 1Q10 Project Name : Project Number: G486090 Sample Matrix : WATER

Service Request: P1000451 **Date Collected :** 02/08/10 **Date Received :** 02/08/10 Date Extracted : NA **Date Analyzed :** 02/08/10

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name :	MW-20-3		Units : mg/L (ppm)
Lab Code :	P1000451-003MS	P1000451-003DMS	Basis: NA
Test Notes :			

	Prep	Analysis		Spike	Level	Sample	Spike	Result	Sp Rec	oike overy	CAS	Relative	Result
Analyte	Method	Method	PQL	MS	DMS	Result	MS	DMS	MS	DMS	Limits	Difference	Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0445	0.0445	89	89	80-120	<1	

Approved By



#### CAS SR #P1000474

#### **Table of Contents**

Cover Letter	1
Case Narrative	2
Acronym List	3
Sample Cross-Reference	4
Chains of Custody	5-6
Internal Chain of Custody	7
Sample Acceptance Check Form	8-9
Hexavalent Chromium Analytical Data	10-15
Hexavalent Chromium Raw Data	16-24

Columbia Analytical Services<sup>\*</sup> 2655 F

2655 Park Center Drive, Suite A I Sir

Simi Valley, CA 93065

805.526.7161 | 805.526.7270 fax

#### www.caslab.com

Page 1 of 24

#### LABORATORY REPORT

February 16, 2010

David Conner Battelle 3990 Old Town Ave., Suite C-205 San Diego, CA 92110

#### **RE: JPL GW Mon 1Q10 / G486090**

Dear David:

Enclosed are the results of the samples submitted to our laboratory on February 9, 2010. For your reference, these analyses have been assigned our service request number P1000474.

All analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains 24 pages.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-09-TX; Minnesota Department of Health, Certificate No. 11495AA. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

**Columbia Analytical Services, Inc.** 

ne Judertin

Sue Anderson Project Manager



2655 Park Center Drive, Suite A I Simi Valley, CA 93065 I

Client: Battelle JPL GW Mon 1Q10 / G486090 Project:

CAS Project No:

www.caslah.com

#### **CASE NARRATIVE**

The samples were received intact under chain of custody on February 9, 2010 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

#### Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for utilization of less than the complete report.

#### **Columbia Analytical Services, Inc.**

#### <u>Acronyms</u>

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
Μ	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl tert -Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
թթե	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
$\mathbf{SM}$	Standard Methods for the Examination of Water and Wastewater, 19th Ed., 1995.
SW	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods , SW-846,
	Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)
VOC	Volatile Organic Compound(s)

#### Qualifiers

U The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDI	L.
--	----

- J The result is an estimated concentration that is less than the MRL (PQL), but greater than or equal to the MDL.
- B Analyte detected in the method blank above MRL (PQL).
- E Estimated; result based on response which exceeded the instrument calibration range.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.D The reported result is from a dilution.
- XSee case narrative.

#### SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P1000474-001	MW-4-3	2/9/10	08:10
P1000474-002	MW-4-2	2/9/10	08:32
P1000474-003	MW-4-1	2/9/10	09:02
P1000474-004	EB-6-2/9/10	2/9/10	08:50
P1000474-005	MW-3-4	2/9/10	10:35
P1000474-006	MW-3-3	2/9/10	11:17
P1000474-007	MW-3-2	2/9/10	11:37
P1000474-008	DUPE-3-1Q10	2/9/10	00:00



## Water & Soil - Chain of Custody Record & Analytical Service Request

Page \_\_\_\_ of \_\_\_\_

2655 Park Center Drive, Suite A Simi Valley, California 93065 Services ING. Phone (805) 526-7161 Eax (905) 526 7270

Requested Turnaround Time in Business Days (Surcharges) please circle 1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day - Standard

An Employee - Owned Company F	Phone (805) 5 ax (805) 526	26-7161 -7270		Requested Turnaround Time in Business Days (Surcharges) please circle1 Day (100%)2 Day (75%)3 Day (50%)4 Day (35%)5 Day (25%)10 Day - Standard								3AS Project No. $474$									
Company Name & Address (R	eporting Inforr	mation)	Project Na	me					Analy	/sis Me	ethod a	nd/or	Analy	tes			(	CAS Co	ontact:		
BATTELLE	5	,	TO								Prese	rvative	Code						Pres	ervative	Key
3990 OLD TOWN	AVE., (	205	JPL C	ow Mon	1 lup					0									0	Non	e
SAN DIEAN CA	· 001		Project Nu	mber			ted)												1	HCL	-
SAN SIEW, CA	9.211	0	G48	6090		□ s	ntrac												2	HNC H2S	04
Project Manager		· · · ·	P.O. # / Bill	ing,Informati	on	H Ga	(pe npco												4	NaO	н
DAVID CONN	ER		214319	/ BATT	ELLE	Ę	3 □ tracte	acted	ed)										5	Zn A	Acetate
Phone Fa	ax		ATTN: G	EMALD T	Ompicins	les 🗆	021E cont 15B (	ontre	C/MS	3									6	Asc	Acid
(610)776-7211			505 K	ING AVE	43201	/MS genat	BE 8 (Sub	Subc	bcon	Ň									7	Othe	er
Email Address for Result Repo	orting	Sampler	(Print & Sigr	1) 1)		anics GC B □ Oxy	15B   3   MT  8015B   Low Leve	8015M (	e Organic DC ⊟ (Su												
	1		т т			Org6 8260	IS 80 021E esel		olatile 827(	5											
Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile 624	TPH Ga BTEX 8 TPH Die TPH Die	TPH F	Semi-Vo 625 🗆	C.									F	Remarks	
Mw-4-3	Î	2/9/10	810	W	1					X											
MW-4-2	2		832	ŧ	1					X									LEVE	LI	WC
MW-4-1	R		902							X											
																	-				
EB-6-2/9/1=	, 4		850	l						$\times$									EQUI	! BLA	wk
																			-		
					5 																
								Ι													
								1	1	1	I	1	1	1 1	1	1	I	1			
Report Tier Levels - please select Tier I - (Results/Default if not speci Tier II - (Results + QC)	t ified)	Tier III - (D Tier V - (clie	ata Validation ent specified) _	Package) 10%	Surcharge		MRL req MDL / P0	uired Y QL / J	es / No require	o d Yes /	No	EDI Type	) requi	red Yes	/ No	-	-	Project	Requirement	s (MRLs, (	QAPP)
Relinquished by: (Signature)			Date:	Time:	Received by:	(Signatu	Ire)		7 *	~	)		1	Date?	5/10	ime: /	et.	2			
Relinquished by: (Signature)	The second secon	2	Date:	Times	Received by:	(Signate	e D	7	ÌC		E		Å	Pleal	6 1	\$4	5	Cooler	/ Blank / Ice /	No Ice	
Relinquished by: (Signature)		2	Date:	Time:	Received by:	(Signatu	ure)			D				Date:	- Ifi	me:		Temper	ature 2	f oc	2



#### 2655 Park Canter Drive Suite A

2655 Park Center Drive, Suite A Simi Valley, California 93065

Water & Soil - Chain of Custody Record & Analytical Service Request

Page \_\_\_\_ of \_\_\_\_

An Employee - Owned Company Ph	ione (805) 5 x (805) 526	26-7161 -7270		Requested 1 1 Day (100%	<b>Furnaround</b> ) 2 Day (75	<b>Time</b> %) 3	<b>in Bu</b> Day (	(50%)	s Day 4 Da	<b>/s (Sı</b> ıy (35	wrchar %) 5 [	<b>ges)</b> Day (2	please 25%)	<b>circle</b> 10 Day	e / - Sta	ndard			с 1	P/Pro	aject No. 2004	174
Company Name & Address (Re	norting Inform	nation)	Project N	ame		-				Anal	ysis M	etho	d and/o	or Ana	lytes				1	CA'S Co	ontact:	
RATTELLE	porting mon	nationy		unio								Dr	ocorvat	ive Co	do						Pres	ervative Kev
2990 OLD TOWN	N AVE.	C-205	JPL C	SW MON	10#0						0					Ι					0	None
SAU DIEGO (	1 921	10	Project N	umber				ted)													1	HCL
JAN JIEG, G			G48	6090		s		ntrac													2	HNO3 H2SO4
Project Manager			P.O. # / Bi	illing Informati	on	H Ga		ed) ubco	<b>F</b>												4	NaOH
DAVID CONNE	R		2143K	7 / BAT	TELLE			ntract	acteo	S ted)	(2										5	Zn Acetate
Phone Fax			ATTN: C	KING A	NE NE	sates [	8021	ubcor 015B	conti	GC/M	119										6	Asc Acid
(619)726-7311		-	COLUM	1BUS OF	1 43201	C/MS	TBE	□ (St vel 8	(Sub	hics ( Subco	U.											Other
Email Address for Result Repor	ting	Sampler	(Print & Sig	gn)		Janics G	015B 🗆 B 🗆 M	8015B	8015M	le Orgar ≀0C ⊟ (S	-			-								
Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	/olatile Orç 524 □ 826	FPH Gas 8 3TEX 8021	rPH Diese rPH Diese	TPH FC	Semi-Volati 325  821	Cr K											Remarks
MW-3-4	5	2/9/10	1035	W	1						$\checkmark$											
MW-3-3	6		1117								X											· ·
Mw-3-2	17		1137								X											
DUPE-3 - 1010	46										$\checkmark$										DUP	LI CATÉ
EB- //io								-			×								<del>).</del> (199		EWU	2 BLANKE
																<u> </u>						
• •																+						
Report Tier Levels - please select Fier I - (Results/Default if not specific Fier II - (Results + QC)	ed)	Tier III - (D Tier V - (clie	Pata Validation ent specified)	Package) 10%	Surcharge		MF	RL requ	ired Ye	equire	o ed Yes /	No	E	DD rec	quired Y	és / No	o /			Project	Requiremen	ts (MRLs, QAPP)
Relinquished by: (Signature)	· · ·		Date <u>1</u>	o Time: US	Received by	(Signat	ure			Y	$\sim$			1	Date:	7/0	, N Tim	fe:27	X		1	
Relinquished by: (Signature) Relinquished by: (Signature)	J		Date:	Time:	Received by Received by	(Signat ) (Signat	ure)	A	. G	5	6	1			Date:	9/0	, Tim Tim	ne <u>54</u> ne:	5	Cooler	/ Blank / Ice	

## Columbia Analytical Services, Inc. Chain of Custody Report

Client: Battelle Project: JPL GW Mon 1Q10/G486090 Service Request: P1000474

Bottle ID	Tests	Date	Time	Sample Location / User	<b>Disposed On</b>
P1000474-001.01					
	7196A	2/0/10	1.000		
		2/9/10	1600	SMU / SSTAPLES	
		2/9/10	1010	D 27 / SANDERSON	
		2/9/10	1/31	F-377 SANDERSON	
P1000474-002.01	-10.44				
	7196A	2/0/10	1600	SMO / SSTADIES	
		2/9/10	1610	SMO/SSIAPLES	
		2/9/10	1731	P-37 / SANDERSON	
		2/9/10	1751	1-577 SANDERSON	
P1000474-003.01	<b>5</b> 10()				
	7196A	2/0/10	1600	SMO / SSTADLES	
		2/9/10	1610	In Lab / SANDERSON	
		2/9/10	1731	P-37 / SANDERSON	
		2/7/10	1751		
P1000474-004.01					
	7196A	2/0/10	1600	SMO / SSTADLES	
		2/9/10	1610	SMO/SSIAPLES	
		2/9/10	1731	P-37 / SANDERSON	
	n e Migrich Bar Mandrid Britsch (B. 1999), an britsch i Mandrid Britsch (B. 1997), an an an an an an an an an a	2/ // 10	1751		
P1000474-005.01					
	7196A	0/0/10	1.000		
		2/9/10	1600	SMU/SSIAPLES	
		2/9/10	1010	III LAO / SANDERSON D 27 / SANDERSON	
		2/3/10	1731	F-577 SANDERSON	
P1000474-006.01					
	7196A	2/0/10	1(00		
		2/9/10	1600	SMO / SSTAPLES	
		2/9/10	1010	III Lao / SANDERSON D 27 / SANDERSON	
		2/ // 10	1751		
P1000474-007.01					
	7196A	0/0/10	1.600		
		2/9/10	1600	SMO / SSTAPLES	
		2/9/10	1610	In Lab / SANDERSON	
		2/9/10	1/31	P-3// SANDERSON	
P100 <b>0474-008.01</b>					
	7196A				
		2/9/10	1600	SMO / SSTAPLES	
		2/9/10	1610	In Lab / SANDERSON	
		2/9/10	1/31	r-j// SANDEKSUN	

## Columbia Analytical Services, Inc.

Client	Dattalla		Samp	le Acceptance	Check Forn	Work ordon	D1000474			
Project:	IPI GW Mon	1010/0486000	an a subsection of the second seco		8	work order:	P1000474	9-19-00 CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONTRACTOR CONT	NGHENE BRIGHT WEIGHT OF BRIDE BRIDT	-
Sample(	s) received on:	02/09/10			Date opened.	02/09/10	hv:	SSTAL	PLES	
Note: This	form is used for al	1 samples received by CAS.	The use of this	- form for custody	seals is strictly n	neant to indicate prese	- ence/absence and	not as an	indicatio	n of
compliance	or nonconformity	. Thermal preservation and	pH will only be	evaluated either a	t the request of t	he client and/or as rec	uired by the meth	od/SOP.		
-	-	-			-			Yes	No	N/A
1	Were sample	containers properly m	narked with cl	lient sample IE	<b>)</b> ?			$\times$	$\Box$	
2	Container(s) s	supplied by CAS?						$\times$	П	
3	Did sample c	ontainers arrive in goo	od condition?					×		
4	Was a chain-	of-custody provided?						X		
5	Was the chain	n-of-custody properly	completed?					X		
6	Did sample c	ontainer labels and/or	tags agree w	ith custody pap	pers?			X		
7	Was sample v	volume received adequ	ate for analys	sis?				X		
8	Are samples w	vithin specified holdin	g times?					$[\times]$		
9	Was proper to	emperature (thermal p	reservation)	of cooler at rec	eipt adhered	to?		×		
	C	ooler Temperature		°C Blank	Гemperature	4	°C	2-		
10	Was a trip bla	ank received?								X
	Trip blank s	upplied by CAS:					_			
11	Were custody	seals on outside of co	oler/Box?						X	
	Location of	seal(s)?					Sealing Lid?		$\Box$	$\times$
	Were signat	ure and date included?								$\times$
	Were seals i	ntact?								×
	Were custody	seals on outside of sar	nple containe	r?					X	
	Location of	seal(s)?					Sealing Lid?		$\Box$	X
	Were signat	ure and date included?								×
	Were seals i	ntact?								X
12	Do containers	have appropriate pres	ervation, acc	cording to metl	nod/SOP or C	Client specified in	formation?	×		
	Is there a clie	nt indication that the s	ubmitted sam	ples are <b>pH</b> p	reserved?					X
	Were <u>VOA v</u>	ials checked for preser	nce/absence o	f air bubbles?						X
	Does the clier	nt/method/SOP require	that the anal	yst check the s	ample pH and	d if necessary alt	er it?			X
13	Tubes:	Are the tubes capp	bed and intact	?						X
		Do they contain m	oisture?							X
14	Badges:	Are the badges pr	operly cappe	d and intact?						$\left  \times \right $
		Are dual bed badg	es separated a	and individuall	y capped and	l intact?				×
Lab S	Sample ID	Container	Required	Received	Adjusted	VOA Headspace	Receir	t / Pres	ervatio	1
		Description	pH *	pH	pH	(Presence/Absence)		Commer	its	
P1000474	-001.01	125mL Plastic NP								
P1000474	-002.01	125mL Plastic NP				· · · · · · · · · · · · · · · · · · ·				
P1000474	-003.01	125mL Plastic NP								
P1000474	-004.01	125mL Plastic NP								
P1000474	-005.01	125mL Plastic NP								
1000474	-000.01	125IIIL Flasue NP								

Explain any discrepancies: (include lab sample ID numbers):

\*Required pH: Phenols/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS, H2SO4 (pH<2); Metals, HNO3 (pH<2); CN (NaOH or NaOH/Asc Acid) (pH>12); Diss. Sulfide, NaOH (pH>2); T. Sulfide, NaOH/ZnAc.(pH>12) P1000474, Batterle\_JPL OW Mon 1Q10\_G886090-Phge 1 of 2 RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

#### Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client: Battelle

Project: JPL GW Mon 1Q10 / G486090

Sample(s) received on: 02/09/10

Date opened: 02/09/10

Work order:

by: SSTAPLES

P1000474

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1000474-007.01	125mL Plastic NP					
P1000474-008.01	125mL Plastic NP					
стоту техничну ценницији у цалина блазина и цег матори за кола и сили та и пред станати си и транични одини на П			n maanaa maa waxaa w	NIL INC. IN ALMONG AND		
					********	
	*******	n 1964 waar yn 1969 ta fel fan de staar of skrige yn 1963 of 1965 waar ta staar ta staar ta staar ta staar ta s				
		nyanakén kenerakyan kenerakan kenerakan kenerakan kenerakan kenerakan kenerakan kenerakan kenerakan kenerakan k				
						· · · · · · · · · · · · · · · · · · ·
************************************	NY PERIMA DIALAMANA ANA DIALAMA ANA DIALAMA ANA DIALAMA DIALAMA DIALAMA DIALAMA DIALAMA DIALAMA DIALAMA DIALAM		1241.5420.1647.77.002.0101.0101.0101.0101.001.0101.01			
					***	

Explain any discrepancies: (include lab sample ID numbers):

\*Required pH: Phenols/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS, H2SO4 (pH<2); Metals, HNO3 (pH<2); CN (NaOH or NaOH/Asc Acid) (pH>12); Diss. Sulfide, NaOH (pH>12); T. Sulfide, NaOH/ZnAc (pH>12) P1000474\_Battelle\_JPL GW Mon 1Q10\_G486090 - Page 2 of 2 RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4) 02/10/10 12:55 PM

## **DIVIDER SHEET**

# ANALYTICAL DATA FOR

**Hexavalent Chromium** 

ANALYSIS

Analytical Report

Client :BattelleProject Name :JPL GW Mon 1Q10Project Number :G486090Sample Matrix :WATER

Service Request : P1000474 Date Collected : 02/09/10 Date Received : 02/09/10

Chromium, Hexavalent

Prep Method : None Analysis Method : 7196A Test Notes : Units : mg/L (ppm) Basis : NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
- MW-4-3	P1000474-001	0.010	0.003	1	NΔ	02/09/10 15:15	ND	
MW-4-2	P1000474-001	0.010	0.003	1	NA	02/09/10 15:15	ND	
MW-4-1	P1000474-003	0.010	0.003	1	NA	02/09/10 15:15	ND	
EB-6-2/9/10	P1000474-004	0.010	0.003	1	NA	02/09/10 15:15	ND	
MW-3-4	P1000474-005	0.010	0.003	1	NA	02/09/10 15:15	ND	
MW-3-3	P1000474-006	0.010	0.003	1	NA	02/09/10 15:15	ND	
MW-3-2	P1000474-007	0.010	0.003	1	NA	02/09/10 15:15	ND	
DUPE-3-1Q10	P1000474-008	0.010	0.003	1	NA	02/09/10 15:15	ND	
Method Blank	P1000474-MB	0.010	0.003	1	NA	02/09/10 15:15	ND	

