

LABORATORY REPORT

February 4, 2009

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

RE: JPL Groundwater Monitoring 1Q09 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on February 3, 2009. For your reference, these analyses have been assigned our service request number P0900363.

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 2^{2} 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; Department of the Navy (NFESC); Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-08-TX. 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.

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Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson Project Manager

> Page 1 of 🕉

2655 Park Center Drive, Suite A

Simi Valley, California 93065

(805) 526-7161

(805) 526-7270 fax



Client:

Battelle

CAS Project No:

P0900363

Project:

JPL Groundwater Monitoring 1Q09 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on February 3, 2009 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.

Client: Battelle Service Request: P0900363

Project: JPL Groundwater Monitoring 1Q09/G486090

SAMPLE CROSS-REFERENCE

<u>SAMPLE #</u>	CLIENT SAMPLE ID	<u>DATE</u>	<u>TIME</u>
P0900363-001	MW-12-3	2/3/09	10:05
P0900363-002	MW-12-2	2/3/09	10:33
P0900363-003	MW-12-1	2/3/09	11:01
P0900363-004	EB-08-02/03/09	2/3/09	10:20

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

ICIon ChromatographyICBInitial Calibration BlankICVInitial Calibration VerificationLCSLaboratory Control SampleLUFTLeaking 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 Billionppm 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.

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.

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

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Page /

2655 Park Center Drive, Suite A Columbia Analytical

Simi Valley, California 93065 Phone (805) 526-7161

Zn Acetate FOUR BLONE Asc Acid OC LOCI IN CAS Project No. Preservative Key H2S04 HN03 NaOH Other 礻 Remarks CAS Contact 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 Analysis Method and/or Analytes Preservative Code Semi-Volatile Organics GC/MS 625 \(\text{B270C}\) (Subcontracted) TPH FC □ 8015M (Subcontracted) TPH Diesel Low Level 8015B

(Subcontracted) TPH Diesel 8015B 🗆 (Subcontracted) BTEX 8021B 🗆 MT8E 8021B 🗇 Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ BITH SCHOLD TOMPKINS 505 KING DUE Number of Containers Project Number 6 Lambers, OH 43201 H Matrix 0609867 Project Name Sampler (Print & Sign) Soc1 Collected 1033 0701 101 Date Collected Company Name & Address (Reporting Information) 3990 OLD TOWN AVE. C-205 Fax (805) 526-7270 Laboratory ID Number SAN DIECO, CA 92110 I Email Address for Result Reporting Fax DAVID CONNER EB-08-04/31 1154-727-69 An Employee - Owned Company BATTELLE MW-12-2 Project Manager MW-12-1 Client Sample ID アースと

Project Requirements (MRLs, QAPP) Cooler //Blank //Ice / No Ice Temperature Time: 3 is Time: 102 1202 1203 EDD required Yes / No Type: Mamas MRL required Yes /No MDL/ PQL / J required Yes / No Received by: (Signature) Réceived by: (Signature) Received by: (Signature) Tier III - (Data Validation Package) 10% Surcharge Tier V - (client specified) Det 169 Time:55 Tier 1 - (Results/Default if not specified) Report Tier Levels - please select Relinquished by: (Signature) Relinquished by: (Signature) Tier II - (Results + QC)

Columbia Analytical Services, Inc. Chain of Custody Report

Client: Battelle Service Request: P0900363

Project: JPL Groundwater Monitoring 1Q09/G486090

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0900363-001.01					
	7196A				
		2/3/09	1314	SMO / MZAMORA	
		2/3/09	1315	P-37 / MZAMORA	
		2/3/09	1321	In Lab / NFALLAHI	
		2/3/09	1506	P-37 / NFALLAHI	
P0900363-002.01					
	7196A				
		2/3/09	1314	SMO / MZAMORA	
		2/3/09	1315	P-37 / MZAMORA	
		2/3/09	1320	In Lab / NFALLAHI	
		2/3/09	1506	P-37 / NFALLAHI	
P0900363-003.01				.,	
	7196A				
		2/3/09	1314	SMO / MZAMORA	
		2/3/09	1315	P-37 / MZAMORA	
		2/3/09	1320	In Lab / NFALLAHI	
		2/3/09	1506	P-37 / NFALLAHI	
P0900363-004.01					
	7196A				
		2/3/09	1314	SMO / MZAMORA	
		2/3/09	1315	P-37 / MZAMORA	
		2/3/09	1321	In Lab / NFALLAHI	
		2/3/09	1506	P-37 / NFALLAHI	

Columbia Analytical Services, Inc. Sample Acceptance Check Form

	Battelle		•	•	_	Work order:	P0900363			
-		vater Monitoring 1Q09	9 / G486090							
-	s) received on			-	Date opened:		by:	MZAN		
		Il samples received by CAS 7. Thermal preservation an				-			indicatio	n of
compilance	of noncomorning	7. Thermai preservation and	a pri wiii oliiy be	evaruated either a	it the request or t	ne chem and/or as re	equired by the meth	Yes	<u>No</u>	N/A
1	Were sample	containers properly	marked with cl	ient sample II) ?			\times		
2	Container(s)	supplied by CAS?						\times		
3	Did sample c	containers arrive in go	ood condition?					\times		
4	Was a chain-	of-custody provided?						\times		
5	Was the chair	n-of-custody properly	completed?					\times		
6	Did sample c	container labels and/o	r tags agree wi	ith custody par	pers?			\times		
7	Was sample	volume received adeq	uate for analys	sis?				\boxtimes		
8	Are samples v	within specified holding	ng times?					\boxtimes		
9	Was proper to	emperature (thermal	preservation) o	of cooler at rec	eipt adhered	to?		\times		
	(Cooler Temperature		°C Blank	Temperature	2	°C			
10	Was a trip bl	ank received?		•			_		\times	
	Trip blank s	supplied by CAS:					_			
11	Were custody	y seals on outside of c	ooler/Box?						X	
	Location of	seal(s)?					_Sealing Lid?			\times
	Were signat	ture and date included	?							\times
	Were seals i	intact?								\times
	Were custody	seals on outside of sa	imple container	r?					\times	
	Location of	seal(s)?					_Sealing Lid?			X
	Were signat	ture and date included	?							\boxtimes
	Were seals i	intact?								\times
12	Do containers	have appropriate pro	eservation, acc	ording to metl	hod/SOP or C	Client specified in	nformation?			\times
	Is there a clie	ent indication that the	submitted samp	ples are pH p	reserved?					\times
	Were VOA v	vials checked for prese	ence/absence of	f air bubbles?						\times
	Does the clie	nt/method/SOP requir	e that the analy	st check the s	ample pH and	d <u>if necessary</u> al	ter it?			\times
13	Tubes:	Are the tubes cap	ped and intact	?						\times
		Do they contain r	noisture?							\times
14	Badges:	Are the badges p	properly capped	and intact?						\times
		Are dual bed bad	ges separated a	ınd individuall	ly capped and	intact?				\times
Lab	Sample ID	Container	Required	Received	Adjusted	VOA Headspace	e Recein	t / Pres	ervation	
		Description	pH *	рН	рH	(Presence/Absence)		ommer		
P0900363	-001.01	125mL Plastic NP								
P0900363		125mL Plastic NP								
20900363		125mL Plastic NP								
20900363	-004.01	125mL Plastic NP								
Explain a	ny discrenancies	s: (include lab sample ID	numbers).		<u></u>		1		*****	
	, ameropanoles	(

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

Analytical Report

Client: Battelle

Service Request: P0900363

Project Name:

JPL Groundwater Monitoring 1Q09

Date Collected: 02/03/09

Project Number: G486090 Sample Matrix: WATER Date Received: 02/03/09

Chromium, Hexavalent

Prep Method: None Analysis Method: 7196A Units: mg/L (ppm)

Basis: NA

Test Notes:

				Dilution	Date	Date/Time		Result
Sample Name	Lab Code	PQL	MDL	Factor	Extracted	Analyzed	Result	Notes
MW-12-3	P0900363-001	0.010	0.006	1	NA	02/03/09 14:40	ND	
MW-12-2	P0900363-002	0.010	0.006	1	NA	02/03/09 14:40	ND	
MW-12-1	P0900363-003	0.010	0.006	1	NA	02/03/09 14:40	ND	
EB-08-02/03/09	P0900363-004	0.010	0.006	1	NA	02/03/09 14:40	ND	
Method Blank	P0900363-MB	0.010	0.006	1	NA	02/03/09 14:40	ND	

approved By Sue Jule By Date:

Date: 2/4/09

QA/QC Report

Client: Battelle Service Request: P0900363

Project: JPL Groundwater Monitoring 1Q09 / G486090 Date Analyzed: 02/03/09

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	0.006	ND
CCB1	0.010	0.006	ND

Sul Duders

Approved By: ICCBMDL/120594

Date:

QA/QC Report

Client: Project:

Battelle

JPL Groundwater Monitoring 1Q09 / G486090

Service Request: P0900363

Date Analyzed: 02/03/09

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
ICV	0.0418	0.0403	96
CCV1	0.0418	0.0413	99

Approved By:

CCV1A/120594

Ine Jules 109

QA/QC Report

Client: Battelle Service Request: P0900363

Project Name :JPL Groundwater Monitoring 1Q09Date Collected :NAProject Number :G486090Date Received :NASample Matrix :WATERDate Extracted :NADate Analyzed :02/03/09

Laboratory Control Sample Summary Inorganic Parameters

Sample Name: Laboratory Control Sample Units: mg/L (ppm)

Lab Code: P0900363-LCS Basis: NA

Test Notes:

CAS Percent Recovery Acceptance Percent Result Analysis Prep Limits Notes Method True Value Result Recovery Method Analyte 98 0.0400 0.0392 92-113 None 7196A Chromium, Hexavalent

Date

42

QA/QC Report

Client: Battelle

Project Name:

JPL Groundwater Monitoring 1Q09

Date Collected: 02/03/09 Date Received: 02/03/09

Project Number: G486090 Sample Matrix: WATER

Date Extracted: NA

Date Analyzed: 02/03/09

Service Request: P0900363

Matrix Spike/Duplicate Matrix Spike Summary

P0900363-001DMS

Sample Name: MW-12-3

Units: mg/L (ppm)

Lab Code: P0900363-001MS

Basis: NA

Test Notes:

Analyte	Prep Method	Analysis Method	PQL	Spike MS	Level DMS	Sample Result	Spike MS	Result DMS	Rec	oike overy DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0529	0.0529	106	106	82-114	<1	

Approved By

he Cheleste

43



CAS SR #P0900382

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LABORATORY REPORT

February 6, 2009

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

RE: JPL Groundwater Monitoring 1Q09 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on February 4, 2009. For your reference, these analyses have been assigned our service request number P0900382.