Approved By

Kare Rya Date: - 2/12/10 11

#### QA/QC Report

Client:BattelleProject:JPL GW Mon 1Q10 / G486090

**Service Request:** P1000474 **Date Analyzed:** 02/09/10

Title:	Initial and Continuing Calibration Blank (ICB and CCB) Summary
Analyte:	Chromium, Hexavalent
Method:	7196A
Units:	mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB	0.010	0.003	ND
CCB1	0.010	0.003	ND
CCB2	0.010	0.003	ND

Approved By: \_\_\_\_

Kam Rya 

#### QA/QC Report

Client:	Battelle
Project:	JPL GW Mon 1Q10 / G486090

**Service Request:** P1000474 **Date Analyzed:** 02/09/10

Title:	Initial and Continuing Calibration Verification (ICV and CCV) Summary
Analyte:	Chromium, Hexavalent
Method:	7196A
Units:	mg/L (ppm)

Sample Name	True Value	Result	Percent Recovery	Acceptance Criteria	
ICV CCV1	0.0579 0.0579	0.0548 0.0548	95 95	90-110 90-110	
CCV2	0.0579	0.0558	96	90-110	

Approved By: \_\_\_\_\_

Kau Rya Date: 2/12/10

#### QA/QC Report

Client :	Battelle			Servic	e Reques	st: P1000	)474	
Project Name :	JPL GW Mon 1Q10			Date	Collecte	d: NA		
Project Number :	G486090			Date	Receive	d: NA		
Sample Matrix :	WATER			Date	Extracte	d: NA		
				Date	Analyze	<b>d</b> : 02/09/	/10	
		Labora	tory Control Sam Inorganic Param	ple Summary eters				
Sample Name : Lab Code : Test Notes :	Laboratory Control Sample P1000474-LCS				Unit Basi	ts : mg/L is : NA	(ppm)	
							CAS Percent Recovery	
Analyte		Prep Method	Analysis Method	True Value	Result	Percent Recovery	Acceptance Limits	Result Notes
Chromium, Hexaval	ent	None	7196A	0.0500	0.0389	78	86-114	

Approved By

Kare Rya Date: 2/12/10

QA/QC Report

Client :BattelleProject Name :JPL GW Mon 1Q10Project Number :G486090Sample Matrix :WATER

 Service Request :
 P1000474

 Date Collected :
 02/09/10

 Date Received :
 02/09/10

 Date Extracted :
 NA

 Date Analyzed :
 02/09/10

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name :	MW-4-3		Units : mg/L (ppm)
Lab Code :	P1000474-001MS	P1000474-001DMS	Basis : NA
Test Notes :			

	Prep	Analysis		Spike	Level	Sample	Spike	Result	Sj Rec	oike overy	CAS	Relative	Result
Analyte	Method	hod Method PQL	PQL	MS	DMS	Result	MS	DMS	MS	DMS	Limits Difference	Notes	
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0453	0.0463	91	93	80-120	2	

Approved By

Karen Pya 

2/12/10 15



#### CAS SR #P1000488

#### **Table of Contents**

Cover Letter	1
Case Narrative	2
Acronym List	3
Sample Cross-Reference	4
Chain of Custody	5
Internal Chain of Custody	6
Sample Acceptance Check Form	7
Hexavalent Chromium Analytical Data	8-13
Hexavalent Chromium Raw Data	14-22

2655 Park Center Drive, Suite A

Simi Valley, CA 93065

805 526 7161 805 526 7270 fax

www.caslab.com

1 of

#### LABORATORY REPORT

February 16, 2010

Columbia

Analvtical Services

David Conner Battelle 3990 Old Town Ave., Suite C-205 San Diego, CA 92110

#### **RE: JPL GW Mon 1Q10 / G486090**

Dear David:

Enclosed are the results of the samples submitted to our laboratory on February 10, 2010. For your reference, these analyses have been assigned our service request number P1000488.

All analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains \_\_\_\_\_\_ pages.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-09-TX; Minnesota Department of Health, Certificate No. 11495AA. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

**Columbia Analytical Services, Inc.** 

ne Julerts

Sue Anderson Project Manager

© 100% Recycled Paper


k Center Drive, Suite A I Simi Valley,

Simi Vallev. CA 93065

805 526 7161 | 805 526 7270 fax

www.caslab.com

Client:BattelleProject:JPL GW Mon 1Q10 / G486090

CAS Project No:

P1000488

### CASE NARRATIVE

The samples were received intact under chain of custody on February 10, 2010 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

### Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for utilization of less than the complete report.

### Columbia Analytical Services, Inc.

### Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
Μ	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl tert -Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
թթե	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	Standard Methods for the Examination of Water and Wastewater, 19th Ed., 1995.
SW	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846,
	Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)
VOC	Volatile Organic Compound(s)

### **Qualifiers**

The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
The result is an estimated concentration that is less than the MRL (PQL), but greater than or equal to the MDL.
Analyte detected in the method blank above MRL (PQL).
Estimated; result based on response which exceeded the instrument calibration range.
The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
The reported result is from a dilution.
See case narrative.

### SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P1000488-001	MW-23-4	2/10/10	08:12
P1000488-002	MW-23-3	2/10/10	08:38
P1000488-003	MW-23-2	2/10/10	08:58
P1000488-004	MW-23-1	2/10/10	09:33
P1000488-005	EB-7-2/10/10	2/10/10	09:15



2655 Park Center Drive, Suite A

Simi Valley, Californ Phone (805) 526-7161

nia 93065		
7161	Requested Turnaround Time in Business Days (Surcharges)	please circle

An Employee - Owned Company	Phone (805) 5 Fax (805) 526	526-7161 -7270		Requested Turnaround Time in Business Days (Surcharges) please circle 1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day - Standard						CAS Project No.												
Company Name & Address (	Reporting Infor	mation)	Project N	ame					Anal	ysis M	ethod	and	l/or Aı	nalyte	s				CAS	3 Con	tact:	
	topol ting mion	mation	i rejecti i												1		0 at 61 cancionary 0.0	and the second			Pret	ervative Kev
13ATTE CLE	م مت		JPL	GW M	N IQIO				Т		Pre	serva	ative C	ode								Nono
3990 OLD TOWN	v xvc., c.	- 235	Duciest			+			+											+		None
ENI DIGLE (2)	d G1.110		Project N	umber				ted														HCL
JAN VIEGO, CI			G48	16 090				ntrac													2	HNO3
Project Manager			P.O. # / B	Billing Informa	tion	1 Gas	<b></b>	pcor														NaOH
RAVID CONN	FR		21431	9 BAT	rene	T T	acte	(Su cted)	(p												5	Zn Acetate
Phone F	ax	  	ATTN:	GEMALD	TOMPICINS	□ s	21B	Ditra	/MS racte	3											6	Asc Acid
	ux		505 1	CING AN	IG	IS enate	Subc	801!	GC	512											7	Other
(619) 726-7311			COLUM	BUS, OH	43201	C/N		svel (Su	Subc													
Email Address for Result Rep	porting	Sampl	er (Print & Si	gn)		CS G	15B	w Le	Drgal □ (S													
						gani 60B [	8015 1BC	■ Lo	tile 0													
			-		Number	-0 8	as 802 Viese	FC Fiese	Vola 82	P												Domorko
Client Sample ID	ID Number	Collect	ed Collected	Matrix	Containers	Volatil 624	TPH 0 BTEX TPH C	TPH	Semi- 625	3												nemarks
Mw-23-4		2/10/	- 812	W	1					X												
MW-23-3			838							$\prec$											LEVI	EL IV QC
MW-73-2			858						Τ	X										Τ		
Mu - 23 - 1			922			$\top$				×										1		
1-100 00 1						$\top$			1	ŕ					+			+	+	+		
ER 7-2/12/12		+	915	+		+			+	X		$\neg$					+	+	+	+	FW	10 RIAM.
CD- 1- 21/01/13		<u>  '</u>			<del>  l -</del>												+	+		+	tan	
						+			+			$\rightarrow$						+	+	+-	-	
				+		+	+										_		+	+		
						+								$\rightarrow$					+	—	+	
																				$\perp$	L	
									Τ													
		1		1		1																
				+		-														+		
Report Tier Levels - please sele	 ct	-								1									Pro	oject P	lequiremer	nts (MRLs, QAPP)
Tier I - (Results/Default if not spe Tier II - (Results + QC)	cified)	Tier III - Tier V - (	(Data Validatio client specified	n Package) 10	% Surcharge		MRL MDL	required / PQL / J	Yes / N require	o ed Yes /	No		EDD r Type:	equire	d Yes /	No		-				
Relinquished by: (Signature)	20.1		Date/	10 TIME 55	Received by	Signa	ture)	Y	_	2				2/0	and the	KTT	imto	01				
Relinquisher by (Signature)	C		Date:	Tiples /c	> Received by	(Signa	type (	L K	2		X			D		10 1	2	10	Co	oler / I	Blank / Ice	/ No Ice
Relinquished by: (Signature)			Date;	Time:	Received by	(Signa	ture)	- Andrews	Z	Contraction of the second s				D	áte: 🕴	ľ	ime:		Ter	mperat	ture	°C

Water & Soil - Chain of Custody Record & Analytical Service Request

Page \_\_\_\_ of \_\_\_\_

### Columbia Analytical Services, Inc. Chain of Custody Report

Client: Battelle Project: JPL GW Mon 1Q10/G486090 Service Request: P1000488

Bottle ID	Tests	Date	Time	Sample Location / User	<b>Disposed On</b>
P1000488-001.01					
	7196A				
		2/10/10	1216	SMO / ADAVID	
		2/10/10	1217	P-37 / ADAVID	
		2/10/10	1246	In Lab / SANDERSON	
		2/11/10	0759	P-37 / SANDERSON	
P1000488-002.01					,
	7196A				
		2/10/10	1216	SMO / ADAVID	
		2/10/10	1217	P-37 / ADAVID	
		2/10/10	1246	In Lab / SANDERSON	
		2/11/10	0759	P-37 / SANDERSON	
P1000488-003.01					
	7196A				
		2/10/10	1216	SMO / ADAVID	
		2/10/10	1217	P-37 / ADAVID	
		2/10/10	1246	In Lab / SANDERSON	
		2/11/10	0759	P-37 / SANDERSON	
P1000488-004.01					
	7196A				
		2/10/10	1216	SMO / ADAVID	
		2/10/10	1217	P-37 / ADAVID	
		2/10/10	1246	In Lab / SANDERSON	
		2/11/10	0759	P-37 / SANDERSON	
P1000488-005.01			-		
	7196A				
		2/10/10	1216	SMO / ADAVID	
		2/10/10	1217	P-37 / ADAVID	
		2/10/10	1246	In Lab / SANDERSON	
		2/11/10	0759	P-37 / SANDERSON	

### Columbia Analytical Services, Inc.

Sample Acceptance Check Form

Client:	Battelle			1	_	Work order:	P1000488			
Project:	JPL GW Mon	1Q10 / G486090			-					
Sample(	s) received on:	02/10/10		-	Date opened:	02/10/10	by:	ADAV	ID	
Note: This	form is used for <u>all</u>	samples received by CAS. 7	The use of this for	m for custody seals	is strictly meant	to indicate presence/a	absence and not as an	1 indicatio	on of	
compliance	or nonconformity.	Thermal preservation and pl	H will only be eva	luated either at the	request of the cli	ent and/or as required	l by the method/SOF	Yes	No	N/A
1	Were sample	<b>containers</b> properly r	narked with c	lient sample II	D?			X		
2	Container(s) supplied by CAS?							X		
3	Did sample co	<b>ntainers</b> arrive in go	od condition?	)				X		
4	Was a chain-o	of-custody provided?						X		
5	Was the chair	-of-custody properly	completed?					X		
6	Did sample co	ontainer labels and/o	r tags agree w	vith custody pa	pers?			X		
7	Was sample v	olume received adequ	late for analys	sis?	•			X		
8	Are samples v	vithin specified holdir	ng times?					X		
9	Was proper te	mperature (thermal	preservation)	of cooler at rec	ceipt adhered	to?		X		
	(	Cooler Temperature	3	°C Blank	Temperature		°C			
10	Was a trip bla	ank received?		-						X
	Trip blank s	upplied by CAS:								
11	Were custody	seals on outside of co	oler/Box?						X	
	Location of	seal(s)?					Sealing Lid?			X
	Were signature and date included?							X		
	Were seals i	ntact?								X
	Were custody	seals on outside of sam	mple containe	r?					X	
	Location of	seal(s)?					Sealing Lid?			X
	Were signat	ure and date included	?							X
	Were seals i	ntact?								X
12	Do containers	have appropriate pre	servation, acc	cording to met	hod/SOP or C	Client specified i	nformation?	X		
	Is there a clie	nt indication that the	submitted san	nples are <b>pH</b> p	reserved?					X
	Were <b>VOA v</b>	ials checked for prese	nce/absence o	of air bubbles?						X
	Does the clier	nt/method/SOP requir	e that the ana	lyst check the	sample pH ar	nd <u>if necessary</u> a	lter it?			X
13	Tubes:	Are the tubes cap	ped and intac	t?						X
		Do they contain	moisture?							X
14	Badges:	Are the badges p	roperly cappe	d and intact?						X
		Are dual bed bad	lges separated	and individua	lly capped an	nd intact?				X
Lab	Sample ID	Container	Required	Received	Adjusted	VOA Headspac	e Receip	t / Pres	ervatio	1
		Description	рН *	pH	pH	(Presence/Absence	) (	Comme	its	
P10 <b>004</b> 88	3-001.01	125mL Plastic NP								
P1000488	3-002.01	125mL Plastic NP								
P1000488	3-003.01	125mL Plastic NP								
P1000488	3-004.01	125mL Plastic NP								

Explain any discrepancies: (include lab sample ID numbers):

125mL Plastic NP

P1000488-005.01

 $\label{eq:condition} \ensuremath{^{+}\text{Required pH: Phenols/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS, H2SO4 (pH<2); Metals, HNO3 (pH<2); CN (NaOH or NaOH/Asc Acid) (pH>12); CN (NaOH or NaOH or N$ 

Diss. Sulfide NaOH (nH>12): T Sulfide NaOH/ZnAc (nH>12) for Mon 2009 2010 \_ G486090 - Fage 1 of 1

## **DIVIDER SHEET**

# ANALYTICAL DATA FOR

**Hexavalent Chromium** 

ANALYSIS

Analytical Report

Client :BattelleProject Name :JPL GW Mon 1Q10Project Number :G486090Sample Matrix :WATER

None

Prep Method :

Test Notes :

Analysis Method : 7196A

Service Request : P1000488 Date Collected : 02/10/10 Date Received : 02/10/10

Chromium, Hexavalent

Units : mg/L (ppm) Basis : NA

				Dilution	Date	Date/Time		Result
Sample Name	Lab Code	PQL	MDL	Factor	Extracted	Analyzed	Result	Notes
MW-23-4	P1000488-001	0.010	0.003	1	NA	02/10/10 14:15	ND	
MW-23-3	P1000488-002	0.010	0.003	1	NA	02/10/10 14:15	ND	
MW-23-2	P1000488-003	0.010	0.003	1	NA	02/10/10 14:15	ND	
MW-23-1	P1000488-004	0.010	0.003	1	NA	02/10/10 14:15	ND	
EB-7-2/10/10	P1000488-005	0.010	0.003	1	NA	02/10/10 14:15	ND	
Method Blank	P1000488-MB	0.010	0.003	1	NA	02/10/10 14:15	ND	

Approved By

Kare Rya

#### QA/QC Report

Client:BattelleProject:JPL GW Mon 1Q10 / G486090

**Service Request:** P1000488 **Date Analyzed:** 02/10/10

Title:	Initial and Continuing Calibration Blank (ICB and CCB) Summary
Analyte:	Chromium, Hexavalent
Method:	7196A
Units:	mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB	0.010	0.003	ND
CCB1	0.010	0.003	ND

Approved By: \_\_\_\_\_

Kan Rya Date: 2/12/10

### QA/QC Report

Client:	Battelle	Service Request:	P1000488
Project:	JPL GW Mon 1Q10 / G486090	Date Analyzed:	02/10/10

Title:	Initial and Continuing Calibration Verification (ICV and CCV) Summary
Analyte:	Chromium, Hexavalent
Method:	7196A
Units:	mg/L (ppm)

Sample Name	True Value	Result	Percent Recovery	Acceptance Criteria
ICV	0.0579	0.0550	95	90-110
CCVI	0.0579	0.0560	97	90-110

Approved By: CCV1A/120594

Kare Rya \_\_\_\_\_Date: \_\_\_\_/12/10

### QA/QC Report

Client :	Battelle			Service	e Reques	t: P1000	488	
Project Name :	JPL GW Mon 1Q10			Date	Collected	d: NA		
<b>Project Number :</b>	G486090			Date	Received	d: NA		
Sample Matrix :	WATER			Date 1	Extracte	d: NA		
-				Date	Analyze	<b>d</b> : 02/10/	/10	
		Laborato I	ry Control Sample norganic Parameter	Summary s				
Sample Name : Lab Code : Test Notes :	Laboratory Control Sample P1000488-LCS				Unit Basi	s: mg/L s: NA	(ppm)	
							CAS Percent Recovery	
Analyte		Prep Method	Analysis Method	True Value	Result	Percent Recovery	Acceptance Limits	Result Notes
Chromium, Hexavale	ent	None	7196A	0.0400	0.0382	96	86-114	

Approved By	Kaun	Rya	Date :	2/12/10	1	2
	,	0		/ /	9	10.00

### QA/QC Report

Client :BattelleProject Name :JPL GW Mon 1Q10Project Number :G486090Sample Matrix :WATER

Service Request : P1000488 Date Collected : 02/10/10 Date Received : 02/10/10 Date Extracted : NA Date Analyzed : 02/10/10

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name :	MW-23-4		Units : mg/L (ppm)
Lab Code :	P1000488-001MS	P1000488-001DMS	Basis: NA
Test Notes :			

	Prep	Analysis		Spike	Level	Sample	Spike	Result	Sp Rec	oike overy	CAS	Relative	Result
Analyte	Method	Method	PQL	MS	DMS	Result	MS	DMS	MS	DMS	Limits	Difference	Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0476	0.0466	95	93	80-120	2	

Approved By

Karen Rya

Date : 2/12/10



#### CAS SR #P1000502

### **Table of Contents**

Cover Letter	1
Case Narrative	2
Acronym List	3
Sample Cross-Reference	4
Chains of Custody	5-6
Internal Chains of Custody	7-8
Sample Acceptance Check Form	9-10
Hexavalent Chromium Analytical Data	11-16
Hexavalent Chromium Raw Data	17-25

#### © 100% Recycled Paper



2655 Park Center Drive, Suite A I Sim

Simi Valley, CA 93065

805.526.7161 | 805.526.7270 fax

www.caslab.com

### LABORATORY REPORT

February 16, 2010

David Conner Battelle 3990 Old Town Ave., Suite C-205 San Diego, CA 92110

### **RE: JPL GW Mon 1Q10 / G486090**

Dear David:

Enclosed are the results of the samples submitted to our laboratory on February 11, 2010. For your reference, these analyses have been assigned our service request number P1000502.

All analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains \_\_\_\_\_\_ pages.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-09-TX; Minnesota Department of Health, Certificate No. 11495AA. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

**Columbia Analytical Services, Inc.** 

Juleston

Sue Anderson Project Manager



2655 Park Center Drive, Suite A I S

I Simi Valley, CA 93065

805.526.7161 I 805.526.7270 fax I

Client: Battelle Project: JPL GW Mon 1Q10 / G486090 CAS Project No: P.

P1000502

www.caslab.com

### CASE NARRATIVE

The samples were received intact under chain of custody on February 11, 2010 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

### Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for utilization of less than the complete report.

### **Columbia Analytical Services, Inc.**

### Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
Μ	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl tert -Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
թթե	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	Standard Methods for the Examination of Water and Wastewater, 19th Ed., 1995.
SW	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846,
-	Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TDS	Total Dissolved Solids
ТРН	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)
VOC	Volatile Organic Compound(s)

### Qualifiers

U	The compound	was analyzed for,	but was not d	letected ("Non-de	etect") at or above	e the MRL/MDL.
---	--------------	-------------------	---------------	-------------------	---------------------	----------------

- J The result is an estimated concentration that is less than the MRL (PQL), but greater than or equal to the MDL.
- B Analyte detected in the method blank above MRL (PQL).
- E Estimated; result based on response which exceeded the instrument calibration range.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- **D** The reported result is from a dilution.
- X See case narrative.

### SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P1000502-001	MW-22-3	2/11/10	07:53
P1000502-002	MW-22-2	2/11/10	08:15
P1000502-003	MW-22-1	2/11/10	08:40
P1000502-004	EB-8-2/11/10	2/11/10	08:29
P1000502-005	MW-11-3	2/11/10	10:16
P1000502-006	MW-11-2	2/11/10	10:47
P1000502-007	MW-11-1	2/11/10	11:15
P1000502-008	DUPE-4-1Q10	2/11/10	00:00



### Water & Soil - Chain of Custody Record & Analytical Service Request

Page \_\_\_\_ of \_\_\_\_?

Analytical Services NC. An Employee - Owned Company	2655 Park Cer Simi Valley, Ca Phone (805) 5 Fax (805) 526	nter Drive, alifornia 93 526-7161 5-7270	Suite A 3065	Requested 1 Day (100%	<b>Turnaround</b> 6) 2 Day (75	<b>Time</b> %) 3	<b>in Bu</b> Day	<b>isines</b> (50%)	<b>s Day</b> 4 Da	<b>/s (Sı</b> ıy (35'	urcharg %) 5 D	<b>jes) p</b> Day (25	<b>lease</b> 5%) 1	<b>circle</b> 0 Day	- Stai	ndard			CAS Pr	oject No.	507	
Company Name & Address (R	eporting Inform	mation)	Project N	ame		1				Analy	/sis Me	ethod	and/c	r Ana	lytes					intaot.		
BATTELLÉ 3990 OLD TOWN SAN DIEGO, GA	AVE., 0 9211	0	JPL Project N G49	GW MwM umber 36090	) /Q10			intracted)			0	Pres	ervati	ve Coo						Pre 0 1 2 3	servativ No Hi Hi	e Key one CL NO3
Project Manager $\overrightarrow{DAVID}$ Co N Phone Fa (GIA)726-7311 Email Address for Result Repo	NER ax	Sampler	P.O. # / B 21431 ATTN: 4 5 05 Col UP (Print & Sig	illing Informati GEAND KING MUSOH	on ITELLE ISMIICKUS A.E 43221	rganics GC/MS 60B □ Oxygenates □ TPH Ga	8015B    18    MTBE 8021B	el 8015B 🗆 (Subcontracted) el Low Level 8015B 🗆 (Subco	8015M (Subcontracted)	title Organics GC/MS 270C ⊟ (Subcontracted)	(1196)									4 5 6 7	Ni Zr As	aOH Acetate sc Acid ther
Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Ol 624   82	TPH Gas BTEX 802	TPH Dies TPH Dies	TPH FC	Semi-Vola 625 □ 82	5										Remarl	(S
Mw-22-3	1	2/11/10	753	W	1		ļ				X				_							
MW-22-2	2	<u>   </u>	815								X						ļ			Lev	el IV	QL
MW-22-1	3	<u>                                      </u>	840								+										****	-
EB-8-2/11/10	4		829								×									ΕŴ	11 <b>1</b> . Bi	DUIC
											i i Ng i											
		1															-					
Report Tier Levels - please select Tier I - (Results/Default if not speci Tier II - (Results + QC)	t fied)	Tier III - (D Tier V - (clie	ata Validation	n Package) 10%	Surcharge		MF ME	L RL requ DL / PQ	ired Ye L / J r	es / No	) d Yes / N	10	E Ty	DD req	uired Y	es / No	)		Project	l Requireme	nts (MRLs	s, QAPP)

Tier II - (Results + QC)	Tier V - (client specified)	MDL / PQL / J required Yes / No	Туре:	
Relinquished by: (Signature)	Date: 11/10 Time: 30	Received by: (Signature)	2 parte: 10 Time 220	
Relinquished by (argnature)	2 Dete: 10 19330	Received (Signature)	00 ANG: 10 TMS 30	Cooler / Blank / Ice / No Ice
Relinquished by: (Signature)	Date: Time:	Received by: (Signature)	Date: Time:	Temperature °C



### Water & Soil - Chain of Custody Record & Analytical Service Request

Page 2 of 2

2655 Park Center Drive, Suite A Simi Valley, California 93065 Phone (805) 526-7161 Fax (805) 526-7270

Requested Turnaround Time in Business Days (Surcharges) please circle	CAS Project No507
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day - Standard	11000000

Company Name & Address (Departing Information)	Drojaat Noma	Analysis Method and/or Analytes	Contact:
		Preservative Code	Preservative Key
29GD OLD TOLW AVE. C-205	JPL GW MON IQIO		0 None
	Project Number	(pearline and pearline and pe	1 HCL
SAN DUEGO, CA 42110	G486090		2 HNO3
Project Manager	P.O. # / Billing Information		3 H2SO4
DAVID CONVER	214319 BATTELLE		5 Zn Acetate
Phone Fax	ATTN: GEMALD TOMPKIN		6 Asc Acid
(10) 721 724	505 KING AVE	VIS Sub B01 S S S S S S S S S S S S S S S S S S S	7 Other
Email Address for Besult Beporting Sampler	(Print & Sign)		
	N		Demoster
Client Sample ID Laboratory Date Collected	Collected Matrix Contain		Hemarks
Mw-11-3 5 2/4/1=	1016 W 1		LEVEL IT QL
MW-11-2 61	1047 1 2		MS/MSD
Mw-11 1 7	1115 1		
DIRE-4-1010 8			DUPLICATE
60 1 110			EDUIR BLOUK
			Ettor, Ochina
			+
Report Tier Levels - please select           Tier I - (Results/Default if not specified)         Tier III - (E           Tier II - (Results + QC)         Tier V - (cli	Data Validation Package) 10% Surcharg	MRL required Yes / No EDD required Yes / No MDL / PQL / J required Yes / No Type:	ect Requirements (MRLs, QAPP)
Relinquished by: (Signature)	Date Time: Receiv	by: (Signature) 2 (Date: 10 Tingen 2)	
Relinquished and Signature)	Date: 10 Time 33 G Receiv	by: (Signature) Un Attack Date Date Time: 370 Coo	oler / Blank / Ice / No Ice
Relinquished by: (Signature)	Date: Time: Receiv	by:(Signature) Date: Time: Tem	nperature °C

### Columbia Analytical Services, Inc. Chain of Custody Report

Client: Battelle Project: JPL GW Mon 1Q10/G486090 Service Request: P1000502

Bottle ID	Tests	Date	Time	Sample Location / User	<b>Disposed On</b>
P1000502-001.01					
	7196A				
		2/11/10	1339	SMO / SSTAPLES	
		2/11/10	1354	In Lab / SANDERSON	
		2/11/10	1613	P-377 SANDERSON	
P1000502-002.01					
	7196A	2/11/10	1220	OMO / COTADI ES	
		2/11/10	1339	SMO/SSIAPLES	
		2/11/10	1613	P-37 / SANDERSON	
		2/11/10	1015	1-577 SMIDERSON	
P1000502-003.01	5104				
	7196A	2/11/10	1330	SMO / SSTAPI ES	
		2/11/10	1354	In Lab / SANDERSON	
		2/11/10	1613	P-37 / SANDERSON	
		2.11.110			
P1000502-004.01	71064				
	/190A	2/11/10	1339	SMO / SSTAPLES	
		2/11/10	1354	In Lab / SANDERSON	
		2/11/10	1613	P-37 / SANDERSON	
P1000502-005.01	71064				
	/190A	2/11/10	1339	SMO / SSTAPLES	
		2/11/10	1354	In Lab / SANDERSON	
		2/11/10	1613	P-37 / SANDERSON	
P1000502-006 01	· · · · · · · · · · · · · · · · · · ·				
1 1000502-000.01	7196A				
		2/11/10	1339	SMO / SSTAPLES	
		2/11/10	1354	In Lab / SANDERSON	
		2/11/10	1613	P-37 / SANDERSON	
P1000502-006.02					
		2/11/10	1339	SMO / SSTAPLES	
		2/11/10	1354	In Lab / SANDERSON	
		2/11/10	1613	P-37 / SANDERSON	
P1000502-007 01					
1 1000302-007.01	7196A				
		2/11/10	1339	SMO / SSTAPLES	
		2/11/10	1354	In Lab / SANDERSON	
		2/11/10	1613	P-37 / SANDERSON	
P1000502-008.01					
	7196A				7
		2/11/10	1339	SMO / SSTAPLES	

### Columbia Analytical Services, Inc. Chain of Custody Report

Client: Battelle Project: JPL GW Mon 1Q10/G486090 Service Request: P1000502

Bottle ID	Tests	Date	Time	Sample Location / User	<b>Disposed On</b>
		2/11/10 2/11/10	1354 1613	In Lab / SANDERSON P-37 / SANDERSON	

#### Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client	: Battelle		Sump	ie meeepiumee		Work order:	P1000502			
Project:	: JPL GW Mon	1Q10 / G486090								
Sample	(s) received on:	02/11/10			Date opened:	02/11/10	by:	SSTAF	PLES	
<u>Note:</u> This	form is used for <u>all</u>	samples received by CAS.	The use of this for	m for custody seals	is strictly meant	to indicate presence/at	osence and not as a	n indicatio	on of	
compliance	or nonconformity.	Thermal preservation and pl	H will only be eva	luated either at the	request of the cli	ent and/or as required	by the method/SOF	). Ves	No	N/A
1	Were sample	containers properly t	narked with c	lient sample II	יר					
1	Container(s)	supplied by CAS?		nont sample n						
2	Did sample of	ontainers arrive in go	od condition?	,						
5	Was a chain	of oustady provided?	ou condition.							
4	Was the chain-	of custody provided?	completed?							
5	Did sample a	antainen labela and/a	r tage agree w	rith quatody po	neral					
0	Was sample of	volume received adec	i tags agree w	in custouy pa	pers?					
/		within appointed holding	atimor?	518 /						
0	Was proper to	mananatura (thormal)	reconvertion)	of cooler at rea	oint adharad	tol				
9	was proper te	Sooler Temperature	preservation)	°C Plonk	Temperature	101	°C			
10	Was a trip bl	and received?		- C Dialik	remperature	4				
10	Trip blank s	and received?								
11	Were custody	seals on outside of co	oler/Box?				-		X	
	Location of	seal(s)?					Sealing Lid?			X
	Were signat	ure and date included	?				_ 0			X
	Were seals i	ntact?								X
	Were custody	seals on outside of sa	nple containe	r?					X	
	Location of	seal(s)?	1				Sealing Lid?			X
	Were signat	ure and date included	?							X
	Were seals i	ntact?								X
12	Do containers	have appropriate <b>pre</b>	servation, acc	cording to met	hod/SOP or C	Client specified in	formation?	X		
	Is there a clie	nt indication that the	submitted san	nples are <b>pH</b> p	reserved?	1				
	Were VOA v	ials checked for prese	nce/absence o	f air bubbles?						
	Does the clier	t/method/SOP requir	e that the anal	lyst check the	sample nH an	if necessary alt	er it?	П		
13	Tubes:	Are the tubes cap	ped and intact	1950 eneek the 19	sampre pri an	ta <u>in necessar j</u> an				
15		Do they contain	moisture?							
14	Radges.	Are the badges n	roperly cappe	d and intact?						
17	Dudges.	Are dual bed bad	ves senarated	and individua	lly capped an	d intact?				
			ges separated		ny capped an					
Lab	Sample ID	Container	Required	Received	Adjusted	VOA Headspace	Receip	t / Pres	ervation	I
		exscription	րո	pn	թո	(Presence/Absence)	Г	-0110101	115	
P1000502	2-001.01	125mL Plastic NP								
P1000502	2-002.01	125mL Plastic NP								
P1000502	2-004.01	125mL Plastic NP								
P1000502	2-005.01	125mL Plastic NP		ano manoni ang kananyo ng pangababahayi minining						

Explain any discrepancies: (include lab sample ID numbers):

125mL Plastic NP

P1000502-006.01

\*Required pH: Phenols/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS, H2SO4 (pH<2); Metals, HNO3 (pH<2); CN (NaOH or NaOH/Asc Acid) (pH>12); Diss. Sulfide: NaOH (pH>12); T. Sulfide: NaOH/ZnAc (pH>12) H000052\_Battelle: pH2 GW Mon R10\_\_C486000 - rage 1 of 2 RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

### Columbia Analytical Services, Inc.

Sample Acceptance	Check	Form
-------------------	-------	------

<b>F</b> • • • • • • • • • • • • • • • • • • •		
Work order:	P1000502	
Date opened: 02/11/10	by:	SSTAPLES
	Work order: Date opened: 02/11/10	Work order:         P1000502           Date opened:         02/11/10         by:

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1000502-006.02	125mL Plastic NP					
P1000502-007.01	125mL Plastic NP		· · · ·			
P1000502-008.01	125mL Plastic NP					
·						
·						
						٦

Explain any discrepancies: (include lab sample ID numbers):

# DIVIDER SHEET ANALYTICAL DATA FOR

**Hexavalent Chromium** 

ANALYSIS

Analytical Report

Battelle Client : Project Name : JPL GW Mon 1Q10 Project Number : G486090 Sample Matrix : WATER

None

Prep Method :

Test Notes :

Analysis Method: 7196A

Service Request : P1000502 **Date Collected :** 02/11/10 **Date Received :** 02/11/10

Chromium, Hexavalent

Units : mg/L (ppm) Basis: NA

				Dilution	Date	Date/Time		Result
Sample Name	Lab Code	PQL	MDL	Factor	Extracted	Analyzed	Result	Notes
MW-22-3	P1000502-001	0.010	0.003	1	NA	02/11/10 15:15	ND	
MW-22-2	P1000502-002	0.010	0.003	1	NA	02/11/10 15:15	ND	
MW-22-1	P1000502-003	0.010	0.003	1	NA	02/11/10 15:15	ND	
EB-8-2/11/10	P1000502-004	0.010	0.003	1	NA	02/11/10 15:15	ND	
MW-11-3	P1000502-005	0.010	0.003	1	NA	02/11/10 15:15	ND	
MW-11-2	P1000502-006	0.010	0.003	1	NA	02/11/10 15:15	ND	
MW-11-1	P1000502-007	0.010	0.003	1	NA	02/11/10 15:15	ND	
DUPE-4-1Q10	P1000502-008	0.010	0.003	1	NA	02/11/10 15:15	ND	
Method Blank	P1000502-MB	0.010	0.003	1	NA	02/11/10 15:15	ND	

Approved By

Kaun Rya Date: 2/12/10

### QA/QC Report

Client:BattelleProject:JPL GW Mon 1Q10 / G486090

**Service Request:** P1000502 **Date Analyzed:** 02/11/10

Title:	Initial and Continuing Calibration Blank (ICB and CCB) Summary
Analyte:	Chromium, Hexavalent
Method:	7196A
Units:	mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB CCB1 CCB2	0.010 0.010 0.010	0.003 0.003 0.003	ND ND ND

Approved By: ICCBMDL/120594

Kan Rya 

### QA/QC Report

Client:BattelleProject:JPL GW Mon 1Q10 / G486090

**Service Request:** P1000502 **Date Analyzed:** 02/11/10

Title:	Initial and Continuing Calibration Verification (ICV and CCV) Summary
Analyte:	Chromium, Hexavalent
Method:	7196A
Units:	mg/L (ppm)

	True		Percent	Acceptance	
Sample Name	Value	Result	Recovery	Criteria	
ICV	0.0579	0.0545	94	90-110	
CCV1	0.0579	0.0566	98	90-110	
CCV2	0.0579	0.0556	96	90-110	

Approved By: CCV1A/120594

\_Date: 2/12/10 Kam Rya

QA/QC Report

Client :	Battelle			Service	e Reques	t: P1000	502	
Project Name :	JPL GW Mon 1Q10			Date	Collecte	d: NA		
Project Number :	G486090			Date	Receive	d: NA		
Sample Matrix :	WATER			Date 1	Extracte	d: NA		
·				Date	Analyze	<b>d</b> : 02/11/	10	
		Laborat	tory Control Sam Inorganic Param	ble Summary eters				
Sample Name : Lab Code : Test Notes :	Laboratory Control Sample P1000502-LCS				Unit Basi	s: mg/L s: NA	(ppm)	
							CAS Percent Recovery	
Analyte		Prep Method	Analysis Method	True Value	Result	Percent Recovery	Acceptance Limits	Result Notes
Chromium, Hexaval	ent	None	7196A	0.0400	0.0397	99	86-114	

Approved By

Karer Ryge Date: 2/12/10

### QA/QC Report

Client :BattelleProject Name :JPL GW Mon 1Q10Project Number :G486090Sample Matrix :WATER

Service Request : P1000502 Date Collected : 02/11/10 Date Received : 02/11/10 Date Extracted : NA Date Analyzed : 02/11/10

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name :	MW-11-2		Units : mg/L (ppm)
Lab Code :	P1000502-006MS	P1000502-006DMS	Basis: NA
Test Notes :			

Analyte	Prep Method	Analysis Method	PQL	Spike MS	Level DMS	Sample Result	Spike MS	Result DMS	Sp Reco MS	oike overy DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0524	0.0513	105	103	80-120	2	

Approved By

Kaller Pyz Date: 2/12/10



### CAS SR #P1000545

#### **Table of Contents**

Cover Letter	
Case Narrative	1
Acronym List	
Sample Cross-Reference	
Chain of Custody5	
Internal Chain of Custody	
Sample Acceptance Check Form	
Hexavalent Chromium Analytical Data	-13
Hexavalent Chromium Raw Data	4-23

2655 Park Center Drive, Suite A

Simi Valley, CA 93065

805.526.7161 | 805.526.7270 fax

www.caslab.com

### LABORATORY REPORT

February 16, 2010

Columbia

Analytical Services

David Conner Battelle 3990 Old Town Ave., Suite C-205 San Diego, CA 92110

### **RE: JPL GW Mon 1Q10 / G486090**

Dear David:

Enclosed are the results of the samples submitted to our laboratory on February 15, 2010. For your reference, these analyses have been assigned our service request number P1000545.

All analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains 22 pages.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-09-TX; Minnesota Department of Health, Certificate No. 11495AA. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

**Columbia Analytical Services, Inc.** 

The Judesta

Sue Anderson Project Manager



2655 Park Center Drive, Suite A

Simi Valley, CA 93065

805.526.7161 I 805.526.7270 fax

270 fax I www.caslab.com

Client: Battelle Project: JPL GW Mon 1Q10 / G486090 CAS Project No:

P1000545

### **CASE NARRATIVE**

The samples were received intact under chain of custody on February 15, 2010 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

### Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for utilization of less than the complete report.

### **Columbia Analytical Services, Inc.**

### Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
Μ	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl tert -Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
թթե	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	Standard Methods for the Examination of Water and Wastewater, 19th Ed., 1995.
SW	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods , SW-846,
	Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)
VOC	Volatile Organic Compound(s)

### Qualifiers

U The compound was	analyzed for, but was not o	detected ("Non-detect") a	at or above the MRL/MDL.
--------------------	-----------------------------	---------------------------	--------------------------

- J The result is an estimated concentration that is less than the MRL (PQL), but greater than or equal to the MDL.
- **B** Analyte detected in the method blank above MRL (PQL).
- E Estimated; result based on response which exceeded the instrument calibration range.
- NThe result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.DThe reported result is from a dilution.
- X See case narrative.

### SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P1000545-001	MW-12-3	2/15/10	10:40
P1000545-002	MW-12-2	2/15/10	11:03
P1000545-003	MW-12-1	2/15/10	11:31
P1000545-004	EB-10-2/15/10	2/15/10	11:17



Relinquished by: (Signature)

### Water & Soil - Chain of Custody Record & Analytical Service Request Page \_\_\_\_ of \_\_\_\_

2655 Park Center Drive, Suite A Simi Valley, California 93065 CAS Project No. PIODDSHS Requested Turnaround Time in Business Days (Surcharges) please circle Phone (805) 526-7161 1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day - Standard Fax (805) 526-7270 CAS Contact Analysis Method and/or Analytes Company Name & Address (Reporting Information) Project Name BATTELLE 3990 OLD TOWN AVE., C-LOS **Preservative Key** Preservative Code JPL GW MWN 1600 Project Number  $\cap$ 0 None 1 HCL SAN DIEGO, CA 92100 G486090 HNO3 2 3 H2SO4 P.O. # / Billing Information 214319 / BATTELLE ATTN: GERAUD TONPRINS 505 KINC AVE (OLUMBUS, OH 43201 Sampler (Print & Sign) Project Manager NaOH 4 Phone Fax Semi-Volatile Organics GC/MS 625 

8270C 

(Subcontracted) 5 Zn Acetate 1 Asc Acid 6 7196 7 Other (619)726-7311 Email Address for Result Reporting 5 Remarks Date Time Number of Laboratory Client Sample ID Matrix ID Number Collected Collected Containers MW-12-3 MW-12-2 MW-12-1 7/15/10 1040 W Х 2 1103 3 1131  $\checkmark$ LEVEL IT WC H EB-10-2/15/10 EWUIP. BLANK 1117 **Report Tier Levels - please select** Project Requirements (MRLs, QAPP) MRL required yes / No/ EDD required Yes / No Tier III - (Data Validation Package) 10% Surcharge Tier I - (Results/Default if not specified) MDL / POL / required Yes / No Type: Tier II - (Results + QC) Tier V - (client specified) Relinquished by: (Sign Received by: (Signature) Time: 4 Cooler / Blank / Ice / No Ice Pater ived by: (Signature) 13:4A Time -10 117 Temperature 3°C °C

Received by: (Signature)

Date:

Time:

### Columbia Analytical Services, Inc. Chain of Custody Report

Client: Battelle Project: JPL GW Mon 1Q10/G486090 Service Request: P1000545

Bottle ID	Tests	Date	Time	Sample Location / User	<b>Disposed On</b>
P1000545-001.01					
	7196A				
		2/15/10	1557	SMO / MZAMORA	
		2/15/10	1558	P-37 / MZAMORA	
		2/15/10	1623	In Lab / SANDERSON	
		2/15/10	1757	P-37 / SANDERSON	
P1000545-002.01					
	7196A				
		2/15/10	1557	SMO / MZAMORA	
		2/15/10	1558	P-37 / MZAMORA	
		2/15/10	1623	In Lab / SANDERSON	
		2/15/10	1757	P-37 / SANDERSON	
P1000545-003.01					
	7196A				
		2/15/10	1557	SMO / MZAMORA	
		2/15/10	1558	P-37 / MZAMORA	
		2/15/10	1623	In Lab / SANDERSON	
		2/15/10	1757	P-37 / SANDERSON	
P1000545-004.01					
	7196A				
		2/15/10	1557	SMO / MZAMORA	
		2/15/10	1558	P-37 / MZAMORA	
		2/15/10	1623	In Lab / SANDERSON	
		2/15/10	1757	P-37 / SANDERSON	
### Columbia Analytical Services, Inc.

	D (( 11		Samp	le Acceptance	Check Forn	n Maula audam	D1000545			
Client	: Battelle	1010/0496000			-	Work order:	P1000545	Aperata National Academic Providence		
Sample	(s) received on:	02/15/10	an an an the second		Date opened:	02/15/10	hv.	MZAN	/ORA	
Note: This	form is used for all	samples received by CAS.	The use of this for	- m for custody seals	is strictly meant	to indicate presence/	absence and not as a	n indicatio	on of	
compliance	or nonconformity.	Thermal preservation and pl	H will only be eva	luated either at the	request of the cli	ent and/or as required	d by the method/SOI	2.		
1		× ×	·		-	-		Yes	<u>No</u>	<u>N/A</u>
1	Were sample	containers properly r	narked with c	lient sample II	D?			X		
2	Container(s) s	upplied by CAS?						X		
3	Did sample c	ontainers arrive in go	od condition?	2				X		
4	Was a chain-	of-custody provided?						X		
5	Was the <b>chain</b>	n-of-custody properly	completed?					X		
6	Did sample c	ontainer labels and/o	r tags agree w	vith custody pa	pers?			X		
7	Was sample v	volume received adequ	late for analys	sis?				X		
8	Are samples w	vithin specified holdin	ng times?					X		
9	Was proper te	mperature (thermal j	preservation)	of cooler at rec	eipt adhered	to?		X		
	(	Cooler Temperature		°C Blank	Temperature	3	°C			
10	Was a <b>trip bl</b> a	ank received?								X
	Trip blank s	upplied by CAS:								
11	Were custody	seals on outside of co	oler/Box?						×	
	Location of	seal(s)?					Sealing Lid?			X
	Were signat	ure and date included	?							X
	Were seals i	ntact?								X
	Were custody	seals on outside of sam	mple containe	er?					$\mathbf{X}$	
	Location of	seal(s)?					Sealing Lid?			X
	Were signat	ure and date included	?							X
	Were seals i	ntact?								X
12	Do containers	have appropriate pre	servation, ac	cording to met	hod/SOP or C	Client specified i	nformation?	X		
	Is there a clie	nt indication that the	submitted san	nples are <b>pH</b> p	reserved?					X
	Were <b>VOA v</b>	ials checked for prese	nce/absence c	of air bubbles?						$\mathbf{X}$
	Does the clier	nt/method/SOP requir	e that the ana	lyst check the	sample pH ar	nd if necessary a	lter it?			X
13	Tubes:	Are the tubes cap	ped and intac	t?	1 1					X
		Do they contain	moisture?							X
14	Badges:	Are the badges p	roperly cappe	d and intact?						X
	5	Are dual bed bad	lges separated	and individua	lly capped an	nd intact?				X
Lak	Samula ID	Containan	Required	Received	Adhicted	VOA Handanaa	e Panete		ervation	
Ent	campie 112	Description	nequirea pH *	pH	pH	(Presence/Absence	e Neterp	Commen	its	
P100054	5 001 01	125mI Diastia ND				1				
P100054	5-002.01	125mL Plastic NP								
P100054:	5-003.01	125mL Plastic NP	*********							
P100054:	5-004.01	125mL Plastic NP								

Explain any discrepancies: (include lab sample ID numbers):

\*Required pH: Phenols/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS, H2SO4 (pH<2); Metals, HNO3 (pH<2); CN (NaOH or NaOH/Asc Acid) (pH>12);

Diss. Sulfide NaOH (nH>12): T Sulfide NaOHZnAc (nH>12): T Sulfide NaOHZnAc (nH>12): T Sulfide NaOHZnAc (nH>12): GW Mon 1010 G486090 - Page 1 of 1

# **DIVIDER SHEET**

## ANALYTICAL DATA FOR

**Hexavalent Chromium** 

ANALYSIS

#### CULUMBIA ANALY HUAL SERVICES, INC.

Analytical Report

Client : Battelle Project Name : JPL GW Mon 1Q10 Project Number : G486090 Sample Matrix : WATER

None

Prep Method :

Test Notes :

Analysis Method: 7196A

Service Request : P1000545 **Date Collected :** 02/15/10 Date Received : 02/15/10

Chromium, Hexavalent

Units : mg/L (ppm) Basis: NA

Course I. Norre	Lab Cada	DOI	MDI	Dilution	Date Extracted	Date/Time	Dogult	Result
Sample Name	Lab Code	PQL	MDL	Factor	Extracted	Anaryzeu	Result	Notes
MW-12-3	P1000545-001	0.010	0.003	1	NA	02/15/10 17:30	ND	
MW-12-2	P1000545-002	0.010	0.003	1	NA	02/15/10 17:30	ND	
MW-12-1	P1000545-003	0.010	0.003	1	NA	02/15/10 17:30	ND	
EB-10-2/15/10	P1000545-004	0.010	0.003	1	NA	02/15/10 17:30	ND	
Method Blank	P1000545-MB	0.010	0.003	1	NA	02/15/10 17:30	ND	

Approved By

KAUL RYA Date: 2/14/10

9

#### QA/QC Report

Client:	Battelle	
Project:	JPL GW Mon 1Q10 / G486090	

 Service Request:
 P1000545

 Date Analyzed:
 02/15/10

Title:	Initial and Continuing Calibration Blank (ICB and CCB) Summary
Analyte:	Chromium, Hexavalent
Method:	7196A
Units:	mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB CCB1 CCB2	0.010 0.010 0.010	0.003 0.003 0.003	ND ND ND

Kare Rya Date: 2/14/10 Approved By: \_\_\_\_ ICCBMDL/120594

#### QA/QC Report

#### Client: Battelle Project: JPL GW Mon 1Q10 / G486090

#### **Service Request:** P1000545 **Date Analyzed:** 02/15/10

Title:	Initial and Continuing Calibration Verification (ICV and CCV) Summary
Analyte:	Chromium, Hexavalent
Method:	7196A
Units:	mg/L (ppm)

	True	Percent	Acceptance	
Sample Name	Value	Result	Recovery	Criteria
ICV	0.0579	0.0595	103	90-110
CCVI	0.0579	0.0584	101	90-110
CCV2	0.0579	0.0595	103	90-110

Approved By: CCV1A/120594

KAUL Pyr Date: 2/110/10

### QA/QC Report

Client :	Battelle			Servic	e Reques	t: P1000	)545	
Project Name :	JPL GW Mon 1Q10			Date	Collecte	d: NA		
Project Number :	G486090			Date	Receive	d: NA		
Sample Matrix :	WATER			Date 1	Extracte	d: NA		
-				Date	Analyze	<b>d</b> : 02/15/	/10	
		Laborato I	ory Control San Inorganic Para	nple Summary meters				
Sample Name : Lab Code : Test Notes :	Laboratory Control Sample P1000545-LCS				Unit Basi	s: mg/L s: NA	(ppm)	
							CAS Percent Recovery	
Analyte		Prep Method	Analysis Method	True Value	Result	Percent Recovery	Acceptance Limits	Result Notes
Chromium, Hexavale	ent	None	7196A	0.0400	0.0413	103	86-114	

Approved By	Karu Rya	Date : 2/10/10	12
-------------	----------	----------------	----

#### QA/QC Report

Client:BattelleProject Name:JPL GW Mon 1Q10Project Number:G486090Sample Matrix:WATER

 Service Request :
 P1000545

 Date Collected :
 02/15/10

 Date Received :
 02/15/10

 Date Extracted :
 NA

 Date Analyzed :
 02/15/10

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name :	MW-12-3		Units : mg/L (ppm)
Lab Code :	P1000545-001MS	P1000545-001DMS	Basis : NA
Test Notes :			

	Prep	Analysis		Spike	Level	Sample	Spike	Result	Sp Rec	oike overy	CAS	Relative	Result
Analyte	Method	Method PQI	PQL	MS	DMS	Result	MS	DMS	MS	DMS	S Limits	Difference Notes	
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0488	0.0488	98	98	80-120	<1	

Approved By	Kare	Rua	Date :	2/10/10	13
	7.00	Ő		/ /	



#### CAS SR #P1000546

#### **Table of Contents**

Cover Letter	1
Case Narrative	2
Acronym List	3
Sample Cross-Reference	4
Chain of Custody	5
Internal Chain of Custody	6
Sample Acceptance Check Form	7
Hexavalent Chromium Analytical Data	8-13
Hexavalent Chromium Raw Data	

2655 Park Center Drive, Suite A

Simi Valley, CA 93065

805.526.7161 I 805.526.7270 fax

#### www.caslab.com

### LABORATORY REPORT

February 16, 2010

Columbia

Analvtical Services™

David Conner Battelle 3990 Old Town Ave., Suite C-205 San Diego, CA 92110

#### RE: JPL-GW-1Q10 / G005862

Dear David:

Enclosed are the results of the samples submitted to our laboratory on February 15, 2010. For your reference, these analyses have been assigned our service request number P1000546.

All analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains <u>2</u> pages.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-09-TX; Minnesota Department of Health, Certificate No. 11495AA. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

**Columbia Analytical Services, Inc.** 

he Judeste

Sue Anderson Project Manager



2655 Park Center Drive, Suite A I Simi Va

www.caslab.com

Client: Battelle Project: JPL-GW-1Q10/G005862 CAS Project No:

P1000546

#### CASE NARRATIVE

The samples were received intact under chain of custody on February 15, 2010 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

#### Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for utilization of less than the complete report.

### Columbia Analytical Services, Inc.

#### Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
Μ	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl tert -Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
$\mathbf{SM}$	Standard Methods for the Examination of Water and Wastewater , 19th Ed., 1995.
SW	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods , SW-846,
	Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)
VOC	Volatile Organic Compound(s)

#### Qualifiers

U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
J	The result is an estimated concentration that is less than the MRL (PQL), but greater than or equal to the MDL.
В	Analyte detected in the method blank above MRL (POL).

- E Estimated; result based on response which exceeded the instrument calibration range.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- **D** The reported result is from a dilution.
- X See case narrative.

#### SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P1000546-001	MW-7	2/15/10	09:15
P1000546-002	MW-16	2/15/10	11:40
P1000546-003	MW-6	2/15/10	14:40



2655 Park Center Drive, Suite A Simi Valley, California 93065

## Water & Soil - Chain of Custody Record & Analytical Service Request

Page \_\_\_\_ of \_\_\_\_

An Employee - Owned Company	Phone (805) 5 Fax (805) 526	26-7161 -7270		Requested 1 Day (100°	<b>Turnaround</b> %) 2 Day (75	<b>Гіте</b> %) З	<b>in Bu</b> Day (	<b>sines</b> : 50%)	s Day 4 Da	<b>/s (Si</b> iy (35	wirchar %) 5	<b>ges) p</b> Day (2	<b>leas</b> 5%)	e circ 10 D	s <b>le</b> ay - S	itanda	ard			0	CAS F	<sup>2</sup> roje	OOO	25	46
Company Name & Address	Reporting Infor	mation)	Project Na	ame		-				Analy	/sis M	ethod	and	/or Ai	nalyte	s				10	CAS	Conta	ict:	-	
Battelle		nationy	501	(1.1-1	010							Pres	serva	ative C	ode								Prese	ervativ	e Key
505 King H	JC -		SPC-	Guri	QUV	-					0		_										0	No	one
Columbus, OH	43201		Project IN	umper				icted)															1	н	CL NO3
	<b>t</b> /	-	6003	5862		as 🗆		ontra															3	H	2SO4
Project Manager			P.O. # / Bi	lling Informa	tion	CPH G		cted) Subc	(pe		( 4												4	Na	aOH
David Conne	2/		ATU T	Tern Tom	okins		18	ontra( B □ (	Itract	MS acted	$\vee$												5	Zr	1 Acetate
(19-726-7211	rax	1/41	505	King Ave		AS enates	802	Subco 8015	lbcor	GC/I contra	ŏ												7	0	ther
Email Address for Result Re	porting	Sampler	Print & Sic	<u>olumbus, O</u> in)	4 43201	GC/A	MTBI	B □ (; Level	M (Si	anics (Sub	Å	-													
conned @ britelk.	019	Campion	(i fint & Oig	,,		rganics 260B 🗆	8015B	el 80151 el Low I	015	atile Org 270C	76														
Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile O 624 🗆 82	TPH Gas BTEX 802	TPH Dies TPH Dies	TPH FC	Semi-Vola 625 □ 82	710												F	Remark	s
MU/-M	$\widehat{\mathbb{O}}$	2/15/10	0915	AQ	19	1					X														
MW-16	2	215/10	1140	ÂQ	IP						×														
MW-6	$\bigcirc$	A15/10	1440	ÁQ	P						×														- 
MW-6-MS/ms	0	2/15/10	1440	Aa	IP						×												ms/m	SD	
																								0.514 MAG 00.000 PM 200	
												-													
						ļ																			
	-																								
									1	1				I	1	1	1	1	I		1				
Report Tier Levels - please sele Tier I - (Results/Default if not spe Tier II - (Results + QC)	ect ecified)	Tier III - (D Tier V - (clie	ata Validatior ent specified)	n Package) 10% 	% Surcharge	$\hat{n}$	MF ME	RL requ DL / PQ	ired Ye	es / No equire	d Yes /	No		EDD r Type:	equire	Ves	/ No				Proje	ct Red	quirements	s (MRLs	s, QAPP)
Relinquished by: (Signature)			245/10	Time:	Received by:	(Signat		k	1		$\mathcal{T}$				Da	2:115	-110	Time:	45	/					
Relinguisher by (Signature)			Date 5/1	s Time 45	Fleceived by:	(Stopat	ture)	N	C	X	1L	h	>		P	15	10	Time:	15	7	Coole	ər / Bla	ank / Ice /	No Ice	
Relinquished by (Signature)	ALL IN	1	Papelsi	U Time 2/	Received by:	Signat	ture)	117	2114	AsV	7.	$\sim$			12	tt:	La	Time	Hr	÷ 1	Temn	eratu	ra S		°C

## Columbia Analytical Services, Inc. Chain of Custody Report

Client: Battelle Project: JPL-GW-1Q10/G005862 Service Request: P1000546

Bottle ID	Tests	Date	Time	Sample Location / User	<b>Disposed On</b>
P1000546-001.01					
	7196A				
		2/15/10	1614	SMO / MZAMORA	
		2/15/10	1615	P-37 / MZAMORA	
		2/15/10	1623	In Lab / SANDERSON	
		2/15/10	1758	P-37 / SANDERSON	
P1000546-002.01					
	7196A				
		2/15/10	1614	SMO / MZAMORA	
		2/15/10	1615	P-37 / MZAMORA	
		2/15/10	1623	In Lab / SANDERSON	
		2/15/10	1758	P-37 / SANDERSON	
P1000546-003.01					
	7196A				
		2/15/10	1614	SMO / MZAMORA	
		2/15/10	1615	P-37 / MZAMORA	
		2/15/10	1623	In Lab / SANDERSON	
		2/15/10	1758	P-37 / SANDERSON	
P1000546-003.02					
		2/15/10	1614	SMO / MZAMORA	
		2/15/10	1615	P-37 / MZAMORA	
		2/15/10	1623	In Lab / SANDERSON	
		2/15/10	1758	P-37 / SANDERSON	

#### Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client:	Battelle		<b>r</b>	<b>F</b>		Work order:	P1000546			
Project:	JPL-GW-1Q1	0 / G005862								
Sample(	(s) received on:	02/15/10		-	Date opened:	02/15/10	by:	MZAN	IORA	
<u>Note:</u> This:	This form is used for all samples received by CAS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of									
compliance	or nonconformity.	Thermal preservation and pH	H will only be eval	luated either at the	request of the clie	ent and/or as required	by the method/SOF	Yes	No	N/A
1	Were sample	containers properly r	narked with c	lient sample II	22			IXI		
2	Container(s) s	upplied by CAS?		nem sample n						
2	Did sample co	<b>ontainers</b> arrive in go	od condition?	,						
3	Was a chain-	f-custody provided?	ou contantion.							
4	Was the chair	-of-custody provided?	completed?							
5	Did comple of	ntoiner labels and/o	r tage agree w	ith custody pa	perc?					
0	Was sample of		t tags agree w	an custouy pa	pers					
/	was sample v	within an original holding	atimon	515 /						
8	Are samples v	vitnin specified noidir	ig times?	of cooler street	simt adhanad	to 9				
9	was proper te	mperature (thermal)	preservation)	or cooler at rec		2	°C			
10	Waa a trin bk	cooler Temperature			remperature	3				
10	was a trip bla	ank received?								
11	Were eveted	upplied by CAS:	aler/Por?				_			
11	vere custody	seals on outside of co	OUCT/DOX ?				Scoling Lid?			
	Location of	sear(s)?	0							
	were signal	ure and date included	<i>!</i>							
	Were seals in	ntact?		0						
	Were custody	seals on outside of sai	nple containe	r?			G 1' I 10			
	Location of	seal(s)?	2				_Sealing Lid?			
	Were signat	ure and date included	?							
	Were seals 1	ntact?		<b>1</b>	1/200	<b>NI</b>				
12	Do containers	have appropriate pre	servation, acc	cording to met	hod/SOP or C	client specified in	aformation?			
	Is there a clie	nt indication that the	submitted san	nples are <b>pH</b> p	reserved?					X
	Were <u>VOA</u> vi	ials checked for prese	nce/absence o	f air bubbles?						X
	Does the clier	nt/method/SOP requir	e that the ana	lyst check the	sample pH an	d <u>if necessary</u> al	ter it?			X
13	Tubes:	Are the tubes cap	ped and intac	t?						X
		Do they contain	moisture?							X
14	Badges:	Are the badges p	roperly cappe	d and intact?						X
		Are dual bed bad	ges separated	and individua	lly capped an	d intact?				X
Lab	Sample ID	Container	Required	Received	Adjusted	VOA Headspace	e Receir	ot / Pres	ervatio	1
		Description	рН *	pH	pH	(Presence/Absence)		Commei	nts	
P1000546	5-001 01	125mL Plastic NP								
P1000546	5-002.01	125mL Plastic NP						and the second	a da anticipa da constructiva por por	

Explain any discrepancies: (include lab sample ID numbers):

125mL Plastic NP

125mL Plastic NP

P1000546-003.01

P1000546-003.02

\* Rcquired pH: Phenols/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS, H2SO4 (pH<2); Metals, HNO3 (pH<2); CN (NaOH or NaOH/Asc Acid) (pH>12); Diss. Sulfide. NaOH (pH>12); T. Sulfide. NaOH/ZnAc (pH>12) RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)  $H_{100}$  Statelle HL GW - 1010 – G00582 - Faget of 1

## **DIVIDER SHEET**

## ANALYTICAL DATA FOR

**Hexavalent Chromium** 

ANALYSIS

Analytical Report

Client : Battelle JPL-GW-1Q10 Project Name : Project Number : G005862 Sample Matrix : WATER

None

Prep Method :

Test Notes :

Analysis Method: 7196A

Service Request: P1000546 **Date Collected :** 02/15/10 **Date Received :** 02/15/10

Chromium, Hexavalent

Units : mg/L (ppm) Basis: NA

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-7	P1000546-001	0.010	0.003	1	NA	02/15/10 17:30	ND	
MW-16	P1000546-002	0.010	0.003	1	NA	02/15/10 17:30	ND	
MW-6	P1000546-003	0.010	0.003	1	NA	02/15/10 17:30	ND	
Method Blank	P1000546-MB	0.010	0.003	1	NA	02/15/10 17:30	ND	

Approved By

Kam Rya Date: \_\_\_\_

2/10/10

9

Report By:SAnderson

#### QA/QC Report

Client: Battelle Project: JPL-GW-1Q10/G005862 **Service Request:** P1000546 **Date Analyzed:** 02/15/10

Title:	Initial and Continuing Calibration Blank (ICB and CCB) Summary
Analyte:	Chromium, Hexavalent
Method:	7196A
Units:	mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB CCB1 CCB2	0.010 0.010 0.010	0.003 0.003 0.003	ND ND ND

Approved By: \_\_\_\_

Kan Pya Date: 2/16/10

#### QA/QC Report

Client: Battelle Project: JPL-GW-1Q10 / G005862 Service Request: P1000546 Date Analyzed: 02/15/10

Title:	Initial and Continuing Calibration Verification (ICV and CCV) Summary
Analyte:	Chromium, Hexavalent
Method:	7196A
Units:	mg/L (ppm)

True		Percent	Acceptance
Value	Result	Recovery	Criteria
0.0579	0.0595	103	90-110
0.0579	0.0584	101	90-110
0.0579	0.0595	103	90-110
	True Value 0.0579 0.0579 0.0579	True         Result           0.0579         0.0595           0.0579         0.0584           0.0579         0.0595	True         Percent           Value         Result         Recovery           0.0579         0.0595         103           0.0579         0.0584         101           0.0579         0.0595         103

Approved By: CCV1A/120594

Kam Rya

QA/QC Report

Client : Project Name : Project Number : Sample Matrix :	Battelle JPL-GW-1Q10 G005862 WATER			Service Date Date Date Date	e Reques Collectee Receivee Extractee Analyzee	t:       P1000         d:       NA         d:       NA         d:       NA         d:       02/15/	546 10	
		Laborat	tory Control Sam Inorganic Param	ble Summary eters				
Sample Name : Lab Code : Test Notes :	Laboratory Control Sample P1000546-LCS				Unit Basi	s: mg/L s: NA	(ppm)	
Analyte		Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexaval	ent	None	7196A	0.0400	0.0413	103	86-114	

Approved By

KAUL PYA Date: 2/11/10

#### QA/QC Report

Client : Battelle Project Name : JPL-GW-1Q10 Project Number : G005862 Sample Matrix : WATER

Service Request : P1000546 **Date Collected :** 02/15/10 **Date Received :** 02/15/10 Date Extracted : NA **Date Analyzed :** 02/15/10

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : Lab Code : Test Notes :	MW-6 P1000546-003MS	P1000546-003DMS	Units : mg/L (ppm) Basis : NA
---	------------------------	-----------------	----------------------------------

	Prep	Analysis		Spike	Level	Sample	Spike	Result	SI Rec	oike overy	CAS Accentance	Relative	Result
Analyte	Method	Method	PQL	MS	DMS	Result	MS	DMS	MS	DMS	Limits	Difference	Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0488	0.0509	98	102	80-120	4	

Approved By

Kam Rya

Date : 2/11/10

13

Report By:SAnderson



#### CAS SR #P1000562

#### **Table of Contents**

Cover Letter	1
Case Narrative	2
Acronym List	3
Sample Cross-Reference	4
Chain of Custody	5
Internal Chains of Custody	6-7
Sample Acceptance Check Form	8-9
Hexavalent Chromium Analytical Data	
Hexavalent Chromium Raw Data	

2655 Park Center Drive, Suite A I Simi Valley, CA 93065 I 805.526.7161

805.526.7270 fax

www.caslab.com

Page 1 of *26* 

#### LABORATORY REPORT

February 17, 2010

olumbia

Analytical Services

David Conner Battelle 3990 Old Town Ave., Suite C-205 San Diego, CA 92110

#### **RE: JPL GW Mon 1Q10 / G486090**

Dear David:

Enclosed are the results of the samples submitted to our laboratory on February 16, 2010. For your reference, these analyses have been assigned our service request number P1000562.

All analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains <u>26</u> pages.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-09-TX; Minnesota Department of Health, Certificate No. 11495AA. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

**Columbia Analytical Services, Inc.** 

The Deverte

Sue Anderson Project Manager

Columbia Analytical Services

2655 Park Center Drive, Suite A I Simi Valle

805 526 7161 | 805 526 7270 fax

Client: Battelle Project: JPL GW Mon 1Q10 / G486090 CAS Project No:

P1000562

www.caslab.com

2

#### CASE NARRATIVE

The samples were received intact under chain of custody on February 16, 2010 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

#### Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for utilization of less than the complete report.

## Columbia Analytical Services, Inc.

#### Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
М	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl tert -Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
թթե	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	Standard Methods for the Examination of Water and Wastewater, 19th Ed., 1995.
SW	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods , SW-846,
	Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)
VOC	Volatile Organic Compound(s)

### Qualifiers

U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
J	The result is an estimated concentration that is less than the MRL (PQL), but greater than or equal to the MDL.
B	Analyte detected in the method blank above MRL (PQL).
E	Estimated; result based on response which exceeded the instrument calibration range.
Ν	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed
D	The reported result is from a dilution.
Х	See case narrative.

#### SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P1000562-001	MW-24-4	2/16/10	08:06
P1000562-002	MW-24-3	2/16/10	08:30
P1000562-003	MW-24-2	2/16/10	08:53
P1000562-004	MW-24-1	2/16/10	09:32
P1000562-005	DUPE-5-1Q10	2/16/10	00:00
P1000562-006	EB-11-02/16/10	2/16/10	09:25
P1000562-007	MW-13	2/16/10	12:50

4



## Water & Soil - Chain of Custody Record & Analytical Service Request

Page \_/\_\_ of \_/\_\_

2655 Park Center Drive, Suite A Simi Valley, California 93065

An Employee - Owned Company	Phone (805) 5 Fax (805) 526	26-7	'161 0		ime in Business Days (Surcharges) please circle %) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day - Standard										CAS Project No. PLOCOS62													
Company Nama & Address (	Deporting Infor	motio	)	Project N	2000				Analysis Method and/or Analytes									CAS	Conta	ict:								
2 A doress (	hepotting inion	natic	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	FIOJECTINA	anie					Preservative Code											Ť	Prese	rvative	Key				
DATIECCE		2	5	JPL	GI	NM	SN	1010											0	Non	ne l							
3990 OLD ISWN	AVE., C	- d	00	Project Nu	umb	er					(þ															1	HCL	-
SAN DIEGO, CA	92110	)		G 41	86	090			ls 🗆		ontracte															2 3	HNC H2S	03 04
Project Manager				P.O. # / Bi	lling	Informat	ion		н G <sup>g</sup>		ed) ubcc	<del>,</del>														4	NaC	ж
DAVID CONA	ER	214319 / BAT			TTE	LE	1 1		ltract □ (S	acteo	(ed)													5	Zn /	Acetate		
Phone F	ax			ATTN: (	TN: GEMALD TOMPKINS			les 🗆	021E	cont 15B	ontra	C/MS tract	ંગ્રે												6	Asc	Acid	
(619) 726-7311				505 COLUM	05 KING AVE. DLUMBUS, 04 43201			C/MS	TBE 8(	□ (Sub vel 80	l (Subc	nics G( Subcon	5/2-)												7	Oth	er	
Email Address for Result Rep	porting	Sa	mpler	(Print & Sig	Print & Sign)			rganics G eoB □ C	8015B 🗆 21B 🗆 M	el 8015B el Low Le	8015M	atile Orgai 270C ⊟ (5	10															
Client Sample ID	Laboratory ID Number	Co	Date llected	Time Collected		Matrix	Nu Cor	nber of ntainers	Volatile O 624 □ 82	TPH Gas BTEX 803	TPH Dies TPH Dies	TPH FC	Semi-Vola 625 🗆 8	J												R	emarks	
MW-24-4		2/1	16/10	806		W		2						$\prec$												Ms/n	ISP	
MW-24-3				830		[		1						$\mathbf{X}$														
MW-24-2				853										$\mathbf{X}$													-	
MW-24-1				932										X														
DUPE-5-1010														Х					ļ							DUPLI	LATE	14
															1		annous constants	ļ							$\vdash$		an a	
EB-11-02/16/10	>	<u> </u>	1	925		-								X					ļ						$\vdash$	EWIP.	BLA	NR
		ļ	ļ		<u> </u>				ļ		ļ		<u> </u>					<u> </u>	<u> </u>						$\vdash$			
Mw-13		-	,	1250		1								X.											$\vdash$			
																									$\vdash$			
		<u> </u>																							$\vdash$			
											-		<u> </u>						<u> </u>				danan yan yan bada		$\vdash$	16-14-14-14-14-14-14-14-14-14-14-14-14-14-		
																									$\vdash$			
Report Tier Levels - please sele Tier I - (Results/Default if not spe Tier II - (Results/+ QC) Relinquished by Stateure)	ct cified)	Tier Tier	III - (D V - (clie	ata Validation ent specified)	Pac	ckage) 10% 	6 Surc	harge	(Signat	M	RL requ	ired Y	require	ed Yes /	No		EDD Type	requ	red Ye	s / No	4.Jim		<u> </u>	Proje	ect Red	quirements	(MRLs,	QAPP)
Relinquished by (Signature)	Gue	K	IN	Date:	D	1433 TIME: 4	06	eceived by:	(Signat	ure)	Ű	Ĥ	-nu	Lee	lm				Pate	6/	Tim	15-	10	Cool	er / Bl	ank / Ice /	No Ice	
Relinquished by: (Signature) Received by: (Signature) Received by: (Signature)					Signature) Date: Tim							ne: Temperature 3 °C																

## Columbia Analytical Services, Inc. Chain of Custody Report

Client:BattelleProject:JPL GW Mon 1Q10/G486090

Service Request: P1000562

Bottle ID	Tests	Date	Time	Sample Location / User	<b>Disposed On</b>
P1000562-001.01					
	7196A				
		2/16/10	1549	SMO / MZAMORA	
		2/16/10	1551	P-37 / MZAMORA	
		2/16/10	1603	In Lab / SANDERSON	
		2/16/10	1744	P-37 / SANDERSON	
P1000562-001.02					
		2/16/10	1549	SMO / MZAMORA	
		2/16/10	1551	P-37 / MZAMORA	
		2/16/10	1603	In Lab / SANDERSON	
		2/16/10	1744	P-37 / SANDERSON	
P1000562-002.01		-			
	7196A				
		2/16/10	1549	SMO / MZAMORA	
		2/16/10	1551	P-37 / MZAMORA	
		2/16/10	1603	In Lab / SANDERSON	
		2/16/10	1744	P-37 / SANDERSON	
P1000562-003.01					
	7196A				
		2/16/10	1549	SMO / MZAMORA	
		2/16/10	1551	P-37 / MZAMORA	
		2/16/10	1603	In Lab / SANDERSON	
		2/16/10	1744	P-37 / SANDERSON	
P1000562-004.01				na 1999 tanàna minina dia kaominina mpikambana amin'ny faritr'o amin'ny faritr'o dia mampiasa amin'ny faritr'o	
11000302 00 1.01	7196A				
		2/16/10	1549	SMO / MZAMORA	
		2/16/10	1551	P-37 / MZAMORA	
		2/16/10	1604	In Lab / SANDERSON	
		2/16/10	1744	P-37 / SANDERSON	
 P1000562-005 01		1799-05-05-5-5-5-5-5-5-5-5-5-5-5-5-5-5-5-5			
1 1000302 003.01	7196A				
		2/16/10	1549	SMO / MZAMORA	
		2/16/10	1551	P-37 / MZAMORA	
		2/16/10	1604	In Lab / SANDERSON	
		2/16/10	1744	P-37 / SANDERSON	
 P1000 <b>562-006 0</b> 1					
1 1000202 000.01	7196A				
		2/16/10	1549	SMO / MZAMORA	
		2/16/10	1551	P-37 / MZAMORA	
		2/16/10	1603	In Lab / SANDERSON	
		2/16/10	1744	P-37 / SANDERSON	
P1000562-007.01					6