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; Department of the Navy (NFESC); Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-08-TX. 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.

Sne Judern

Sue Anderson Project Manager

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2655 Park Center Drive, Suite A

Simi Valley, California 93065

(805) 526-7161

(805) 526-7270 fax



Client:

Battelle

CAS Project No:

P0900382

Project:

JPL Groundwater Monitoring 1Q09 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on February 4, 2009 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.

Client: Battelle Service Request: P0900382

Project: JPL Groundwater Monitoring 1Q09/G486090

SAMPLE CROSS-REFERENCE

SAMPLE #	<u>CLIENT SAMPLE ID</u>	<u>DATE</u>	<u>TIME</u>
P0900382-001	MW-3-4	2/4/09	09:34
P0900382-002	MW-3-3	2/4/09	10:01
P0900382-003	MW-3-2	2/4/09	10:42
P0900382-004	DUPE-5-1Q09	2/4/09	00:00
P0900382-005	MW-4-3	2/4/09	07:26
P0900382-006	MW-4-2	2/4/09	07:46
P0900382-007	MW-4-1	2/4/09	08:12
P0900382-008	EB-09-02/04/09	2/4/09	08:02

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

ICIon ChromatographyICBInitial Calibration BlankICVInitial Calibration VerificationLCSLaboratory Control SampleLUFTLeaking Underground Fuel Tank

MModified MethodMDLMethod Detection LimitMRLMethod 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 Billionppm 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.

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.

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

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Columbia Analytical Sorvices Mc.	2655 Park Center Drive, Suite A Simi Valley, California 93065	ite A 55								
An Employee - Owned Company	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	ime in Bus 6) 3 Day (5	iness Day 0%) 4 Day	s (Surcharg 7 (35%) 5 Da	ss) please ci ay (25%) 10 l	cle Jay - Standard	CAS Project No.	oct No.	Ç*
								CAS Contact:	act:	
Company Name & Address	Company Name & Address (Reporting Information) Project Name	Project Name		,	Anaiysis Mei	Analysis Method and/or Analytes	nalytes			
DATE:	12000	S. S				Preservative Code	Code		Preservative Key	_
200 OF DW	いいいいになる。	390 OLD DWN TIC. CM, STC GW MON 1009			0				0 None	
	01125	Project Number		(pə					1 HCL	
SON MESO, OF NOS		101000		ract					2 HNO3	
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110 0115	7		Project Number	nber			(p) - [H
1500 AERO, CA 1410	2 2 2		/ //6//				.scte						N	HNO3
	M(0100045	2] se	ļuo	(е	H2S04
Project Manager			P.O. # / Billing Information	ng Informati	티			\overline{Z}					4	NaOH
LAND CONNEI			THE TOMPKIN	200 6	MPKIND	□ 8	scte	P (bet	·····				5	Zn Acetate
Phone			405 h	BING AUR	`) ,,	setes	contr	ntrac					9	Asc Acid
619-726-7311					1028/ 401	.BE 8	qns)	Docodi						Other
Email Address for Result Reporting	ing	Sampler (Sampler (Print & Sign)			012B□ 012B□ D	M2108	<u>.t∩</u> 18) □ 202	***************************************					
Client Sample ID	Laboratory ID Number	Date Collected	Time	Matrix	Number of Containers	Volatile Org 624 □ 428 8 APT BTEX 8021 1929 HqT	TPH FC TPH FC	- /)					Re	Remarks
MW-3-4/	•	2/4/2	2/1/20	3	4			X						
MW-3-3	()				4			X						
MW-3-2	5		7401	magazinin caru) ee	7			X					M5/M5D	<u> </u>
DUPE-5-1009	X				7			X					DUPLICATE	3/2
MW-4-3			926%					X					Couragies	20 AT 0126
MW-4-2	N.		346	Sales and the sa				X						
MW-4-1	2		218					X						
EB-09-02/24/09	.*		70%	-				X					Eou	. BLAUC
				70.00										
Report Tier Levels - please select Tier I - (Results/Default if not specified) Tier II - (Results + QC)		ier III - (Dat	Tier III - (Data Validation Package) 10% Surcharge Tier V - (client specified)	ackage) 10%	Surcharge	MBL ra	MRL required Yes (No MDL / PQL / J required	ON Serin	EDC	EDD required Yes No	ino Starte		Project Requirements (MRLs, QAPP)	MRLs, QAPP)
Relinquished by: (Signature) Relinquish to be respectively (Signature)			Date: 14/05	Time 3/	Received by: (Signature) Received by: (Signature)	Signature))		Date: 1	Time:	Cooler	or Riank //fre / No fre	9
Dokument Frod by Office		7)	9 5	(,)	()	7			100	25/	1000		2

Columbia Analytical Services, Inc. Chain of Custody Report

Client: Project: Battelle

JPL Groundwater Monitoring 1Q09/G486090

Service Request: P0900382

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0900382-001.01					
	7196A	2/4/00	1202		
		2/4/09 2/4/09	1323 1332	SMO / LKUKITA In Lab / NFALLAHI	
		2/4/09	1653	P-37 / NFALLAHI	
		27 11 0 2	***************************************	1 3, 1 11111111111111111111111111111111	
P0900382-002.01	7196A				
	/190A	2/4/09	1323	SMO / LKUKITA	
		2/4/09	1332	In Lab / NFALLAHI	
		2/4/09	1654	P-37 / NFALLAHI	
P0900382-003.01					
	7196A				
		2/4/09	1323	SMO / LKUKITA	
		2/4/09	1332	In Lab / NFALLAHI	
		2/4/09	1653	P-37 / NFALLAHI	
P0900382-003.02					
		2/4/09	1324	SMO / LKUKITA	
		2/4/09	1332	In Lab / NFALLAHI	
		2/4/09	1653	P-37 / NFALLAHI	
P0900382-004.01					
	7196A				
		2/4/09	1323	SMO / LKUKITA	
		2/4/09 2/4/09	1332 1654	In Lab / NFALLAHI P-37 / NFALLAHI	
		2/1/09	1031		
P0900382-005.01	7196A				
	/190A	2/4/09	1323	SMO / LKUKITA	
		2/4/09	1332	In Lab / NFALLAHI	
		2/4/09	1653	P-37 / NFALLAHI	
P0900382-006.01					
2 0 0 0 0 0 0 0 0 1	7196A				
		2/4/09	1323	SMO / LKUKITA	
		2/4/09	1332	In Lab / NFALLAHI	
		2/4/09	1653	P-37 / NFALLAHI	
P0900382-007.01					
	7196A				
		2/4/09	1323	SMO / LKUKITA	
		2/4/09	1332	In Lab / NFALLAHI	
		2/4/09	1653	P-37 / NFALLAHI	
P0900382-008.01					
	7196A		4465		6
		2/4/09	1323	SMO / LKUKITA	6

Columbia Analytical Services, Inc. Chain of Custody Report

Client:

Battelle

Service Request: P0900382

Project:

JPL Groundwater Monitoring 1Q09/G486090

Tests	Date	Time	Sample Location / User	Disposed On
	2/4/09	1332	In Lab / NFALLAHI	
	2/4/09	1653	P-37 / NFALLAHI	
	Tests	2/4/09	2/4/09 1332	2/4/09 1332 In Lab / NFALLAHI

Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client:	Battelle		Samp	e Acceptance	CHECK POIL	Work order:	P0900382			
-		ater Monitoring 1Q09	/ G486090							
-	(s) received on:			-	Date opened:		·	LKUK		
		samples received by CAS.							on of	
compliance	or nonconformity.	Thermal preservation and pl	H will only be eval	uated either at the	request of the cli	ent and/or as required	by the method/SOP	Yes	No	<u>N/A</u>
1	Were sample	containers properly r	narked with c	lient sample II) ?			X		
2	Container(s)	supplied by CAS?		•				X		
3	Did sample c	ontainers arrive in go	od condition?					X		
4	Was a chain-	of-custody provided?						\times		
5	Was the chair	n-of-custody properly	completed?					X		
6	Did sample c	ontainer labels and/o	r tags agree w	ith custody pa	pers?			X		
7		volume received adequ		• -	•			×		
8	_	within specified holdin	-					×		
9	Was proper to	emperature (thermal	preservation)	of cooler at rec	ceipt adhered	to?		\boxtimes		
		Cooler Temperature	· /		Temperature		°C		_	
10		ank received?		•	1		_		\boxtimes	
	_	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	?							X
	Were seals	intact?								X
	Were custody	seals on outside of sar	mple containe	r?					\times	
	Location of		1				Sealing Lid?			X
		ure and date included	?	-						×
	Were seals i									\boxtimes
12		have appropriate pre	servation, acc	ording to met	hod/SOP or C	Client specified in	formation?	<u> </u>		
		ent indication that the		_						\boxtimes
		ials checked for prese			reserved.					\mathbf{X}
		nt/method/SOP requir			complo pH on	d if nonggomy olt	- m i+9			X
13	Tubes:	Are the tubes cap			sampie pri an	id <u>ii necessary</u> an	er it?			\boxtimes
13	Tubes.	-	_	· .						
1.4	Dadman	Do they contain to		1 1 ! 4 40						\boxtimes
14	Badges:	Are the badges p			111	1:				X
		Are dual bed bad		and individua	ny capped an	d intact?				X
Lab :	Sample ID	Container Description	Required pH *	Received	Adjusted	VOA Headspace				1
D0000000	1.001.01		law.	pH	pH	(Presence/Absence)	•	ommei	us.	
P0900382 P0900382		125mL Plastic NP								
P0900382		125mL Plastic NP 125mL Plastic NP								
P0900382		125mL Plastic NP								
20900382	2-004.01	125mL Plastic NP								
20900382	2-005.01	125mL Plastic NP								
Explain a	ny discrenancies	: (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); CN (NaOH or NaOH or NaOH/Asc Acid) (pH>12); CN (NaOH or NaOH or NaOH/Asc Acid) (pH>12); CN (NaOH or NaOH or

Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client: Battelle	Work order:	P0900382		
Project: JPL Groundwater Monitoring 1Q09 / G486090				
Sample(s) received on: 2/4/09	Date opened: 2/4/09	bv:	LKUKITA	

Lab Sample ID	Container	Required	Received	Adjusted	VOA Headspace	Desiré / Desseudi
isau sampie ii)	Description	pH *	pH	pH	(Presence/Absence)	Receipt / Preservation Comments
P0900382-006.01	125mL Plastic NP					
P0900382-007.01	125mL Plastic NP					
P0900382-008.01	125mL Plastic NP					
2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	1201113114640111					
						-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1

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

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

Analytical Report

Client: Battelle

Service Request: P0900382

Project Name: JPL Groundwater Monitoring 1Q09
Project Number: G486090

Date Collected: 02/04/09 **Date Received:** 02/04/09

Sample Matrix: WATER

Chromium, Hexavalent

Prep Method: None

Units: mg/L (ppm)

Analysis Method: 7196A

Basis: NA

Test Notes:

				Dilution	Date	Date/Time		Result
Sample Name	Lab Code	PQL	MDL	Factor	Extracted	Analyzed	Result	Notes
MW-3-4	P0900382-001	0.010	0.006	1	NA	02/04/09 15:30	ND	
MW-3-3	P0900382-002	0.010	0.006	1	NA	02/04/09 15:30	ND	
MW-3-2	P0900382-003	0.010	0.006	1	NA	02/04/09 15:30	ND	
DUPE-5-1Q09	P0900382-004	0.010	0.006	1	NA	02/04/09 15:30	ND	
MW-4-3	P0900382-005	0.010	0.006	1	NA	02/04/09 15:30	ND	
MW-4-2	P0900382-006	0.010	0.006	1	NA	02/04/09 15:30	ND	
MW-4-1	P0900382-007	0.010	0.006	1	NA	02/04/09 15:30	ND	
EB-09-02/04/09	P0900382-008	0.010	0.006	1	NA	02/04/09 15:30	ND	
Method Blank	P0900382-MB	0.010	0.006	1	NA	02/04/09 15:30	ND	

Approved By She Aulesta Date: 2/6/09 1

Report By:NFallahi

QA/QC Report

Client: Project:

Battelle

JPL Groundwater Monitoring 1Q09 / G486090

Service Request: P0900382

Date Analyzed: 02/04/09

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	0.006	ND
CCB1	0.010	0.006	ND
CCB2	0.010	0.006	ND

Ine Julerson

Approved By:

ICCBMDL/120594

Date

QA/QC Report

Client:BattelleService Request:P0900382Project:JPL Groundwater Monitoring 1Q09 / G486090Date Analyzed:02/04/09

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
ICV	0.0418	0.0418	100
CCV1	0.0418	0.0418	103
CCV2	0.0418	0.0418	100

Ine Queers

Approved By:

CCV1A/120594

Date:

QA/QC Report

Client: Battelle Service Request: P0900382

Project Name :JPL Groundwater Monitoring 1Q09Date Collected :NAProject Number :G486090Date Received :NASample Matrix :WATERDate Extracted :NADate Analyzed :02/04/09

Laboratory Control Sample Summary Inorganic Parameters

Sample Name: Laboratory Control Sample Units: mg/L (ppm)

Lab Code: P0900382-LCS Basis: NA

Test Notes:

CAS Percent Recovery Percent Acceptance Prep Analysis Result Limits Method Method True Value Result Recovery Notes Analyte Chromium, Hexavalent None 7196A 0.0400 0.0397 99 92-113

Approved By Sul Sul M Date: 2/6/9 14

Report By:NFallahi

QA/QC Report

Client:

Battelle

Project Name:

JPL Groundwater Monitoring 1Q09

Project Number: G486090 Sample Matrix:

WATER

Service Request: P0900382

Date Collected: 02/04/09

Date Received: 02/04/09

Date Extracted: NA

Date Analyzed: 02/04/09

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name:

MW-3-2

Lab Code:

P0900382-003MS

P0900382-003DMS

Units: mg/L (ppm)

Basis: NA

Test Notes:

	Prep	Analysis		Spike	Level	Sample	Spike	Result		oike overy	CAS Acceptance	Relative Percent	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	0.0533	0.0533	107	107	82-114	<1	

ne Judeste Date:



CAS SR #P0900415

Table of Contents

Cover Letter	
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Sample Cross-Reference	3
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Internal Chain of Custody	6
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Heyayalent Chromium Raw Data	15-25



LABORATORY REPORT

February 6, 2009

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

RE: JPL Groundwater Monitoring 1Q09 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on February 5, 2009. For your reference, these analyses have been assigned our service request number P0900415.

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; Department of the Navy (NFESC); Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-08-TX. 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.

Juderen

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson Project Manager

2655 Park Center Drive, Suite A

Simi Valley, California 93065

(805) 526-7161

(805) 526-7270 fax



Client:

Battelle

CAS Project No:

P0900415

Project:

JPL Groundwater Monitoring 1Q09 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on February 5, 2009 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.

Client: Battelle Service Request: P0900415

Project: JPL Groundwater Monitoring 1Q09/G486090

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	<u>DATE</u>	<u>TIME</u>
P0900415-001	MW-22-3	2/5/09	07:58
P0900415-002	MW-22-2	2/5/09	08:25
P0900415-003	MW-22-1	2/5/09	08:54
P0900415-004	MW-11-3	2/5/09	10:43
P0900415-005	MW-11-2	2/5/09	11:08
P0900415-006	MW-11-1	2/5/09	11:56
P0900415-007	EB-10-02/05/09	2/5/09	08:42

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

DMSDuplicate Matrix SpikeDOH or DHSDepartment of Health ServicesEPAU.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

ppbParts Per BillionppmParts 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.

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.

Page 1 of

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

2655 Park Center Drive, Suite A Simi Valley, California 93065 Dhone (805) 526-2161

An Employee - Owned Company Fa	Phone (805) 526-7161 Fax (805) 526-7270	26-7161 -7270	<u> </u>	Requested To Day (100%)	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	ime in Bus 6) 3 Day (5)	iness I	Days (Sur Day (35%	charge 5 5 Day	s) please ci	narges) please circle 5 Day (25%) 10 Day - Standard	ס	CASP	CAS Project No.		
								Analys	sis Meth	Analysis Method and/or Analytes	Analytes		CAS Contact	ontact:		
≥ \$	porting Inform	nation)	Project Name	ЭС				`								
として		K	19	()	2		F		-	Preservative	Code			Prese	Preservative Key	
2990 OLD TOWN AVE, C-LD)	10, CV	3	Project Num	Project Number	ğ		(p		7					> -	HC H	:
SAN THELD (A 92110	97110		1 316.1	ç			scte.							. 0	HNO3	
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<u>—</u>			P.O. # / Billin	P.O. # / Billing Information	<u>_لر</u>		Supc		96					4	NaOH	
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Phone Fax	~		S LANGE	1 1) X X		168 (8910	C/W						တ ၊	Asc Acid	
1151-727-1311			*	40,	0	.BE 8)8 lə	os e) =					_	Other	
Email Address for Result Reporting	ting	Sampler	Sampler (Print & Sign)			08□ O× 012B□ 0	гом гел		M							
Client Sample ID	Laboratory ID Number	Date Collected	Time	Matrix	Number of Containers	TPH Gas 8 BTEX 8021	IeseiG H9T IeseiG H9T	TPH FC □ Semi-Volati	7					ď	Remarks	
MU-22-3		45/2	8510	3	7	-			×							
MW-22-2		_	0825	_					×							
MW-22-1	*	-	2580						\times							
MW-11-3	Ķ		1043						×							
Mw-11-2	description		8011						X							
MW-11-	(j)		121						×							
52-10-01/05/0g	general de		Z180						K					Emis	WIN BLONK	¥
				•												
									-							
Report Tier Levels - please select													Projec	Project Requirements (MRLs, QAPP)	(MRLs. QAPP)	
Tier I - (Results/Default if not specified)	M	Tier III - (D. Ter V - (clie	Tier III - (Data Validation Package) 10% Surcharge	ackage) 10% (Surcharge	- MRL MDL	require / PQL/	MRL required Yes / No MDL / PQL / J required Yes	Yes		EDD required Yes ANO Type:	Troport	7	,		
Relinquished by: (Signature)	K		20205/s	105 Pmil 2017	Received by: (Signature)	Signature)	/		5	٤	Date: 3	Time:	N AND AND AND AND AND AND AND AND AND AN			
Relinquished of (Signature)			Page 1	Time:	Received by: (Signature)	Signature			5		Date	Time	Coole)	Cooley / Blank / Ice	No Ice	
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Columbia Analytical Services, Inc. Chain of Custody Report