Printed 2/17/10 8:39

7196A

### Columbia Analytical Services, Inc. Chain of Custody Report

Client:BattelleProject:JPL GW Mon 1Q10/G486090

Service Request: P1000562

Bottle ID	Tests	Date	Time	Sample Location / User	<b>Disposed On</b>
		2/16/10	1549	SMO / MZAMORA	
		2/16/10	1551	P-37 / MZAMORA	
		2/16/10	1604	In Lab / SANDERSON	
		2/16/10	1744	P-37 / SANDERSON	

#### Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client:	Battelle		Samp	ie neceptanee		Work order:	P1000562						
Project:	JPL GW Mon	1Q10 / G486090											
Sample(	(s) received on:	02/16/10		_	Date opened:	02/16/10	by:	MZAN	IORA				
<u>Note:</u> This:	form is used for <u>all</u>	samples received by CAS.	The use of this for	m for custody seals	is strictly meant	to indicate presence/a	bsence and not as a	n indicatio	on of				
compliance	or nonconformity.	Thermal preservation and pl	H will only be eva	luated either at the	request of the cli	ent and/or as required	l by the method/SOI	). Ves	No	N/A			
	***			lient ermule II	29								
1	were sample	containers properly f	narked with c	ment sample II	)?								
2	Container(s) s	supplied by CAS?	1 1.4.										
3	Did sample containers arrive in good condition?												
4	Was a chain-of-custody provided?												
5	Was the <b>chain-of-custody</b> properly completed?												
6	Did sample c	ontainer labels and/o	r tags agree w	with custody pa	pers?			×					
7	Was sample v	volume received adequ	late for analys	sis?				×					
8	Are samples v	within specified holdir	ng times?					×					
9	Was proper te	emperature (thermal	preservation)	of cooler at rec	eipt adhered	to?		×					
	(	Cooler Temperature	3	°C Blank	Temperature		°C						
10	Was a trip bla	ank received?								$\mathbf{X}$			
	Trip blank s	supplied by CAS:					_						
11	Were custody	seals on outside of co	oler/Box?						X				
	Location of	seal(s)?					Sealing Lid?			X			
	Were signat	ure and date included	?							X			
	Were seals i	ntact?								X			
	Were custody	seals on outside of sam	mple containe	er?					X				
	Location of	seal(s)?					Sealing Lid?			×			
	Were signat	ure and date included	?				_			X			
	Were seals i	ntact?								X			
12	Do containers	have appropriate pre	servation, ac	cording to met	hod/SOP or C	Client specified i	nformation?	X					
	Is there a clie	ent indication that the	submitted sar	nples are <b>pH</b> p	reserved?					X			
	Were VOA v	ials checked for prese	nce/absence c	of air bubbles?						$\mathbf{X}$			
	Does the clier	nt/method/SOP requir	e that the ana	lyst check the	sample pH an	d if necessary a	lter it?			X			
13	Tubes:	Are the tubes cap	ped and intac	t?						X			
10		Do they contain	moisture?							X			
14	Radges.	Are the badges n	roperly cappe	d and intact?									
14	Dauges.	Are dual bed bac	loes senarated	and individua	lly canned an	d intact?							
		Are duar bed bad	iges separated		ny capped an				1				
Lab	Sample ID	Container	Required	Received	Adjusted	VOA Headspac	e Receip	it / Presi	ervation	1			
		Description	իդ	pti	pn	(Presence/Absence		onuner	нs				
P1000562	2-001.01	125mL Plastic NP											
P1000562	2-001.02	125mL Plastic NP											
P1000362	2-002.01	125mL Plastic NP											

Explain any discrepancies: (include lab sample ID numbers):

125mL Plastic NP

125mL Plastic NP

125mL Plastic NP

P1000562-003.01

P1000562-004.01

P1000562-005.01

\*Required pH: Phenols/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS, H2SO4 (pH<2); Metals, HNO3 (pH<2); CN (NaOH or NaOH/Asc Acid) (pH>12); Diss. Sulfide: NaOH (pH>12); T. Sulfide: NaOH/ZnAc (pH>12) Diss. Sulfide: NaOH (pH>12); T. Sulfide: NaOH/ZnAc (pH>12); RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4) d

### Columbia Analytical Services, Inc.

Sample Acceptance Check Form

Client:	Battelle

Project: JPL GW Mon 1Q10 / G486090

Sample(s) received on: 02/16/10

Date opened: 02/16/10

Work order:

by: MZAMORA

P1000562

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1000562-006.01	125mL Plastic NP					
P1000562-007.01	125mL Plastic NP					
		-				

Explain any discrepancies: (include lab sample ID numbers):

9

## **DIVIDER SHEET**

## ANALYTICAL DATA FOR

**Hexavalent Chromium** 

ANALYSIS

Analytical Report

Client : Battelle Project Name : JPL GW Mon 1Q10 Project Number : G486090 Sample Matrix : WATER

Service Request : P1000562 Date Collected : 02/16/10 **Date Received :** 02/16/10

Chromium, Hexavalent

Prep Method : None Analysis Method: 7196A Test Notes :

Units : mg/L (ppm) Basis : NA

				Dilution	Date	Date/Time		Result
Sample Name	Lab Code	PQL	MDL	Factor	Extracted	Analyzed	Result	Notes
MW-24-4	P1000562-001	0.010	0.003	1	NA	02/16/10 17:20	ND	
MW-24-3	P1000562-002	0.010	0.003	1	NA	02/16/10 17:20	ND	
MW-24-2	P1000562-003	0.010	0.003	1	NA	02/16/10 17:20	ND	
MW-24-1	P1000562-004	0.010	0.003	1	NA	02/16/10 17:20	ND	
DUPE-5-1Q10	P1000562-005	0.010	0.003	1	NA	02/16/10 17:20	ND	
EB-11-02/16/10	P1000562-006	0.010	0.003	1	NA	02/16/10 17:20	ND	
MW-13	P1000562-007	0.010	0.003	1	NA	02/16/10 17:20	ND	
Method Blank	P1000562-MB	0.010	0.003	1	NA	02/16/10 17:20	ND	

Approved By

Kall Ryp Date: 2/17/10

11

Report By:SAnderson

#### QA/QC Report

Client:BattelleProject:JPL GW Mon 1Q10 / G486090

**Service Request:** P1000562 **Date Analyzed:** 02/16/10

Title:	Initial and Continuing Calibration Blank (ICB and CCB) Summary
Analyte:	Chromium, Hexavalent
Method:	7196A
Units:	mg/L (ppm)

Sample Name	PQL	MDL	Result		
ICB	0.010	0.003	ND		
CCB1	0.010	0.003	ND		
CCB2	0.010	0.003	ND		

Approved By: \_\_\_\_\_\_\_\_\_

Karen Rya Date: 2/17/10

#### QA/QC Report

Client:BattelleProject:JPL GW Mon 1Q10 / G486090

#### **Service Request:** P1000562 **Date Analyzed:** 02/16/10

Title:	Initial and Continuing Calibration Verification (ICV and CCV) Summary
Analyte:	Chromium, Hexavalent
Method:	7196A
Units:	mg/L (ppm)

True		Percent	Acceptance	
Value	Result	Recovery	Criteria	
0.0579	0.0596	103	90-110	
0.0579	0.0586	101	90-110	
0.0579	0.0596	103	90-110	
	<b>True</b> <b>Value</b> 0.0579 0.0579 0.0579	True         Result           0.0579         0.0596           0.0579         0.0586           0.0579         0.0596	True         Percent           Value         Result         Recovery           0.0579         0.0596         103           0.0579         0.0586         101           0.0579         0.0596         103	

Approved By: CCV1A/120594

Kam Rya

Date: 2/17/10

QA/QC Report

Client :	Battelle	Service Request :	P1000562
Project Name :	JPL GW Mon 1Q10	Date Collected :	NA
Project Number :	G486090	Date Received :	NA
Sample Matrix :	WATER	Date Extracted :	NA
		Date Analyzed :	02/16/10
		Laboratory Control Sample Summary	
		Inorganic Parameters	
Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm

P1000562-LCS

Lab Code :

Units : mg/L (ppm) Basis : NA

Test Notes :							
Analyta	Prep Method	Analysis Method	True Value	Result	Percent	CAS Percent Recovery Acceptance Limits	<b>Result</b>
Analyte	Wiethou	Methou	True value	Result	Recovery	i mito	Rotes
Chromium, Hexavalent	None	7196A	0.0400	0.0416	104	86-114	

Approved By

Kau Ryn Date: 2/17/10

14
#### QA/QC Report

Client :BattelleProject Name :JPL GW Mon 1Q10Project Number :G486090Sample Matrix :WATER

 Service Request :
 P1000562

 Date Collected :
 02/16/10

 Date Received :
 02/16/10

 Date Extracted :
 NA

 Date Analyzed :
 02/16/10

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name :	MW-24-4		Units : mg/L (ppm)
Lab Code :	P1000562-001MS	P1000562-001DMS	Basis: NA
Test Notes :			

	Duon	Analysia		Spile	Loval	Sampla	Spiles	Docult	Sp Rec	oike overv	CAS	Relative	Docult
Analyte	Method	Method	PQL	MS	DMS	Result	MS	DMS	MS	DMS	Acceptance Limits	Percent Difference	Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0437	0.0437	87	87	80-120	<[	

Approved By

Kam Rya

Date : 2/17/10 15



#### CAS SR #P1000579

#### **Table of Contents**

Cover Letter	1
Case Narrative	2
Acronym List	3
Sample Cross-Reference	4
Chain of Custody	5
Internal Chain of Custody	6
Sample Acceptance Check Form	7-8
Hexavalent Chromium Analytical Data	9-14
Hexavalent Chromium Raw Data	15-25



2655 Park Center Drive, Suite A I Simi Valley, CA 93065

805.526.7161 | 805.526.7270 fax

#### www.caslab.com

#### LABORATORY REPORT

February 22, 2010

David Conner Battelle 3990 Old Town Ave., Suite C-205 San Diego, CA 92110

#### **RE: JPL GW Mon 1Q10 / G486090**

Dear David:

Enclosed are the results of the samples submitted to our laboratory on February 17, 2010. For your reference, these analyses have been assigned our service request number P1000579.

All analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains 25 pages.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-09-TX; Minnesota Department of Health, Certificate No. 11495AA. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

**Columbia Analytical Services, Inc.** 

Juderte

Sue Anderson Project Manager

Page 1 of <u>25</u>



2655 Park Center Drive, Suite A

Simi Valley, CA 93065

805 526 7161 L 805 526 7270 fax www.caslab.com

Client: Battelle JPL GW Mon 1Q10 / G486090 Project:

CAS Project No:

P1000579

#### **CASE NARRATIVE**

The samples were received intact under chain of custody on February 17, 2010 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

#### Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for utilization of less than the complete report.

### Columbia Analytical Services, Inc.

#### <u>Acronyms</u>

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
Μ	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl tert -Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
թթե	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	Standard Methods for the Examination of Water and Wastewater, 19th Ed., 1995.
SW	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods , SW-846,
	Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)
VOC	Volatile Organic Compound(s)

#### Qualifiers

U	The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
J	The result is an estimated concentration that is less than the MRL (PQL), but greater than or equal to the MDL.
В	Analyte detected in the method blank above MRL (PQL).
E	Estimated; result based on response which exceeded the instrument calibration range.
Ν	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
D	The reported result is from a dilution.
X	See case narrative.

#### SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P1000579-001	MW-25-5	2/17/10	08:38
P1000579-002	MW-25-4	2/17/10	09:05
P1000579-003	MW-25-3	2/17/10	09:30
P1000579-004	MW-25-2	2/17/10	10:05
P1000579-005	MW-25-1	2/17/10	10:32
P1000579-006	EB-12-2/17/10	2/17/10	10:23



Water & Soil - Chain of Custody Record & Analytical Service Request

Page \_/\_ of \_/\_\_

2655 Park Center Drive, Suite A Simi Valley, California 93065

An Employee - Owned Company	Phone (805) 5 Fax (805) 526	26-7161 -7270		Requested Turnaround Time in Business Days (Surcharges) please circleCAS1 Day (100%)2 Day (75%)3 Day (50%)4 Day (35%)5 Day (25%)10 Day - StandardCAS								CAS Pr	AS Project No. PIOOO579									
			Ductorship			-	r		Analysis Method and/or Analytes							C	CAS Contact:					
Company Name & Address (Reporting Information)					Preservative Code												Pres	ervative Key				
BATIELLE	AJE (-	205	JPL	GW M	N LQIO	<u> </u>				0											0	None
3990 OLY TOWN	Ave., C	,	Project N	t Number			1	(na						T					Τ		1	HCL
SAN SIEGO, CA	92110		G48	G486090																	2	HNO3
Project Manager P.C		P.O. # / Bi	lling Informat	ion	H Gas	(pe														4	NaOH	
DAVID CONNER		214319	BATTE	ELLE	TP	3 C	acted	(pa	$\bigcirc$											5	Zn Acetate	
Phone	Fax		ATTN: (	GERALD T	VE.	tes 🗆	bcont bcont	ontra	C/MS	156											6	Asc Acid
(619) 726. 7311			LOLUL	IBUS, OH	43201	C/MS	BE 8	(Subc	ics G ubcor	1											7	Other
Email Address for Result Re	porting	Sampler	(Print & Sig	In)		ы В С С С С	B M 15B C	15M	ngan □ (Si	Ũ												
						ganic 60B [	8015 1B   801	80	tile C 70C	15												
	Laboratory	Date	Time		Number of		Gas ( 802 Diese	FC	-Vola 82													Remarks
Client Sample ID	ID Number	Collected	Collected	Matrix	Containers	Volati 624 □	TPH	H	Semi- 625 [	0												
Mw-25-5		2/17/10	0838	W	1					X												
MW-25-4	$\mathbb{Q}$		0905							$\boldsymbol{\lambda}$												
Mw-25-3	3		0930							X												
Mw-25-2	Ð		1005		2					X											Msle	152
MW-25-1	(5)		1032		1					$\star$												
						$\downarrow$													$\square$			
FB-12-2/17/1	0 6	1	1023	1	1					$\times$											EQU	P. BLANK
						T			Τ													
· · ·						$\top$		-	+								+		1			
Report Tier Levels - please sel	ect			I	1	+	/		/	)										Project	Requiremen	nts (MRLs, QAPP)
Tier I - (Results/Default if not sp Tier II - (Results + QC)	ecified)	Tier III - (D Tier V - (clie	ata Validation ent specified)	Package) 10%	6 Surcharge	+/	/ MRL re	quired	reguire	ó ed Yes /	No		EDD r Type:	require	d Yes	/ No						
Relinguished by: (Signature)			Date: /	Time	Received by:	(Sidra	tores /	A	T	1					ate	10	Time	50	3			
Relinquished by: (Signature)			2/17/1	0 1503	Received by:	(Signa	ture)	A	n	0100	110	•		9	-7/7 atp://	1.0	Time:	<u>Cu</u>	$\exists$	Cooler	/ Blank / Ice	/ No Ice

Relinquished by: (Signature)

Date:

Received by: (Signature)

Date:

Time:

Temperature 3

°C

## Columbia Analytical Services, Inc. Chain of Custody Report

Client: Battelle Project: JPL GW Mon 1Q10/G486090 Service Request: P1000579

Bottle ID	Tests	Date	Time	Sample Location / User	<b>Disposed On</b>
P1000579-001.01					
	7196A				
		2/17/10	1555	SMO / MZAMORA	
		2/17/10	1555	P-37 / MZAMORA	
		2/17/10	1611	In Lab / SANDERSON	
		2/17/10	1822	P-37 / SANDERSON	
P1000579-002.01					
	7196A				
		2/17/10	1555	SMO / MZAMORA	
		2/17/10	1555	P-37 / MZAMORA	
		2/17/10	1611	In Lab / SANDERSON	
		2/17/10	1822	P-37 / SANDERSON	
P1000579-003.01					
	7196A				
		2/17/10	1555	SMO / MZAMORA	
		2/17/10	1555	P-3// MZAMORA	
		2/17/10	1611	In Lab / SANDERSON	
		2/17/10	1822	P-37 / SANDERSON	
P1000579-004.01					
	7196A	2/17/10	1555	SMO / MZAMODA	
		2/17/10	1555	D 27 / MZAMORA	
		2/17/10	1555	P-5// MZANOKA	
		2/17/10	1011	III Lao / SANDERSON	
		2/1//10	1822	P-5// SAINDERSON	
P1000579-004.02		2/17/10	1555		
		2/17/10	1555	SMO / MZAMORA	
		2/17/10	1555	P-3// MZAMORA	
		2/17/10	1011	IN Lab / SANDERSON P-37 / SANDERSON	
		2/1//10	1022	1-577 SANDERSON	
P1000579-005.01	71064				
	IIJUA	2/17/10	1555	SMO / MZAMORA	
		2/17/10	1555	P-37 / MZAMORA	
		2/17/10	1611	In Lab / SANDERSON	
		2/17/10	1822	P-37 / SANDERSON	
P100 <b>0579-006 0</b> 1					
	7196A				
		2/17/10	1555	SMO / MZAMORA	
		2/17/10	1555	P-37 / MZAMORA	
		2/17/10	1611	In Lab / SANDERSON	
		2/17/10	1822	P-37 / SANDERSON	
	na sector que contrata a manancia de la contra de c				6

### Columbia Analytical Services, Inc.

Sample Acceptance Check Form

Client	: Battelle					Work order:	P1000579			- Designation of the second
Project:	: JPL GW Mon	1 1Q10 / G486090			-					
Sample	(s) received on:	. 02/17/10			Date opened:	: 02/17/10	by:	MZAN	<i>I</i> ORA	
<u>Note:</u> This	, form is used for <u>all</u>	samples received by CAS.	The use of this for	m for custody seals	s is strictly meant	. to indicate presence/	absence and not as ar	n indicatio	on of	
compliance	or nonconformity.	Thermal preservation and pl	H will only be eva!	luated either at the	request of the cliv	ent and/or as require	d by the method/SOP	2. Ves	No	N/A
1	Were sample	containers properly	marked with c	Nient sample []	פח				<u> </u>	
· 2	Container(s)	cumplied by CAS?	Hainey music	Iloni oumpre	):					
2 3	Did sample c	containers arrive in g	ood condition	?				$\mathbf{X}$		
4	Was a chain-	of-custody provided?						X		
5	5 Was the <b>chain-of-custody</b> properly completed?									
6	Did sample c		X							
7	Was sample v	volume received adeq	uate for analys	sis?	r			X		
8	Are samples v	within specified holdi	ng times?					X		
9	Was proper to	emperature (thermal	preservation)	of cooler at rea	ceipt adhered	1 to?		X		
	(	Cooler Temperature		°C Blank '	Temperature	3	°C			
10	Was a trip bl	ank received?								X
	Trip blank s	supplied by CAS:								
11	Were custody	seals on outside of co	oler/Box?						X	
	Location of	seal(s)?					Sealing Lid?			X
	Were signat	ture and date included	1?				-			X
	Were seals i	intact?								X
	Were custody	seals on outside of sa-	mple containe	х?					X	
	Location of	seal(s)?					Sealing Lid?			X
	Were signat	ure and date included	1?							X
	Were seals i	intact?								X
12	Do containers	, have appropriate <b>pre</b>	servation, acc	cording to met!	hod/SOP or C	Client specified i	information?	X		
	Is there a clie	ent indication that the	submitted san	nples are <b>pH</b> p	reserved?					X
	Were <u>VOA v</u>	<u><b>/ials</b></u> checked for prese	nce/absence o	of air bubbles?						X
	Does the clier	nt/method/SOP requir	e that the ana'	lyst check the	sample pH ar	nd <u>if necessary</u> a	lter it?			X
13	Tubes:	Are the tubes cap	ped and intact	t?						X
		Do they contain	moisture?							X
14	Badges:	Are the badges p	properly cappe	d and intact?						X
		Are dual bed bac	lges separated	and individua	lly capped an	nd intact?				X
Lab	Sample ID	Container	Required	Received	Adjusted	VOA Headspar	e Receip	#/Pres	ervatio	1
		Description	i pH »	рН	pH	(Presence/Absence	i i	Sommer	its	
P1000579	9-001.01	125mL Plastic NP	, The second sec			1	T			
P1000579	9-002.01	125mL Plastic NP								
P1000579	э-003.01	125mL Plastic NP								
P1000579	9-004.01	125mL Plastic NP		<u> </u>	ļ!					
P1000579	9-004.02	125mL Plastic NP	, I	1	1 '					1