Client: Project: Battelle

JPL Groundwater Monitoring 1Q09/G486090

Service Request: P0900415

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0900415-001.01					
	7196A				
		2/5/09	1420	SMO / LKUKITA	
		2/5/09	1440	In Lab / SANDERSON	
		2/5/09	1643	P-37 / LKUKITA	
P0900415-002.01					
	7196A				
		2/5/09	1420	SMO / LKUKITA	
		2/5/09	1440	In Lab / SANDERSON	
		2/5/09	1643	P-37 / LKUKITA	
P0900415-003.01					
	7196A				
		2/5/09	1420	SMO / LKUKITA	
		2/5/09	1440	In Lab / SANDERSON	
		2/5/09	1643	P-37 / LKUKITA	
P0900415-004.01					
	7196A				
		2/5/09	1420	SMO / LKUKITA	
		2/5/09	1440	In Lab / SANDERSON	
		2/5/09	1643	P-37 / LKUKITA	
P0900415-005.01					
	7196A				
		2/5/09	1420	SMO / LKUKITA	
		2/5/09	1440	In Lab / SANDERSON	
		2/5/09	1644	P-37 / LKUKITA	
P0900415-006.01				and the Military and the second control of t	
	7196A				
		2/5/09	1420	SMO / LKUKITA	
		2/5/09	1440	In Lab / SANDERSON	
		2/5/09	1643	P-37 / LKUKITA	
P0900415-007.01					
_ :, ::::::::::::::::::::::::::::::::::	7196A				
		2/5/09	1420	SMO / LKUKITA	
		2/5/09	1440	In Lab / SANDERSON	
		2/5/09	1644	P-37 / LKUKITA	

Columbia Analytical Services, Inc. Sample Acceptance Check Form

	Battelle			F		Work order:	P0900415			
-		ater Monitoring 1Q09	7 / G486090						4	
-	s) received on:	*			Date opened:			LKUK		
		samples received by CAS.							on of	
compliance	or nonconformity.	Thermal preservation and pl	H will only be evalu	ated either at the	request of the cli	ent and/or as required	d by the method/SOP	Yes	<u>No</u>	N/A
1	Were sample	containers properly	narked with cli	ent sample II) ?			\boxtimes		
2	_	supplied by CAS?						\boxtimes		
3		ontainers arrive in go	ood condition?					\boxtimes		
4		of-custody provided?						X		
5		n-of-custody properly	completed?					×		
6		ontainer labels and/c	-	th custody na	ners?			\boxtimes		
7	_	volume received adequ		• • •	JO18.			\boxtimes		
8	_	within specified holding	-					×		
9	-	emperature (thermal	_	f cooler at rec	eint adhered	to?		\mathbf{X}		
		Cooler Temperature			Femperature		°C	نتنا		
10	Was a trip bla	-		C Diank	remperature		_ `		X	
10	-	supplied by CAS:							,	ليا
11	-	seals on outside of co	ooler/Box?				_		X	
**	Location of		ocier, Box.				Sealing Lid?			\boxtimes
		ure and date included	7				Scannig End:			X
	Were seals i		•							\mathbf{X}
		seals on outside of sa	mnle container	7					\boxtimes	
	Location of		inpro container	•			Sealing Lid?			\boxtimes
		ure and date included	2				_Scanng Lid?			X
	Were seals i		: :							\mathbf{X}
12		have appropriate pre	servation acco	ording to metl	nod/SOP or (Tient specified i	nformation?	\boxtimes		
12		ant indication that the		_		znem speemed i	mormation:			\boxtimes
		ials checked for prese	•		reserved?					
					1 77	1.0				\boxtimes
10		nt/method/SOP requir	-		sample pH ar	nd <u>if necessary</u> a	Iter it?			X
13	Tubes:	Are the tubes cap	•	,						X
		Do they contain								X
14	Badges:	Are the badges p								X
		Are dual bed bac	lges separated a	ınd individua	lly capped an	nd intact?				\boxtimes
Lab	sample ID	Container	Required	Received	Adjusted	VOA Headspac	e Receip	t / Pres	ervation	1
		Description	pH *	pH	pH	(Presence/Absence		ommer	ıts	
P0900415		125mL Plastic NP								
P0900415		125mL Plastic NP								
P0900415		125mL Plastic NP								
P0900415 P0900415		125mL Plastic NP					-			
P0900415		125mL Plastic NP 125mL Plastic NP								
		:: (include lab sample II	numbers):				<u> </u>		WW	
-	-									

^{*}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 (NaO

Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client:	Battelle	Work order:	P0900415		
Project:	JPL Groundwater Monitoring 1Q09 / G486090				
Sample(s) received on: 2/5/09	Date opened: 2/5/09	bv:	LKUKITA	

Lab Sample ID	Container	Required	Received	Adjusted	VOA Headspace	Receipt / Preservation
anne Constitute 44	Description	pH *	pH	pH	Presence/Absence)	
P0900415-007.01	125mL Plastic NP					
			-			
				,		
					- 	

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

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

Analytical Report

Client: Battelle

Service Request: P0900415

Project Name: JPL Groundwater Monitoring 1Q09

Date Collected: 02/05/09

Project Number: G486090 **Sample Matrix:** WATER

Date Received: 02/05/09

Chromium, Hexavalent

Prep Method: None

Units: mg/L (ppm)

Basis: NA

Analysis Method: 7196A

Test Notes:

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
Sumple Hume	200 0000	~ ~~				•		
MW-22-3	P0900415-001	0.010	0.006	1	NA	02/05/09 15:50	ND	
MW-22-2	P0900415-002	0.010	0.006	1	NA	02/05/09 15:50	ND	
MW-22-1	P0900415-003	0.010	0.006	1	NA	02/05/09 15:50	ND	
MW-11-3	P0900415-004	0.010	0.006	1	NA	02/05/09 15:50	ND	
MW-11-2	P0900415-005	0.010	0.006	1	NA	02/05/09 15:50	ND	
MW-11-1	P0900415-006	0.010	0.006	1	NA	02/05/09 15:50	ND	
EB-10-02/05/09	P0900415-007	0.010	0.006	1	NA	02/05/09 15:50	ND	
Method Blank	P0900415-MB	0.010	0.006	1	NA	02/05/09 15:50	ND	

Approved Ry

Date

10

QA/QC Report

Client: Battelle Service Request: P0900415

Pariests Pariests Polymore Maniering 1000 / C486000

Pariests Polymore Polym

Project: JPL Groundwater Monitoring 1Q09 / G486090 Date Analyzed: 02/05/09

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	0.006	ND
CCB1	0.010	0.006	ND
CCB2	0.010	0.006	ND

ne Juleste

Approved By:

ICCBMDL/120594

11

QA/QC Report

Client: Project:

Battelle

JPL Groundwater Monitoring 1Q09 / G486090

Service Request: P0900415

Date Analyzed: 02/05/09

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
ICV	0.0418	0.0403	96
CCV1	0.0418	0.0392	94
CCV2	0.0418	0.0392	94

The Julesto

Approved By:

CV1A/120594

12

QA/QC Report

Client:

Battelle

JPL Groundwater Monitoring 1Q09

Service Request:

P0900415

Project Name: Project Number: Sample Matrix:

G486090 WATER

Date Collected: Date Received:

NA NA

NA

Date Extracted: Date Analyzed: 02/05/09

Laboratory Control Sample Summary **Inorganic Parameters**

Sample Name:

Laboratory Control Sample

Units: mg/L (ppm)

Lab Code:

P0900415-LCS

Basis: NA

Test Notes:

						CAS		
						Percent		
						Recovery		
Analyte	Prep Method	Analysis Method	True Value	Result		Acceptance Limits	Result Notes	
Chromium, Hexavalent	None	7196A	0.0400	0.0382	96	92-113		

QA/QC Report

Battelle Client:

Project Name: JPL Groundwater Monitoring 1Q09

Project Number: G486090 Sample Matrix: WATER

Service Request: P0900415 **Date Collected:** 02/05/09 **Date Received:** 02/05/09 Date Extracted: NA Date Analyzed: 02/05/09

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name:

MW-22-3

P0900415-001MS

P0900415-001DMS

Units: mg/L (ppm)

Basis: NA

Lab Code: Test Notes:

Analyte	Prep Method	Analysis Method	PQL	Spike MS	Level DMS	Sample Result	Spike MS	Result DMS	Rec	oike overy DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0494	0.0484	99	97	82-114	2	

Chelerk



CAS SR #P0900459

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LABORATORY REPORT

February 10, 2009

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

RE: JPL Groundwater Monitoring 1Q09 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on February 9, 2009. For your reference, these analyses have been assigned our service request number P0900459.

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; Department of the Navy (NFESC); Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-08-TX. 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.

Cullera

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson Project Manager

Page 1 of <u>25</u>

2655 Park Center Drive, Suite A

Simi Valley, California 93065

(805) 526-7161

(805) 526-7270 fax



Client:

Battelle

CAS Project No:

P0900459

Project:

JPL Groundwater Monitoring 1Q09 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on February 9, 2009 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.

Client: Battelle Service Request: P0900459

Project: JPL Groundwater Monitoring 1Q09/G486090

SAMPLE CROSS-REFERENCE

SAMPLE#	CLIENT SAMPLE ID	DATE	<u>TIME</u>
P0900459-001	MW-23-4	2/9/09	08:25
P0900459-002	MW-23-3	2/9/09	08:58
P0900459-003	MW-23-2	2/9/09	09:59
P0900459-004	MW-23-1	2/9/09	10:41
P0900459-005	EB-11-02/09/09	2/9/09	10:20
P0900459-006	SB-01-1Q09	2/9/09	10:25

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

DMSDuplicate Matrix SpikeDOH or DHSDepartment of Health Services

EPA U.S. Environmental Protection Agency

GC Gas Chromatography

GC/MS Gas Chromatography/Mass Spectrometry

ICIon ChromatographyICBInitial Calibration BlankICVInitial Calibration VerificationLCSLaboratory Control SampleLUFTLeaking Underground Fuel Tank

MModified MethodMDLMethod Detection LimitMRLMethod 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 Billionppm 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.

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.

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

Columbia Analytical Services MC

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

814 Zn Acetate SUICE GRANK Asc Acid Project Requirements (MRLs, QAPP) H2S04 Preservative Key NaOH HN03 덪 Remarks BUINGA DA 25/X2 N က 4 5 9 7 CAS Project No. CAS Contact EDD required Yes Mo 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 Analysis Method and/or Analytes Preservative Code MRL required Yes (No MDL / PDV-3/equired 8270C

(Subcontracted) Semi-Volatile Organics GC/MS TPH FC 🗆 8015M (Subcontracted) Low Level 8015B

(Subcontracted) TPH Gas 8015B □ BTEX 8021B □ MTBE 8021B □ 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas ☐ Received by Gun Volatile Organics GC/MS Number of Containers ATTN: GERBLED TOMPKINS Tier III - (Data Validation Package) 10% Surcharge PC GLU MON 1909 Project Number 22 OH 4320 505 KING AVE. 2143/9/BATTELLE Matrix 020034-7 2 Project Name Sampler (Print & Sign) Tier V - (client specified) 4805 Date Time Collected Collected 0858 0201 9959 1401 220 160/cd 3990 OLD TOWN AUE, C-205 Company Name & Address (Reporting Information) Laboratory ID Number 50N DIESO, CA 92110 Email Address for Result Reporting DAVID CONNET Tier 1 - (Results/Default if not specified) Report Tier Levels - please select EB-11-02/09/09 58-01-1909 An Employee - Owned Company 118-72-419 Tier II - (Results + QC) 4-52-W NV-23-3 Project Manager MW-23-2 Client Sample ID アン・パン・

Cooler/Blank /(Ice //No Ice

Time: }

Temperature

Time:

Received by: (Signature)

Time:

Date:

779.70

Relinquished by: (Signature)

Relinquished v. (Signature)

Relinquished by: (Signature)

o o Page 1

Columbia Analytical Services, Inc. Chain of Custody Report

Client:

Battelle

Service Request: P0900459

Project: JPL Groundwater Monitoring 1Q09/G486090

Tests	Date	Time	Sample Location / User	Disposed On
7196A				
	2/9/09	1619	P-37 / NFALLAHI	
7196A				
	2/9/09	1236	SMO / LKUKITA	
	2/9/09	1249	In Lab / NFALLAHI	
	2/9/09	1619	P-37 / NFALLAHI	
	2/9/09	1236	SMO / LKUKITA	
	2/9/09	1249	In Lab / NFALLAHI	
	2/9/09	1619	P-37 / NFALLAHI	
7196A				
	2/9/09	1236	SMO / LKUKITA	
	2/9/09	1249	In Lab / NFALLAHI	
	2/9/09	1619	P-37 / NFALLAHI	

7196A				
	2/9/09	1236	SMO / LKUKITA	
	2/9/09	1249	In Lab / NFALLAHI	
	2/9/09	1619	P-37 / NFALLAHI	
7196A				
	2/9/09	1236	SMO / LKUKITA	
	2/9/09	1619	P-37 / NFALLAHI	
				1, 11 1, 11 1, 11 1, 11 1, 11 1, 11 1, 11 1, 11 1, 11 1, 11 1, 11 1, 11 1, 11 1, 11 1, 11 1, 11 1, 11 1, 11 1,
7196A				
	2/9/09	1236	SMO / LKUKITA	
	2/9/09	1619	P-37 / NFALLAHI	
	7196A	7196A 2/9/09 2/9/09 2/9/09 7196A 2/9/09 2/9/09 2/9/09 7196A 2/9/09 2/9/09 2/9/09	7196A 2/9/09 1236 2/9/09 1619 7196A 2/9/09 1236 2/9/09 1249 2/9/09 1619 2/9/09 1236 2/9/09 1249 2/9/09 1619 7196A 2/9/09 1236 2/9/09 1249 2/9/09 1619 7196A 2/9/09 1236 2/9/09 1249 2/9/09 1619 7196A 2/9/09 1236 2/9/09 1619 7196A 2/9/09 1236 2/9/09 1619 7196A 2/9/09 1236 2/9/09 1249 2/9/09 1619 7196A 2/9/09 1236 2/9/09 1249 2/9/09 1619	7196A 2/9/09

Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client:	Battelle		oumpi	e Acceptance	Check I of h	Work order:	P0900459			
		ater Monitoring 1Q09	/ G486090		-					
	s) received on:			•	Date opened:		by:	LKUK		
		samples received by CAS.							on of	
compliance of	or nonconformity.	Thermal preservation and pl	I will only be eval	uated either at the	request of the cli	ent and/or as required	by the method/SOF	Yes	No	<u>N/A</u>
1	Were sample	containers properly r	narked with cl	lient sample II	79			X		
2	_	supplied by CAS?		Julio Bullipio II				\boxtimes		
3		ontainers arrive in go	od condition?					\boxtimes		
4	_	of-custody provided?						\boxtimes		
5		1-of-custody properly	completed?					\boxtimes		
		ontainer labels and/o	=	ith custody na	ners?			X		
7	_	volume received adequ		• • •	pers:			X		
8	_	vithin specified holding	-	15:				X		
9	•	emperature (thermal)	· ·	of cooler at rec	reint adhered	to?		X		
		Cooler Temperature	preservation) (Temperature	2	°C	<u></u>		
10	Was a trip bla	-		, C Diank	remperature	2			\boxtimes	
10	_	supplied by CAS:						_	بنت	
11	_	seals on outside of co	oler/Box?	*******					\boxtimes	
~ -	Location of						Sealing Lid?			×
		ure and date included	?				_ Scanning End:			X
	Were seals i		•							X
		seals on outside of sar	mple containe	r?					×	
	Location of		-				Sealing Lid?			×
		ure and date included	?	****						X
	Were seals i									X
12	Do containers	have appropriate pre	servation, acc	ording to metl	hod/SOP or C	lient specified in	nformation?	$\overline{\mathbf{x}}$		
		nt indication that the		_		1				\boxtimes
		ials checked for prese								\boxtimes
		nt/method/SOP requir			sample nH an	id if necessary al	ter it?			X
13	Tubes:	Are the tubes cap		-	sampio pri an	id <u>ii liceessai y</u> ai	tor it:			X
10		Do they contain	-	•						\boxtimes
14	Badges:	Are the badges p		A and intact?						X
14	Dauges.	Are dual bed bad			lly canned an	d intact?		П		\boxtimes
					000000000000000000000000000000000000000					
Lab	sample ID	Container Description	Required pH *	Received pH	Adjusted pH			t / Pres		1
D0000450	001.01		μ	γι:	γ 1 1	(Presence/Absence)		ommer	115	
P0900459 P0900459		125mL Plastic NP 125mL Plastic NP								
P0900459		125mL Plastic NP								
P0900459		125mL Plastic NP							-	
P0900459		125mL Plastic NP								
P0900459		125mL Plastic NP								
Explain as	ny 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); CN (NaO

Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client: Battelle	Work order:	P0900459		
Project: JPL Groundwater Monitoring 1Q09 / G486090				
Sample(s) received on: 2/9/09	Date opened: 2/9/09	by:	LKUKITA	

Lab Sample ID	Container Description	Required pH *	Received		VOA Headspace	
D0000450 006 01			pH	pH	(Presence/Absence)	CHAILETAS
P0900459-006.01	125mL Plastic NP			·		
					A 701.5 ± 1	
					X	
	1					
					40.00	

				<u> </u>		

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

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

Analytical Report

Client:

Battelle

Service Request: P0900459

Project Name:

JPL Groundwater Monitoring 1Q09

Date Collected: 02/09/09

Project Number: G486090

Date Received: 02/09/09

Sample Matrix: WATER

Chromium, Hexavalent

Prep Method:

None

Units: mg/L (ppm)

Analysis Method: 7196A

Basis: NA

Test Notes:

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
MW-23-4	P0900459-001	0.010	0.006	1	NA	02/09/09 16:30	ND	
MW-23-3	P0900459-002	0.010	0.006	1	NA	02/09/09 16:30	ND	
MW-23-2	P0900459-003	0.010	0.006	1	NA	02/09/09 16:30	ND	
MW-23-1	P0900459-004	0.010	0.006	1	NA	02/09/09 16:30	ND	
EB-11-02/09/09	P0900459-005	0.010	0.006	1	NA	02/09/09 16:30	ND	
SB-01-1Q09	P0900459-006	0.010	0.006	1	NA	02/09/09 16:30	ND	
Method Blank	P0900459-MB	0.010	0.006	1	NA	02/09/09 16:30	ND	

10

Report By:NFallahi

QA/QC Report

Client:

Battelle

Service Request: P0900459

Project:

JPL Groundwater Monitoring 1Q09 / G486090

Date Analyzed: 02/09/09

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	0.006	ND
CCB1	0.010	0.006	ND

ne Oudern

Approved By:

ICCBMDL/120594

QA/QC Report

Client: Project:

Battelle

JPL Groundwater Monitoring 1Q09 / G486090

Service Request: P0900459

Date Analyzed: 02/09/09

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
ICV	0.0418	0.0438	105
CCVI	0.0418	0.0438	105

me Oudern

Approved By:

CCV1A/120594

QA/QC Report

Client:

Project Name:

Battelle

JPL Groundwater Monitoring 1Q09

Service Request : P0900459

Date Collected:

NA

G486090 Project Number: Sample Matrix: WATER

Date Received: Date Extracted: NA NA

Date Analyzed:

02/09/09

Laboratory Control Sample Summary **Inorganic Parameters**

Sample Name:

Laboratory Control Sample

Units:

mg/L (ppm)

Lab Code:

P0900459-LCS

Basis: NA

Test Notes:

						CAS	
						Percent	
						Recovery	
Analyte	Prep Method	Analysis Method	True Value	Result		Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0419	105	92-113	

Date:

QA/QC Report

Client:

Battelle

Project Name:

JPL Groundwater Monitoring 1Q09

Project Number: G486090

Sample Matrix: WATER Service Request: P0900459

Date Collected: 02/09/09 Date Received: 02/09/09

Date Extracted: NA

Date Analyzed: 02/09/09

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name:

MW-23-3

P0900459-002MS

P0900459-002DMS

Units: mg/L (ppm)

Basis: NA

Lab Code: Test Notes:

	Prep	Analysis		Spike	Level	Sample	Spike	Result	•	ike overy	CAS Acceptance	Relative Percent	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	0.0541	0.0541	108	108	82-114	<1	



CAS SR #P0900480

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Hexavalent Chromium Raw Data	 14-24



LABORATORY REPORT

February 19, 2009

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

RE: JPL Groundwater Monitoring 1Q09 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on February 10, 2009. For your reference, these analyses have been assigned our service request number P0900480.