Explain any discrepancies: (include lab sample ID numbers):

125mL Plastic NP

P1000579-005.01

\*Required pH: Phenols/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS, H2SO4 (pH<2); Metals, HNO3 (pH<2); CN (NaOH or NaOH/Asc Acid) (pH>12);

Diss. Sulfide NaOH (pH>12); T. Sulfide NaOH/ZnAc (pH>12) H000579\_Battelle\_JP1 GW Mon 1010\_G485090 - Page 1 of 2

## Columbia Analytical Services, Inc.

Sample Acceptance Check Form											
Client: Battelle			Work order:	P1000579							
Project: JPL GW Mon	1Q10 / G486090										
Sample(s) received on:	02/17/10	Date o	pened: 02/17/10	by:	MZAMORA						

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1000579-006.01	125mL Plastic NP					
an gun tha an						
an a						
						······
19 2 <sup>- 1</sup> 9 4 - 19 - 19 - 19 - 19 - 19 - 19 - 19 -						
(						
·						
				-		
anne i commune e commune e commune e commune de service						
	n ng pangangang yang pangang pa					

Explain any discrepancies: (include lab sample ID numbers):

# **DIVIDER SHEET**

# ANALYTICAL DATA FOR

**Hexavalent Chromium** 

ANALYSIS

Analytical Report

Battelle Client : Project Name : JPL GW Mon 1Q10 Project Number : G486090 Sample Matrix : WATER

Service Request: P1000579 **Date Collected :** 02/17/10 **Date Received :** 02/17/10

Chromium, Hexavalent

Prep Method : None Analysis Method: 7196A Test Notes :

Units : mg/L (ppm) Basis: NA

				Dilution	Date	Date/Time		Result
Sample Name	Lab Code	PQL	MDL	Factor	Extracted	Analyzed	Result	Notes
MW-25-5	P1000579-001	0.010	0.003	1	NA	02/17/10 17:05	ND	
MW-25-4	P1000579-002	0.010	0.003	1	NA	02/17/10 17:05	ND	
MW-25-3	P1000579-003	0.010	0.003	1	NA	02/17/10 17:05	ND	
MW-25-2	P1000579-004	0.010	0.003	1	NA	02/17/10 17:05	ND	
MW-25-1	P1000579-005	0.010	0.003	1	NA	02/17/10 17:05	ND	
EB-12-2/17/10	P1000579-006	0.010	0.003	1	NA	02/17/10 17:05	ND	
Method Blank	P1000579-MB	0.010	0.003	1	NA	02/17/10 17:05	ND	

Approved By

Karr Rya Date: 2/18/10

-10

#### QA/QC Report

Client: Battelle Project: JPL GW Mon 1Q10 / G486090 **Service Request:** P1000579 **Date Analyzed:** 02/17/10

Title:	Initial and Continuing Calibration Blank (ICB and CCB) Summary
Analyte:	Chromium, Hexavalent
Method:	7196A
Units:	mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB	0.010	0.003	ND
CCB1	0.010	0.003	ND
CCB2	0.010	0.003	ND

Approved By:

ICCBMDL/120594

\_\_\_\_\_\_ 2/18/10 Karen Ryk

#### QA/QC Report

Client:BattelleProject:JPL GW Mon 1Q10 / G486090

#### Service Request: P1000579 Date Analyzed: 02/17/10

Title:	Initial and Continuing Calibration Verification (ICV and CCV) Summary
Analyte:	Chromium, Hexavalent
Method:	7196A
Units:	mg/L (ppm)

Sample Name	True Value	Result	Percent Recovery	Acceptance Criteria
ICV	0.0579	0.0553	96	90-110
CCV1	0.0579	0.0564	97	90-110
CCV2	0.0579	0.0564	97	90-110

Approved By: CCV1A/120594

Karn Rya \_Date: 2/18/10

QA/QC Report

Client :	Battelle			Service	e Reques	t: P1000	579	
Project Name :	JPL GW Mon 1Q10			Date	Collected	d: NA		
Project Number :	G486090			Date	Received	d: NA		
Sample Matrix :	WATER			Date 1	Extracted	d: NA		
-				Date	Analyzeo	<b>d</b> : 02/17/	10	
		Laborat	tory Control Samp Inorganic Paramo	ble Summary eters				
Sample Name : Lab Code : Test Notes :	Laboratory Control Sample P1000579-LCS				Unit Basi	s: mg/L s: NA	(ppm)	
							CAS Percent Recovery	
Analyte		Prep Method	Analysis Method	True Value	Result	Percent Recovery	Acceptance Limits	Result Notes
Chromium, Hexaval	ent	None	7196A	0.0400	0.0387	97	86-114	

Approved By

Kau Rya Date: 2/18/10

-13

#### QA/QC Report

Client : Battelle JPL GW Mon 1Q10 Project Name : Project Number : G486090 Sample Matrix : WATER

Service Request: P1000579 **Date Collected :** 02/17/10 **Date Received :** 02/17/10 **Date Extracted :** NA **Date Analyzed :** 02/17/10

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name :	MW-25-2		Units : mg/L (ppm)
Lab Code :	P1000579-004MS	P1000579-004DMS	Basis: NA
Test Notes :			

	Prep	Analysis		Spike	Level	Sample	Spike	Result	SI Rec	oike overy	CAS	Relative	Result
Analyte	Method	Method	PQL	MS	DMS	Result	MS	DMS	MS	DMS	Limits	Difference	Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0480	0.0491	96	98	80-120	2	

Approved By

Karer Ryh Date: 2/18/10

14



#### CAS SR #P1000580

#### **Table of Contents**

Cover Letter	
Case Narrative	2
Acronym List	
Sample Cross-Reference	
Chain of Custody	5
Internal Chain of Custody	6
Sample Acceptance Check Form	7
Hexavalent Chromium Analytical Data	
Hexavalent Chromium Raw Data	

2655 Park Center Drive, Suite A I Simi Valley, CA 93065 I 805.526.7161

805.526.7270 fax

Page 1 of 24

#### LABORATORY REPORT

February 22, 2010

Columbia

Analvtical Services<sup>™</sup>

David Conner Battelle 3990 Old Town Ave., Suite C-205 San Diego, CA 92110

#### **RE: JPL GW Mon 1Q10 / G486090**

Dear David:

Enclosed are the results of the samples submitted to our laboratory on February 17, 2010. For your reference, these analyses have been assigned our service request number P1000580.

All analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains \_\_\_\_\_pages.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-09-TX; Minnesota Department of Health, Certificate No. 11495AA. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

**Columbia Analytical Services, Inc.** 

e Quelers

Sue Anderson **Project Manager** 



2655 Park Center Drive, Suite A 1

1 Simi Valley, CA 93065

805.526.7161 I 805.526.7270 fax

www.caslab.com

Client:BattelleProject:JPL GW Mon 1Q10 / G486090

CAS Project No:

P1000580

#### CASE NARRATIVE

The samples were received intact under chain of custody on February 17, 2010 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

#### Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for utilization of less than the complete report.

### Columbia Analytical Services, Inc.

#### Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
М	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl tert -Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
թթե	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	Standard Methods for the Examination of Water and Wastewater, 19th Ed., 1995.
SW	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods , SW-846,
	Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TDS	Total Dissolved Solids
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)
VOC	Volatile Organic Compound(s)

#### Qualifiers

The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.
The result is an estimated concentration that is less than the MRL (PQL), but greater than or equal to the MDL.
Analyte detected in the method blank above MRL (PQL).
Estimated; result based on response which exceeded the instrument calibration range.
The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.

- The reported result is from a dilution.
- D X See case narrative.

#### SAMPLE CROSS-REFERENCE

TIME
11:37
12:03
12:08
14:20

4



# 2655 Park Center Drive, Suite A Simi Valley, California 93065

Water & Soil - Chain of Custody Record & Analytical Service Request

Page \_/\_ of \_/\_\_

An Employee - Owned Company	Phone (805) 5 Fax (805) 526	26-7161 -7270	000	Requested 1 Day (1009	Turnaround %) 2 Day (75°	<b>Fime i</b> %) 3 [	<b>n Busi</b> Day (50	i <b>ness D</b> 0%) 4 [	<b>ays (S</b> Day (35	urchar 5%) 5	<b>ges)</b> Day (	<b>please</b> 25%)	e circle 10 Day	e / - Sta	ndard			0	CAS Pro	iect No.	0580
Company Name & Address	(Reporting Inform	nation)	Project Na	ame		-			Anal	ysis M	etho	d and/	or Ana	alytes					CAS Col	ntact:	
BATTELLE 3990 DLD TOWN SAN DLEGD, (	Ave., C- CA 9211	205	JPL Project Nu	GW Mo	N 1610			acted)		0	Pr	eserva	tive Co	de						Prese 0 1 2	ervative Key None HCL HNO3
Project Manager $\overrightarrow{DAVI9}$ $\overrightarrow{OAV}$ Phone (614)726-7311 Email Address for Result R	Fax Pax	Sampler	Р.О. # / Ві 214319 ДПЛ. 5°5 Сэ ∟и (Print & Sig	illing Informat BATT GEVALD LING AV MBUS, OI	ion ELLE TOMPKINS VE 4 43201	ganics GC/MS 60B □ Oxygenates □ TPH Gas □	8015B    11B    MTBE 8021B    14 8015B    (Subcontracted)	el 80155 ⊟ (Subcontracteu) el Low Level 8015B ⊟ (Subcontr ⊟ 8015M (Subcontracted)	ttile Organics GC/MS 270C [] (Subcontracted)	VI (1196)										3 4 5 6 7	H2SO4 NaOH Zn Acetat Asc Acid Other
Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Or 624 🗆 82	BTEX 802	TPH Diese	Semi-Vola 625 □ 82	5										P	lemarks
MW-26-2	$\bigcirc$	2/17/10	1137	W	1					X											
MW-26-1	2		1203	+	+					×											
EB	3									×										Equip	BLANK
Mw-8	3		1208							X											
Mw-1J	Ð		1420							X											
						$\square$															
Report Tier Levels - please se Tier I - (Results Default if not s Tier II - (Results + QC)	pecified)	Tier III - (Da Tier V - (clie	ata Validatior ent specified)	n Package) 10%	6 Surcharge	[] H	MRL MDL	required	Yes / N I require	lo ed Yes /	No	-	EDD ree Type:	quired \	/es / No	D		-	Project I	Requirements	s (MRLs, QAPP)
Relinquished by: (Signature) Relinquished by: (Signature)	Ouu	/	Date Z/1,7/ Date:		Received by: Received by: Received by:	(Signat (Signat) (Signat)	ire ire	Car	<u>III</u>	N q				Date Date	17/10	) Tim Tim Tim	e: e:	35	Cooler /	Blank / Ice /	No Ice

## Columbia Analytical Services, Inc. Chain of Custody Report

Client: Battelle Project: JPL GW Mon 1Q10/G486090 Service Request: P1000580

Bottle ID	Tests	Date	Time	Sample Location / User	<b>Disposed On</b>
P1000580-001.01					
	7196A				
		2/17/10	1603	SMO / MZAMORA	
		2/17/10	1604	P-37 / MZAMORA	
		2/17/10	1611	In Lab / SANDERSON	
		2/17/10	1823	P-37 / SANDERSON	
P1000580-002.01					
	7196A				
		2/17/10	1603	SMO / MZAMORA	
		2/17/10	1604	P-37 / MZAMORA	
		2/17/10	1611	In Lab / SANDERSON	
		2/17/10	1823	P-37 / SANDERSON	
P1000580-003.01					
	7196A				
		2/17/10	1603	SMO / MZAMORA	
		2/17/10	1604	P-37 / MZAMORA	
		2/17/10	1611	In Lab / SANDERSON	
		2/17/10	1823	P-37 / SANDERSON	
P1000580-004.01					
	7196A				
		2/17/10	1603	SMO / MZAMORA	
		2/17/10	1604	P-37 / MZAMORA	
		2/17/10	1611	In Lab / SANDERSON	
		2/17/10	1823	P-37 / SANDERSON	

# Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client:	Battelle			L		Work order:	P1000580			
Project:	JPL GW Mon	. 1Q10 / G486090			-					
Sample(	(s) received on:	02/17/10		-	Date opened:	. 02/17/10	by:	MZAN	<u>/IORA</u>	
<u>Note:</u> This f	form is used for <u>all</u>	samples received by CAS.	The use of this form	m for custody seals	s is strictly meant	to indicate presence/	absence and not as a	n indicatio	on of	
compliance of	or nonconformity.	Thermal preservation and p	H will only be eva	luated either at the	request of the cu	ent and/or as require	d by the method/SOr	Y <u>es</u>	No	N/A
1	Were sample	containers properly	marked with c	client sample IJ	D?			X		
2	Container(s) s	supplied by CAS?		·····				X		
3	Did sample c	ontainers arrive in g	ood condition	?				X		
4	Was a chain-	of-custody provided?	1					X		
5	Was the chair	n-of-custody properly	y completed?					X		
6	Did sample c	ontainer labels and/c	or tags agree w	vith custody pa	ipers?			X		
7	Was sample v	volume received adeq	uate for analy	sis?				$\mathbf{X}$		
8	Are samples v	within specified holdi	ng times?					X		
9	Was proper te	emperature (thermal	preservation)	of cooler at rea	ceipt adhered	to?				X
	(	Cooler Temperature		°C Blank	Temperature	, 	°C			
10	Was a <b>trip bl</b> t	ank received?		•						X
	Trip blank s	supplied by CAS:								
11	Were custody	seals on outside of co	ooler/Box?	_	_		_		X	
	Location of	seal(s)?					Sealing Lid?			X
	Were signat	ure and date included.	1?							X
	Were seals i	.ntact?								$\mathbf{X}$
	Were custody	seals on outside of sa	mple containe	х?					X	
	Location of	seal(s)?					Sealing Lid?			X
	Were signat	ure and date included	1?							X
	Were seals i	.ntact?								X
12	Do containers	have appropriate pre	eservation, acc	cording to met	hod/SOP or C	Client specified j	information?	X		
	Is there a clie	nt indication that the	submitted san	nples are <b>pH</b> p	reserved?					X
	Were <u>VOA v</u>	ials checked for prese	ence/absence o	of air bubbles?						X
	Does the clier	nt/method/SOP requir	re that the ana	lyst check the	sample pH ar	ad <u>if necessary</u> a	lter it?			X
13	Tubes:	Are the tubes car	pped and intac	:t?						X
		Do they contain	moisture?							$\mathbf{X}$
14	Badges:	Are the badges r	properly cappe	d and intact?						X
		Are dual bed bac	dges separated	l and individua	ally capped an	1d intact?				X
Lab :	Sample ID	Container	Required	Received	Adjusted	VOA Headspar	.e Receip	ot / Pres	ervation	,
		Description	pH *	pH /	pH	(Presence/Absence	a   / /	Commer	ats	
P1000580	)-001.01	125mL Plastic NP	1		line in the second seco	T	T			
P100 <b>0580</b>	)-002.01	125mL Plastic NP								
21000580	)-003.01	125mL Plastic NP	· · · · · ·							
21000580	)-004.01	125mL Plastic NP	'	!						

Explain any discrepancies: (include lab sample ID numbers):

\*Required pH: Phenols/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS, H2SO4 (pH<2); Metals, HNO3 (pH<2); CN (NaOH or NaOH/Asc Acid) (pH>12); Diss. Sulfide Steph (nH212); T Sulfide NaQHZnAc (pH>12); RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

# **DIVIDER SHEET**

# ANALYTICAL DATA FOR

**Hexavalent Chromium** 

ANALYSIS

Analytical Report

Battelle Client : Project Name : JPL GW Mon 1Q10 Project Number: G486090 Sample Matrix : WATER

Service Request: P1000580 **Date Collected :** 02/17/10 **Date Received :** 02/17/10

Chromium, Hexavalent

Prep Method : None Analysis Method: 7196A Test Notes :

Units : mg/L (ppm) Basis: NA

9

				Dilution	Date	Date/Time		Result
Sample Name	Lab Code	PQL	MDL	Factor	Extracted	Analyzed	Result	Notes
MW-26-2	P1000580-001	0.010	0.003	1	NA	02/17/10 17:05	ND	
MW-26-1	P1000580-002	0.010	0.003	1	NA	02/17/10 17:05	ND	
MW-8	P1000580-003	0.010	0.003	1	NA	02/17/10 17:05	ND	
MW-10	P1000580-004	0.010	0.003	1	NA	02/17/10 17:05	ND	
Method Blank	P1000580-MB	0.010	0.003	1	NA	02/17/10 17:05	ND	

Approved By

Kaun Ryan Date: 2/18/10

Report By:SAnderson

#### QA/QC Report

Client:BattelleProject:JPL GW Mon 1Q10 / G486090

**Service Request:** P1000580 **Date Analyzed:** 02/17/10

Title:	Initial and Continuing Calibration Blank (ICB and CCB) Summary
Analyte:	Chromium, Hexavalent
Method:	7196A
Units:	mg/L (ppm)

Karen Rya

Sample Name	PQL	MDL	Result
ICB CCB1 CCB2	0.010 0.010 0.010	0.003 0.003 0.003	ND ND ND

Approved By: ICCBMDL/120594

#### QA/QC Report

Client:	Battelle
Project:	JPL GW Mon 1Q10 / G486090

Service Request: P1000580 Date Analyzed: 02/17/10

Title:	Initial and Continuing Calibration Blank (ICB and CCB) Summary
Analyte:	Chromium, Hexavalent
Method:	7196A
Units:	mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB	0.010	0.003	ND
CCB1	0.010	0.003	ND
CCB2	0.010	0.003	ND

Approved By: \_\_\_\_\_

Date: 2/15/10 Kar Rya.