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; Department of the Navy (NFESC); Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-08-TX. 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.

Quelesso

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson Project Manager

Page 1 of 24

2655 Park Center Drive, Suite A

Simi Valley, California 93065

(805) 526-7161

(805) 526-7270 fax



Client:

Battelle

CAS Project No:

P0900480

Project:

JPL Groundwater Monitoring 1Q09 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on February 9, 2009 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.

Client:

Battelle

Project:

JPL Groundwater Monitoring 1Q09/G486090

Service Request: P0900480

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P0900480-001	MW-7	2/10/09	09:55
P0900480-002	MW-16	2/10/09	12:20
P0900480-003	DUPE-06-1Q08	2/10/09	00:00

Page 1 of 1

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

ICIon ChromatographyICBInitial Calibration BlankICVInitial Calibration VerificationLCSLaboratory Control SampleLUFTLeaking 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 Billionppm 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.

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.

water a Juli - Unain or Custouy necord a Analytical Service nequest

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

An Employee - Owned Company Phone (80	Phone (805) 526-7161 Fax (805) 526-7270	<u> </u>	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	urnaround 1 2 Day (75°	ime in Bu %) 3 Day (siness [50%) 4	ays (Sur Day (35%	charges) 5 Day) please (25%) 10	ircle Day - Si	andard		CAS P	Soject No.	CAS Project No.	
Company Name & Address (Reporting Information)	Information)	Project Name	Je			٠	Analys	is Meth	Analysis Method and/or Analytes	Analyte	s		CAS Contact:	ontact:		
Christine Le				•					Preservative Code	e Code				Pre	Preservative Key	
200,0 218 TALLO AVE, C-203	C-205	JP(6	GW MON	1009				6						о Т	None	-
240 JEGO GA 92110	01	Project Number	ıber			(pətə									HCL HNO3	
	•	0609845	06.		□ se	entro		(H2SO4	
ğ		P.O. # / Billin	P.O. # / Billing Information	77.6	ьн с	oppoo		<u> </u>							NaOH	
IN COUNER		1/6 4/7	/ SP : 1		Λ. IT [ntraci	S	1/-				-		- 2	Zn Acetate	tate
Phone		2011	STAN CENTED IT	AVE		042B	M/DE	<u>Z</u>)						1 0	Asc Acid	<u></u>
619-726-731		COLUMBUS	to, sus	OH 43201	webki	JS) [5 98 lev	O soi)						_	Other	
Email Address for Result Reporting	Sample	Sampler (Print & Sign)			9012B 🗆 O×	1 8015B		<i>I</i> C						. 4. 15		
Client Sample ID ID Number	atory Date mber Collected	Time	Matrix	Number of Containers	Volatile Ori 624 🗆 826 TPH Gas 8 TEX 802	eseiO H9T PPH Diese	TPH FC [N							Remarks	
) L-MM	1) 2/10/99	3560	3	7				×								
16	2	1220		2				X						MS/	MSD	Γ
DAPK-05-1908	3)	1		7				×						7	DUPLICATE	
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per, 4. Hew force																Ī
													-			
											_					
				- Anna Service Control	Japan	-	-	-	- -	-	-	-	-			
Report Tier Levels - please select Tier 1 - (Results/Default if not specified) Tier II - (Results + RC)	Tier III - ([Tier V - (cli	Tier III - (Data Validation Package) 10% Surcharge Tier V - (client specified)	ackage) 10% 9	Surcharge	M M	MRL required Yes_(No	4 Yes / No J required Yes / No	Yes / No	EE Typ	EDD required Yes / No	d Yes / No	acter	Project	Requireme	Project Requirements (MRLs, QAPP)	(a)
Reinfquished M. (Signaphre)		101/	0 1. Jul. 60	Received by (Signature)	(Signature)				3		Date (U) (I)	Time: 3 O.D.		- V		
elinquished by: (S	3	Date:	Time:	Received by: (Signature	(Signature)	1.tain		ا		<u> </u>	Pare: Date:	Time:	$\overline{\Box}$	Cooley/ Blank/ Ice	No Ice	
		_	_	_								_	<u> </u>	diuio		_

Columbia Analytical Services, Inc. Chain of Custody Report

Client:

Battelle

Service Request: P0900480

Project:

JPL Groundwater Monitoring 1Q09/G486090

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0900480-001.01					
	7196A				
		2/10/09	1351	SMO / MZAMORA	
		2/10/09	1352	P-37 / MZAMORA	
		2/10/09	1410	In Lab / NFALLAHI	
		2/10/09	1604	P-37 / NFALLAHI	
P0900480-002.01					
	7196A				
		2/10/09	1351	SMO / MZAMORA	
		2/10/09	1352	P-37 / MZAMORA	
		2/10/09	1410	In Lab / NFALLAHI	
		2/10/09	1604	P-37 / NFALLAHI	
P0900480-002.02					
		2/10/09	1351	SMO / MZAMORA	
		2/10/09	1352	P-37 / MZAMORA	
		2/10/09	1410	In Lab / NFALLAHI	
		2/10/09	1604	P-37 / NFALLAHI	
P0900480-003.01					
	7196A				
		2/10/09	1351	SMO / MZAMORA	
		2/10/09	1352	P-37 / MZAMORA	
		2/10/09	1410	In Lab / NFALLAHI	
		2/10/09	1604	P-37 / NFALLAHI	

Columbia Analytical Services, Inc. Sample Acceptance Check Form

	Battelle				<u> </u>	Work order:	P0900480			
		vater Monitoring 1Q0	9 / G486090					 		
. ,	s) received on:				Date opened		by:	MZAM		
Note: 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 will only be evaluated either at the request of the client and/or as required by the method/SOP. Yes No N/A										<u>N/A</u>
1	Were sample	containers properly:	marked with c	lient sample I	D9			$\overline{\mathbf{X}}$		
		supplied by CAS?	marked will e	ment bampie i.	υ.			$\overline{\mathbf{X}}$		
	` '	ontainers arrive in go	and condition?)				\boxtimes		
	_	_								
		of-custody provided?						\boxtimes		
		n-of-custody properly	-	-1414 1	0			X		
		ontainer labels and/c		• •	ipers?			X		
	_	volume received adequ	•	818?				\boxtimes		
	-	within specified holding	•			_		\boxtimes		
9		emperature (thermal	preservation)		-			\times		
		Cooler Temperature		°C Blank	Temperature	2	_°C	_		
10		ank received?							\boxtimes	
	-	supplied by CAS:					_			
11		seals on outside of co	ooler/Box?						\times	
	Location of						_Sealing Lid?			X
	_	ure and date included	!?							X
	Were seals i									X
•	Were custody	seals on outside of sar	mple containe	r?					\times	
	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 in	nformation?			X
	Is there a clie	nt indication that the	submitted sam	nples are pH p	reserved?					$\overline{\mathbf{X}}$
	Were VOA vials checked for presence/absence of air bubbles?								\boxtimes	
	Does the clier	nt/method/SOP requir	e that the anal	lyst check the	sample pH an	nd if necessary al	ter it?			\boxtimes
	Tubes:	Are the tubes cap			1 1					$\overline{\times}$
		Do they contain:	moisture?					\Box		\boxtimes
14]	Badges:	Are the badges p		d and intact?						\boxtimes
	g	Are dual bed bad			lly canned an	d intact?				\boxtimes
LabS	ampie ID	Container	Required	Received	Adjusted	VOA Headspaci		t / Prese		
		Description	pH *	pH	pH	(Presence/Absence)	'	ommen	s	
20900480-		125mL Plastic NP								
20900480-002.01 20900480-002.02		125mL Plastic NP								
20900480-002.02 20900480-003.01		125mL Plastic NP 125mL Plastic NP								
J J J J J J J J J J J J J J J J J J J	000.01	TECHNET HASHO INE								
Explain an	y discrepancies	: (include lab sample ID	numbers):							
			•							

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

Analytical Report

Client:

Battelle

Project Name:

JPL Groundwater Monitoring 1Q09

Project Number: Sample Matrix:

G486090

WATER

Service Request: P0900480

Date Collected: 02/10/09

Date Received: 02/10/09

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-7	P0900480-001	0.010	0.006	1	NA	02/10/09 15:35	ND	
MW-16	P0900480-002	0.010	0.006	1	NA	02/10/09 15:35	ND	
DUPE-06-1Q08	P0900480-003	0.010	0.006	1	NA	02/10/09 15:35	ND	
Method Blank	P0900480-MB	0.010	0.006	1	NA	02/10/09 15:35	ND	

QA/QC Report

Client:

Battelle

Service Request: P0900480

Project:

JPL Groundwater Monitoring 1Q09 / G486090

Date Analyzed: 02/10/09

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	0.006	ND
CCB1	0.010	0.006	ND

The Juderta

Approved By:

ICCBMDL/120594

Date:

QA/QC Report

Client: Project: Battelle

JPL Groundwater Monitoring 1Q09 / G486090

Service Request: P0900480

Date Analyzed: 02/10/09

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
ICV	0.0418	0.0430	103
CCV1	0.0418	0.0441	106

Approved By:

CCV1A/120594

Date: /

QA/QC Report

Client:

Battelle

Project Name:

JPL Groundwater Monitoring 1Q09

Service Request : Date Collected:

P0900480

Project Number: Sample Matrix:

G486090

Date Received: NA

NA

WATER

Date Extracted: NA Date Analyzed:

02/10/09

Laboratory Control Sample Summary

Inorganic Parameters

Sample Name:

Laboratory Control Sample

Units:

mg/L (ppm)

Lab Code:

P0900480-LCS

Basis:

NA

Test Notes:

						CAS Percent Recovery	
Analyte	Prep Method	Analysis Method	True Value	Result		Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0390	98	92-113	

QA/QC Report

Client:

Battelle

Project Name:

JPL Groundwater Monitoring 1Q09

Project Number: Sample Matrix:

G486090 WATER

Service Request: P0900480

Date Collected: 02/10/09

Date Received: 02/10/09 Date Extracted: NA

Date Analyzed: 02/10/09

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name:

MW-16

P0900480-002MS

P0900480-002DMS

Units: mg/L (ppm)

Basis: NA

Lab Code: Test Notes:

Spike CAS Relative Recovery Spike Level Prep Analysis Sample Spike Result Result Percent Acceptance Method Method PQL MS **DMS** Result MS DMS MS DMS Notes Analyte Difference Limits 7196A 0.010 0.0500 0.0500 ND 0.0532 0.0532 106 106 82-114 <1 Chromium, Hexavalent None



LABORATORY REPORT

February 19, 2009

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

RE: JPL Groundwater Monitoring 1Q09 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on February 11, 2009. For your reference, these analyses have been assigned our service request number P0900492.

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; Department of the Navy (NFESC); Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-08-TX. 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.

Indestr.

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson Project Manager

> Page 1 of 24

2655 Park Center Drive, Suite A

Simi Valley, California 93065

(805) 526-7161

(805) 526-7270 fax



Client:

Battelle

CAS Project No:

P0900492

Project:

JPL Groundwater Monitoring 1Q09 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on February 11, 2009 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.

Client:

Battelle

Project:

JPL Groundwater Monitoring 1Q09/G486090

Service Request: P0900492

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	<u>DATE</u>	TIME
P0900492-001	MW-13	2/11/09	09:01
P0900492-002	MW-8	2/11/09	11:09

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

ICIon ChromatographyICBInitial Calibration BlankICVInitial Calibration VerificationLCSLaboratory Control SampleLUFTLeaking Underground Fuel Tank

MModified MethodMDLMethod Detection LimitMRLMethod 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 Billionppm 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.

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.

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JOIN - UNAIN OF CUSTONY RECOID & AMAIYTICAL DELVICE REQUEST אמובו מ

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

Analytical

Columbia

Zn Acetate Asc Acid Project Requirements (MRLs, QAPP) CAS Project No. Preservative Key H2S04 HNO3 NaOH Other HCL Remarks アシイソシワ Cooler / Blank / Ice / No Ice 0 2 က 4 Ŋ 9 / CAS Contact: THE THE Time: EDD required Yes / No 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 Analysis Method and/or Analytes Preservative Code Type: MRL required Yes / No MDL JPQL / J required Yes / No 8270C (Subcontracted) □ 9Z9 SM\DD soinsgrO elatile Organics GC\MS TPH FC □ 8015M (Subconfracted) TPH Diesel Low Level 8015B 🗆 (Subcontracted) TPH Diesel 8015B □ (Subcontracted) □ 81EX 8021B □ MTBE 8021B TPH Gas 8015B □ Received by: (Signature) Volatile Organics GC/MS 624 ☐ 82608 ☐ Oxygenates ☐ TPH Gas ☐ ATTIVE CAMPAINS TOMPKINS Number of Containers GW MON 1009 Tier III - (Data Validation Package) 10% Surgharge OH 4320 P.O. #/ Billing Information 2 14319 BATTELLE SOST KING AVE. 022845 Matrix ٤ Project Number COLUMBUS Project Name Sampler (Print & Sign) 18C Time Collected jety - (client specified) 1109 1060 100 Date Collected Company Name & Address (Reporting Information) 3990 OLD TOWN AUE, C-205 Fax (805) 526-7270 Laboratory ID Number SAN DIEGO, CA 92110 Email Address for Result Reporting Fier 1 - (Results/Default if not specified) 60 N NCB Report Tier Levels - please select An Employee - Owned Company Relinquished by: (Signature) 181-726-731 Fier II - (Results + QG) BATTELLE Relinquished by (Signal DOVID Project Manager Client Sample ID M-13 \propto Relinquished to . 1 2 1 Phone

Temperature

Columbia Analytical Services, Inc. Chain of Custody Report

Client:

Battelle

Service Request: P0900492

Project:

JPL Groundwater Monitoring 1Q09/G486090

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0900492-001.01					
	7196A				
		2/11/09	1316	SMO / MZAMORA	
		2/11/09	1316	P-37 / MZAMORA	
		2/11/09	1354	In Lab / NFALLAHI	
		2/11/09	1506	P-37 / NFALLAHI	
P0900492-002.01					
	7196A				
		2/11/09	1316	SMO / MZAMORA	
		2/11/09	1316	P-37 / MZAMORA	
		2/11/09	1354	In Lab / NFALLAHI	
		2/11/09	1506	P-37 / NFALLAHI	
P0900492-002.02				P	
		2/11/09	1316	SMO / MZAMORA	
		2/11/09	1316	P-37 / MZAMORA	
		2/11/09	1354	In Lab / NFALLAHI	
		2/11/09	1506	P-37 / NFALLAHI	

Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client:	Battelle					Work order:	P0900492			
-		vater Monitoring 1Q0	9 / G486090							
•	s) received on			_	Date opened		by:	MZAN		
		samples received by CAS.				_			on of	
compliance	or nonconformity.	Thermal preservation and p	oH will only be eva	aluated either at the	e request of the cl	ient and/or as require	d by the method/SOI	P. <u>Yes</u>	No	N/A
1	Were sample	containers properly	marked with a	client sample I	D?			$\overline{\mathbf{X}}$		
2	_	supplied by CAS?	marked with	onone sample i				\boxtimes		
3		ontainers arrive in g	ood condition	2				\boxtimes		
4		of-custody provided?		•				X		
5		n-of-custody properly						\boxtimes		
		ontainer labels and/o	_	rith anatody no	mara 9					
	=		~ ~	- 1	apers?			\boxtimes		
7	_	volume received adeq	•	SIS (X		
8	•	within specified holdi	•	-C1t				\boxtimes		
9		emperature (thermal	preservation)		•		200	\boxtimes		
10		Cooler Temperature	-	°C Blank	Temperature	2	_°C		1571	_
10	-	ank received?							\boxtimes	
1.1	-	supplied by CAS:	= =1 = = /D = = =0					_	<u> </u>	
11		seals on outside of co	ooler/Box /				G 11 T 10		\boxtimes	
	Location of	, .	10				_Sealing Lid?			\boxtimes
	-	ure and date included	1?							\boxtimes
	Were seals i			0						\boxtimes
	_	seals on outside of sa	mpie containe	er?					\boxtimes	
	Location of						_Sealing Lid?			\boxtimes
		ure and date included	1?							\boxtimes
	Were seals i									\times
12		have appropriate pre		_		Client specified i	nformation?			\times
		nt indication that the			reserved?					X
	Were <u>VOA v</u>	ials checked for prese	ence/absence c	of air bubbles?						X
		nt/method/SOP requir		-	sample pH an	nd if necessary al	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 bac	lges separated	and individua	lly capped an	d intact?				X
LabS	ample ID	Container	Required	Received	Adjusted	VOA Headspac	e Receip	t / Prese	ervation	
		Description	рН *	pH	pH	(Presence/Absence		ommen		
P0900492	-001.01	125mL Plastic NP								
P0900492	-002.01	125mL Plastic NP								
P0900492	-002.02	125mL Plastic NP								
				` .						
						·				
Evnlain or	v dicerenancias	: (include lab sample II	) numbers):	L			<u> </u>	<del></del>		
enpani di	iy discrepancies	. (merude iau sampie il	mumbers):							
							<del> </del>			

# **DIVIDER SHEET**

# ANALYTICAL DATA FOR

**Hexavalent Chromium** 

**ANALYSIS** 

Analytical Report

Client:

Battelle

Project Name:

JPL Groundwater Monitoring 1Q09

Project Number: G486090 Sample Matrix:

WATER

Service Request: P0900492

**Date Collected:** 02/11/09

Date Received: 02/11/09

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-13	P0900492-001	0.010	0.006	1	NA	02/11/09 14:25	ND	
MW-8 Method Blank	P0900492-002 P0900492-MB	0.010 0.010	0.006	1	NA NA	02/11/09 14:25 02/11/09 14:25	ND ND	

ne Julester Date: 2/19/C

QA/QC Report

Client:

Battelle

Service Request: P0900492

Project:

JPL Groundwater Monitoring 1Q09 / G486090

Date Analyzed: 02/11/09

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	0.006	ND
CCB1	0.010	0.006	ND

Approved By:

ICCBMDL/120594

Eue Julesto Date: 2/19/09

QA/QC Report

Client: Project:

Battelle

JPL Groundwater Monitoring 1Q09 / G486090

Service Request: P0900492

Date Analyzed: 02/11/09

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
ICV	0.0418	0.0441	106
CCV1	0.0418	0.0441	106

Approved By:

CCV1A/120594

Date

QA/QC Report

Client:

Battelle

**Project Name:** 

JPL Groundwater Monitoring 1Q09

Project Number: Sample Matrix:

G486090 WATER

Service Request:

P0900492

Date Collected: NA

Date Received: NA NA

Date Extracted: Date Analyzed:

02/11/09

Laboratory Control Sample Summary

Inorganic Parameters

Sample Name:

Laboratory Control Sample

Lab Code:

P0900492-LCS

Units:

mg/L (ppm)

Basis:

NA

Test Notes:

CAS Percent Recovery Acceptance Prep Analysis Percent Result Limits Method Method True Value Result Recovery Notes Analyte Chromium, Hexavalent None 7196A 0.0400 0.0410 92-113 103

Approved By

Date:

QA/QC Report

Client:

Battelle

Project Name:

JPL Groundwater Monitoring 1Q09

Project Number: G486090 Sample Matrix:

WATER

Service Request: P0900492

Date Collected: 02/11/09

Date Received: 02/11/09

Date Extracted: NA

Date Analyzed: 02/11/09

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name:

MW-8

P0900492-002MS

P0900492-002DMS

Units: mg/L (ppm)

Basis: NA

Lab Code: Test Notes:

	Prep	Analysis		Spike	Level	Sample	Spike	Result		ike overy	CAS Acceptance	Relative Percent	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	0.0533	0.0533	107	107	82-114	<1	



# CAS SR #P0900507

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Hexavalent Chromium Raw Data	14-24



# LABORATORY REPORT

February 16, 2009

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

# RE: JPL Groundwater Monitoring 1Q09 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on February 12, 2009. For your reference, these analyses have been assigned our service request number P0900507.