#### QA/QC Report

Client :	Battelle			Service	e Reques	t: P1000	580	
Project Name :	JPL GW Mon 1Q10			Date	Collecte	d: NA		
Project Number :	G486090			Date	Receive	d: NA		
Sample Matrix :	WATER			Date 1	Extracte	d: NA		
-				Date	Analyze	<b>d</b> : 02/17/	/10	
		Laborat	ory Control Samp Inorganic Paramo	eters				
Sample Name : Lab Code : Test Notes :	Laboratory Control Sample P1000580-LCS				Unit Basi	ts: mg/L is: NA	(ppm)	
							CAS Percent Recovery	
Analyte		Prep Method	Analysis Method	True Value	Result	Percent Recovery	Acceptance Limits	Result Notes
Chromium, Hexaval	ent	None	7196A	0.0400	0.0387	97	86-114	

Approved By

Kau Rya Date: 2/18/10

12

QA/QC Report

Client : Battelle Project Name : JPL GW Mon 1Q10 Project Number : G486090 Sample Matrix : WATER

Service Request : P1000580 **Date Collected :** 02/17/10 **Date Received :** 02/17/10 Date Extracted : NA **Date Analyzed :** 02/17/10

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name :	MW-26-2		Units: mg/L (ppm)
Lab Code :	P1000580-001MS	P1000580-001DMS	Basis: NA
Test Notes :			

	Prep	Analysis		Spike	Level	Sample	Spike	Result	Sp Rec	oike overy	CAS	Relative	Result
Analyte	Method	Method	PQL	MS	DMS	Result	MS	DMS	MS	DMS	Limits	Difference	Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0460	0.0460	92	92	80-120	<1	

Approved By

Karen Rya Date: 2/18/10

13



#### CAS SR #P1000597

#### Table of Contents

Cover Letter	1
Case Narrative	2
Acronym List	3
Sample Cross-Reference	
Chain of Custody	5
Internal Chain of Custody	
Sample Acceptance Check Form	7
Hexavalent Chromium Analytical Data	
Hexavalent Chromium Raw Data	

Columbia nalvtical Services

2655 Park Center Drive, Suite A

Simi Valley, CA 93065

805 526 7161 805 526 7270 fax www.caslab.com

#### LABORATORY REPORT

February 22, 2010

David Conner Battelle 3990 Old Town Ave., Suite C-205 San Diego, CA 92110

#### **RE: JPL-GW-1Q10 / G005862/JPL GWM**

Dear David:

Enclosed are the results of the samples submitted to our laboratory on February 18, 2010. For your reference, these analyses have been assigned our service request number P1000597.

All analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.caslab.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains <u>2</u> pages.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP), Certificate No. L10-3; Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-09-TX; Minnesota Department of Health, Certificate No. 11495AA. Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact me for information corresponding to a particular certification.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

**Columbia Analytical Services, Inc.** 

Juderte

Sue Anderson Project Manager

Page 1 of 23



2655 Park Center Drive, Suite A I Simi Valley, CA 93065 I 805.526.7161

6.7161 I 805.526.7270 fax

www.caslab.com

Client: Battelle Project: JPL-GW-1Q10 / G005862/JPL GWM CAS Project No:

P1000597

#### CASE NARRATIVE

The samples were received intact under chain of custody on February 18, 2010 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

#### Hexavalent Chromium by EPA Method 7196A

No anomalies were encountered during this analysis.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for utilization of less than the complete report.

#### **Columbia Analytical Services, Inc.**

#### Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
Μ	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl tert -Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
թթե	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
SM	Standard Methods for the Examination of Water and Wastewater , 19th Ed., 1995.
SW	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods , SW-846,
	Third Edition, 1986 and as amended by Updates I, II, IIA, and IIB.
TDS	Total Dissolved Solids
ТРН	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
TTLC	Total Threshold Limit Concentration
VOA	Volatile Organic Analyte(s)
VOC	Volatile Organic Compound(s)

#### <u>Qualifiers</u>

U The compound was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL.

- J The result is an estimated concentration that is less than the MRL (PQL), but greater than or equal to the MDL.
- **B** Analyte detected in the method blank above MRL (PQL).
- E Estimated; result based on response which exceeded the instrument calibration range.
- N The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
- **D** The reported result is from a dilution.
- X See case narrative.

Client:BattelleProject:JPL-GW-1Q10/G005862/JPL GWM

#### SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P1000597-001	MW-5	2/18/10	11:19
P1000597-002	DUPE-6-1Q10	2/18/10	11:19
P1000597-003	MW-15	2/18/10	14:16
P1000597-004	DUPE-7-1Q10	2/18/10	14:16



2655 Park Center Drive, Suite A Simi Valley, California 93065 Phone (805) 526-7161

Water &	k Soil	<ul> <li>Chain of</li> </ul>	Custody	Record &	Analytical	Service Reques	t Page of

An Employee - Owned Company         Phone (805) 526-7161 Fax (805) 526-7270         Requested Turnaround T 1 Day (100%) 2 Day (75%)							Time in Business Days (Surcharges) please circlei%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day - Standard										CAS	CAS Project No.					
							Analysis Method and/or Analytes												CAS	CAS Contact:			
Company Name & Address (Reporting Information) Pro				Project Name			Preservative Code													Preservative Key			
505 King AVI	0		JPL-	<u>6W-1</u>	Q10						3									$\square$	0	None	
Columbus, OH	GODS862 KUI LINU				tracted)	tracted)													2	HNO3			
Project Manager	P.O. # / Billing Information					tcted) (Subcor	ted)	E C	Y								-		3 4 5	NaOH			
Phone	Fax		ATTN: Jerry Tompkins				3021B [	bcontra bcontra 015B	contrac	aC/MS intracted	X								6			Asc Acid	
619-726-7311	614-458-	6641	Columbus OH 43201				MTBE	3 □ (Si evel 8	duS) M	anics (Subco	He										Other		
connerd & b	attelle, org	Sampler	(Fille & Sig	JII)		rganics (	8015B [ 21B []	el 8015E el Low L	80151	atile Orga 270C [] (	0												
Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile O 624 🗆 82	TPH Gas BTEX 80	TPH Dies TPH Dies	TPH FC	Semi-Vola 625 🗆 8	114										R	emarks	
MW-7 21191	D	2/18/10	1119	AQ	IP						$\leq$												
DUPE-6-1216		2/18/0	1119	AQ	jp					$\geq$	$\leq$												
MW-15	0	2/18/10	1416	AQ	IP					<u>&gt;</u>	$\leq$						<u> </u>						
DUPE-7-1QIC	2 (7)	2/18/10	1416	AR	IP	ļ					$\leq$	_								$\left  \right $			
			ļ			ļ							_										
				<u> </u>							$\rightarrow$	$\rightarrow$								+	- Companies and the Contract of the State of		
				ļ																			
												_					<u> </u>			+			
											+				+					+			
											+					+				+-+			
		+											_			+				+			
											$\rightarrow$				+			-		+			
							$\left  \right $							_						+	ing the terminal state and interviewer as reactions on		
																				+			
Report Tier Levels - please set	lect					I										 A			Pro	ject Re	quirements	(MRLs, QAPP)	
Tier I - (Results/Default if not sp Tier II - (Results + QC)	becified)	Tier III - (D Tier V - (clie	ata Validatior ent specified)	n Package) 10	% Surcharge 🔎	<u> </u>	MR MD	IL requi IL / PQI	red Ye L / J re	es / No	Yes / N	lo	El Ty	DD requ pe:	uire Ye	8 / No							
Relinquished by: (Signature)	ut de		Date: 8/1	10 Time: 150	Received by:	(Signat	ture)	>	TA		4. 0			2	Date:	XI		0:170	0	oler / B	ank / Ice / I		
0	2		V/IX	10 70	5 1 1		/	0	١¥.	ATL	MAN	I V		l	191	510	2 1	356					

Received by: (Signature)

Date:

Time:

Temperature H <sup>O</sup>C

°C

Date:

Time:

Relinquished by: (Signature)
# Columbia Analytical Services, Inc. Chain of Custody Report

Client: Battelle

Project: JPL-GW-1Q10/G005862/JPL GWM

Service Request: P1000597

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P1000597-001.01					
	7196A				
		2/18/10	1553	SMO / MZAMORA	
		2/18/10	1557	P-37 / MZAMORA	
		2/18/10	1647	In Lab / SANDERSON	
		2/18/10	1753	P-37 / SANDERSON	
P1000597-002.01			-		
	7196A				
		2/18/10	1553	SMO / MZAMORA	
		2/18/10	1557	P-37 / MZAMORA	
		2/18/10	1647	In Lab / SANDERSON	
		2/18/10	1753	P-37 / SANDERSON	
P1000597-003.01		······································			
	7196A				
		2/18/10	1553	SMO / MZAMORA	
		2/18/10	1557	P-37 / MZAMORA	
		2/18/10	1647	In Lab / SANDERSON	
		2/18/10	1753	P-37 / SANDERSON	
P1000597-004.01					
	7196A				
		2/18/10	1553	SMO / MZAMORA	
		2/18/10	1557	P-37 / MZAMORA	
		2/18/10	1647	In Lab / SANDERSON	
		2/18/10	1753	P-37 / SANDERSON	

.

#### Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client	t: Battelle		Jumpi	. Merepuinter	Oncer i or	Work order:	P1000597					
Project	t: JPL-GW-1Q10	) / G005862/JPL GW	М									
Sample	e(s) received on:	02/18/10		]	Date opened:	02/18/10	by:	by: MZAMORA				
<u>Note:</u> This	s form is used for <u>all</u> s	samples received by CAS. 7	The use of this form	for custody seals	is strictly meant t	to indicate presence/al	bsence and not as a	n indicati	on of			
compliance	e or nonconformity. T	Thermal preservation and pI	H will only be evalu	ated either at the	request of the clie	ent and/or as required	by the method/SOF	). Ves	No	N/A		
1	Were sample	containers properly a	marked with cli	ient sample II	)?							
2	Container(s) s	upplied by CAS?		on sample				X				
3	Did sample co	ontainers arrive in go	ood condition?					X				
4	Was a chain-o	of-custody provided?						X				
5	Was the chain	-of-custody properly	completed?					X				
6	Did sample co	ontainer labels and/c	or tags agree wit	th custody pay	pers?				X			
7	Was sample v	olume received adeq	uate for analysi	s?				X				
8	Are samples w	<i>i</i> thin specified holdir	ng times?					X				
9	Was proper te	mperature (thermal	preservation) of	f cooler at rec	eipt adhered	to?		X				
	C	ooler Temperature		°C Blank	Femperature	4	°C					
10	Was a trip bla	ink received?								X		
	Trip blank s	upplied by CAS:										
11	Were custody	seals on outside of co	ooler/Box?						X			
	Location of s	seal(s)?					Sealing Lid?			X		
	Were signate	are and date included	?							X		
	Were seals in	ntact?								X		
	Were custody	seals on outside of sa	mple container'	?					X			
	Location of s	seal(s)?					Sealing Lid?			X		
	Were signate	ure and date included	?							X		
	Were seals in	ntact?								X		
12	Do containers	have appropriate pre	servation, acco	ording to meth	10d/SOP or C	lient specified in	nformation?	X				
	Is there a clier	nt indication that the	submitted samp	ples are <b>pH</b> p	reserved?					X		
	Were <u>VOA vi</u>	als checked for prese	ence/absence of	air bubbles?						X		
	Does the clien	it/method/SOP requir	e that the analy	yst check the	sample pH an	d if necessary al	ter it?			X		
13	Tubes:	Are the tubes cap	ped and intact?	?						X		
		Do they contain	moisture?							X		
14	Badges:	Are the badges p	roperly capped	and intact?						X		
		Are dual bed bac	lges separated a	and individua	lly capped an	d intact?				X		
Lab	Sample ID	Container	Required	Received	Adjusted	VOA Headspace	Receir	ot / Pres	ervatio	1		
		Boomintion			nU	· •		Comorana	n.t			

Cao Minipic ID	Description	рН *	pH	pH	(Presence/Absence)	Comments
P1000597-001.01	125mL Plastic NP					
P1000597-002.01	125mL Plastic NP					
P1000597-003.01	125mL Plastic NP					
P1000597-004.01	125mL Plastic NP					

Explain any discrepancies: (include lab sample ID numbers):

Sample -001 is listed as MW-7 on the COC but MW-5 on the bottle label. Per client bottle tag is correct.

\*Required pH: Phenols/COD/NH3/TOC/TOX/NO3+NO2/TKN/T.PHOS, H2SO4 (pH<2); Metals, HNO3 (pH<2); CN (NaOH or NaOH/Asc Acid) (pH>12);

Diss. Sulfide NaOH (nH>12); T. Sulfide NaOHZnAc (nH>12) H000597\_Battelle\_JFL-GW-1Q10\_G005862\_JFL GWM - Page 1 of 1

# **DIVIDER SHEET**

# ANALYTICAL DATA FOR

**Hexavalent Chromium** 

ANALYSIS

Analytical Report

Client : Battelle Project Name : JPL-GW-1Q10 Project Number : G005862/JPL GWM Sample Matrix : WATER Service Request : P1000597 Date Collected : 02/18/10 Date Received : 02/18/10

Chromium, Hexavalent

Prep Method : None Analysis Method : 7196A Test Notes : Units : mg/L (ppm) Basis : NA

9

			Dilution	Date	Date/Time		Result
Lab Code	PQL	MDL	Factor	Extracted	Analyzed	Result	Notes
P1000597-001	0.010	0.003	1	NA	02/18/10 17:20	ND	
P1000597-002	0.010	0.003	1	NA	02/18/10 17:20	ND	
P1000597-003	0.010	0.003	1	NA	02/18/10 17:20	ND	
P1000597-004	0.010	0.003	1	NA	02/18/10 17:20	ND	
P1000597-MB	0.010	0.003	1	NA	02/18/10 17:20	ND	
	Lab Code P1000597-001 P1000597-002 P1000597-003 P1000597-004 P1000597-MB	Lab CodePQLP1000597-0010.010P1000597-0020.010P1000597-0030.010P1000597-0040.010P1000597-MB0.010	Lab CodePQLMDLP1000597-0010.0100.003P1000597-0020.0100.003P1000597-0030.0100.003P1000597-0040.0100.003P1000597-MB0.0100.003	DilutionLab CodePQLMDLFactorP1000597-0010.0100.0031P1000597-0020.0100.0031P1000597-0030.0100.0031P1000597-0040.0100.0031P1000597-MB0.0100.0031	Dilution Date   Lab Code PQL MDL Factor Extracted   P1000597-001 0.010 0.003 1 NA   P1000597-002 0.010 0.003 1 NA   P1000597-003 0.010 0.003 1 NA   P1000597-004 0.010 0.003 1 NA   P1000597-MB 0.010 0.003 1 NA	DilutionDateDate/TimeLab CodePQLMDLFactorExtractedAnalyzedP1000597-0010.0100.0031NA02/18/10 17:20P1000597-0020.0100.0031NA02/18/10 17:20P1000597-0030.0100.0031NA02/18/10 17:20P1000597-0040.0100.0031NA02/18/10 17:20P1000597-MB0.0100.0031NA02/18/10 17:20	Dilution Date Date/Time   Lab Code PQL MDL Factor Extracted Analyzed Result   P1000597-001 0.010 0.003 1 NA 02/18/10 17:20 ND   P1000597-002 0.010 0.003 1 NA 02/18/10 17:20 ND   P1000597-003 0.010 0.003 1 NA 02/18/10 17:20 ND   P1000597-004 0.010 0.003 1 NA 02/18/10 17:20 ND   P1000597-MB 0.010 0.003 1 NA 02/18/10 17:20 ND

Approved By

Kare Rya

Report By:SAnderson

#### QA/QC Report

Client:BattelleProject:JPL-GW-1Q10 / G005862 / JPL GWM

**Service Request:** P1000597 **Date Analyzed:** 02/18/10

Title:	Initial and Continuing Calibration Blank (ICB and CCB) Summary
Analyte:	Chromium, Hexavalent
Method:	7196A
Units:	mg/L (ppm)

Sample Name	PQL	MDL	Result
ICB	0.010	0.003	ND
CCB1	0.010	0.003	ND

Approved By: ICCBMDL/120594

Kam Rya

\_\_\_\_\_\_Date: \_\_\_\_\_\_\_2/19/10

#### QA/QC Report

Client:BattelleProject:JPL-GW-1Q10 / G005862 / JPL GWM

#### **Service Request:** P1000597 **Date Analyzed:** 02/18/10

Title:	Initial and Continuing Calibration Verification (ICV and CCV) Summary
Analyte:	Chromium, Hexavalent
Method:	7196A
Units:	mg/L (ppm)

Sample Name	True Value	Result	Percent Recovery	Acceptance Criteria
ICV	0.0579	0.0573	99	90-110
CCV1	0.0579	0.0573	99	90-110

Approved By: CCV1A/120594

Kam Rya

Date: 2/19/10

#### QA/QC Report

Client :	Battelle			Servic	e Reques	st: P1000	597	
Project Name :	JPL-GW-1Q10			Date	Collecte	d: NA		
Project Number :	G005862/JPL GWM			Date	Receive	d: NA		
Sample Matrix :	WATER			Date 1	Extracte	d: NA		
				Date	Analyze	<b>d</b> : 02/18/	10	
		Laborat	ory Control Samj Inorganic Param	ble Summary eters				
Sample Name : Lab Code : Test Notes :	Laboratory Control Sample P1000597-LCS				Unit Basi	ts: mg/L is: NA	(ppm)	
							CAS Percent Recovery	
Analyte		Prep Method	Analysis Method	True Value	Result	Percent Recovery	Acceptance Limits	Result Notes
Chromium Hexaval	ent	None	7196A	0.0400	0.0400	100	86-114	

Approved By

Kann Rya Date: 2/19/10

12

#### QA/QC Report

Client : Battelle JPL-GW-1Q10 Project Name : Project Number: G005862/JPL GWM Sample Matrix : WATER

Service Request: P1000597 **Date Collected :** 02/18/10 **Date Received :** 02/18/10 Date Extracted : NA **Date Analyzed :** 02/18/10

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name :	MW-5		Units : mg/L (ppm)
Lab Code :	P1000597-001MS	P1000597-001DMS	Basis: NA
Test Notes :			

	Prep	Analysis		Spike	Level	Sample	Spike	Result	SJ Rec	oike overy	CAS	Relative	Result
Analyte	Method	Method PQ	PQL	MS	DMS	Result	MS	DMS	MS	DMS	Limits	Difference Note	Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0481	0.0481	96	96	80-120	<1	

Approved By

Karen Rya Date: 2/19/10

13