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; Department of the Navy (NFESC); Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-08-TX. 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.

Julerka

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson Project Manager

Page 1 of 24



Client:

Battelle

CAS Project No:

P0900507

Project:

JPL Groundwater Monitoring 1Q09 / G486090

# **CASE NARRATIVE**

The samples were received intact under chain of custody on February 12, 2009 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.

Client:

Battelle

Project:

JPL Groundwater Monitoring 1Q09/G486090

Service Request: P0900507

# SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	<u>TIME</u>
P0900507-001	MW-10	2/12/09	08:13
P0900507-002	MW-15	2/12/09	11:39
P0900507-003	DUPE-07-1Q09	2/12/09	00:00
P0900507-004	MW-6	2/12/09	10:15

# 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

ICIon ChromatographyICBInitial Calibration BlankICVInitial Calibration VerificationLCSLaboratory Control SampleLUFTLeaking 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 Billionppm 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.

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.

# Page / of

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

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

Columbia Analytical

An Employee - Owned Company

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

Zn Acetate DISHOPE/20 LENET Asc Acid Project Requirements (MRLs, QAPP) Preservative Key H2S04 NaOH HN03 Other HCL OC LOVER 10 Remarks ပွ 15/25E Cooley / Blank / Ice / No Ice CAS Project No. CAS Contact EDD required Yes/ No Tack The Type: Filme: 15.7 Analysis Method and/or Analytes Preservative Code X X MRL required Yes ((No MDL / PQL / J required TPH FC 🗆 8015M (Subcontracted) TPH Diesel Low Level 8015B (Subcontracted) TPH Diesel 8015B □ (Subcontracted) TPH Gas 8015B ☐ BTEX 8021B ☐ M MTBE 8021B Received by: (Signature) Received by: (Signature C24 ☐ 8260B ☐ Oxygenates ☐ TPH Gas [] Volatile Organics GC/MS commisus, of 43201 Number of Containers ATTN: GENOLD TOMPKING PC (rw Man 100)
Project Number Tier III - (Data Validation Package) 10% Surcharge Tier V - (client specified) 505 KING AVE. N 214319/ BALTELLE Matrix 6486990 Project Name Sampler (Print & Sign) Date Time Collected Collected 813 1015 139 23 3990 OLD TOWN DUE, C-205 Company Name & Address (Reporting Information) 711/ Laboratory ID Number SAN DIEGO, CA 92110 Email Address for Result Reporting CONNER Fier 1 - (Results/Default if not specified) Report Tier Levels - please select Dupe-07-1009 619-726-731, Relinduish (Signature) Relinquished by: (Signature) Relinduished by: (Signature) Fier II - (Results + QC) Project Manager A/VA Client Sample ID MY-IS  $M \sim -6$ スラー, 0 Phone

# Columbia Analytical Services, Inc. Chain of Custody Report

Client: Project: Battelle

JPL Groundwater Monitoring 1Q09/G486090

Service Request: P0900507

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0900507-001.01					
	7196A				
		2/12/09	1342	SMO / LKUKITA	
		2/12/09	1357	In Lab / NFALLAHI	
		2/12/09	1508	P-37 / NFALLAHI	
P0900507-002.01					
	7196A				
		2/12/09	1342	SMO / LKUKITA	
		2/12/09	1357	In Lab / NFALLAHI	
		2/12/09	1508	P-37 / NFALLAHI	
P0900507-002.02					
		2/12/09	1342	SMO / LKUKITA	
		2/12/09	1356	In Lab / NFALLAHI	
		2/12/09	1508	P-37 / NFALLAHI	
P0900507-003.01					
	7196A				
		2/12/09	1342	SMO / LKUKITA	
		2/12/09	1356	In Lab / NFALLAHI	
		2/12/09	1508	P-37 / NFALLAHI	
P0900507-004.01					
	7196A				
		2/12/09	1342	SMO / LKUKITA	
		2/12/09	1356	In Lab / NFALLAHI	
		2/12/09	1508	P-37 / NFALLAHI	

# Columbia Analytical Services, Inc. Sample Acceptance Check Form

Client:	Battelle		<b>-</b>			Work order:	P0900507			
		water Monitoring 1Q09	7 / G486090		-					
•	s) received on			_	Date opened:			LKUK		
		all samples received by CAS							indicatio	n of
compliance	or nonconformity	y. Thermal preservation and	l pH will only be	evaluated either a	t the request of t	he client and/or as re-	quired by the meth	od/SOP. <u>Yes</u>	<u>No</u>	<u>N/A</u>
1	Were sample	e containers properly i	narked with c	lient sample II	)?			$\boxtimes$		
2	Container(s)	supplied by CAS?						$\boxtimes$		
3	Did sample o	containers arrive in go	od condition?					$\boxtimes$		
4	Was a chain-	-of-custody provided?						$\boxtimes$		
5	Was the chai	in-of-custody properly	completed?					$\boxtimes$		
6	Did sample o	container labels and/o	r tags agree w	ith custody par	oers?			$\boxtimes$		
		volume received adeq						$\boxtimes$		
		within specified holdir						$\boxtimes$		
9	Was proper t	emperature (thermal)	preservation) of	of cooler at rec	eipt adhered	to?		$\boxtimes$		
		Cooler Temperature	,		Temperature		°C	_		
10	Was a trip bl	ank received?		•	1	***************************************	_		X	
	Trip blank s	supplied by CAS:						_		_
11	Were custody	y seals on outside of co	ooler/Box?				_		$\boxtimes$	
	Location of	seal(s)?					Sealing Lid?			$\boxtimes$
	Were signat	ture and date included	?				_			X
	Were seals	intact?								X
	Were custody	seals on outside of sa	mple containe	r?					$\boxtimes$	
	Location of	seal(s)?					Sealing Lid?			$\times$
	Were signat	ture and date included	?				_			$\times$
	Were seals:	intact?								$\boxtimes$
12	Do containers	s have appropriate pre	servation, acc	cording to metl	hod/SOP or C	Client specified in	formation?	$\times$		
	Is there a clie	ent indication that the s	ubmitted sam	ples are <b>pH</b> p	reserved?					$\times$
	Were <b>VOA</b> v	vials checked for prese	nce/absence o	f air bubbles?						X
	Does the clie	nt/method/SOP require	e that the analy	yst check the s	ample pH and	d if necessary alt	er it?			$\overline{\times}$
	Tubes:	Are the tubes cap			1 1					$\boxtimes$
		Do they contain n	noisture?							$\boxtimes$
14	Badges:	Are the badges p	roperly cappe	d and intact?						$\boxtimes$
		Are dual bed badg			v capped and	intact?				$\boxtimes$
Lab S	ample ID	Container	Required	Received	Adjusted					
Lui G	ampie 1D	Description	pH *	pH	pH	VOA Headspace (Presence/Absence)		7 Prese ommen		
0900507-	-001.01	125mL Plastic NP								
0900507-		125mL Plastic NP								
0900507-	·· · · · · · · · · · · · · · · · · · ·	125mL Plastic NP								
0900507		125 mL Plastic NP	V			-				
0900507-	-004.01	125mL Plastic NP								
Explain an	v discrenancies	s: (include lab sample ID	numbers).				<u> </u>			

^{*}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);

# **DIVIDER SHEET**

# ANALYTICAL DATA FOR

**Hexavalent Chromium** 

**ANALYSIS** 

# Analytical Report

Client:

Battelle

Project Name:

JPL Groundwater Monitoring 1Q09

Project Number: G486090

Sample Matrix: WATER Service Request: P0900507

Date Collected: 02/12/09

Date Received: 02/12/09

Chromium, Hexavalent

Prep Method:

None

Analysis Method: 7196A

Test Notes:

Units: mg/L (ppm)

ND

Basis: NA

02/12/09 15:05

Dilution Date Date/Time Result Sample Name Lab Code **PQL** MDL Factor Extracted Analyzed Notes Result MW-10 P0900507-001 0.010 0.006 1 NA 02/12/09 15:05 ND MW-15 P0900507-002 0.010 0.006 1 NA 02/12/09 15:05 ND DUPE-07-1Q09 P0900507-003 0.010 0.006 1 NA 02/12/09 15:05 ND MW-6 P0900507-004 0.010 0.0061 NA 02/12/09 15:05 ND Method Blank P0900507-MB

0.006

1

NA

0.010

QA/QC Report

Client:

Battelle

Project:

JPL Groundwater Monitoring 1Q09 / G486090

Service Request: P0900507

Date Analyzed: 02/12/09

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	0.006	ND
CCB1	0.010	0.006	ND

Dul Julesta

Approved By:

ICCBMDL/120594

Date:

# QA/QC Report

Client: Battelle

Project: JPL Groundwater Monitoring 1Q09 / G486090 Service Request: P0900507

Date Analyzed: 02/12/09

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
ICV	0.0418	0.0420	100
CCV1	0.0418	0.0420	100

The Cullert

CCV1A/120594

QA/QC Report

Client: Battelle

**Project Name:** JPL Groundwater Monitoring 1Q09 **Project Number:** 

Laboratory Control Sample

G486090 WATER

P0900507-LCS

Service Request: Date Collected:

P0900507

NA Date Received: NA

Date Extracted: NA Date Analyzed: 02/12/09

Laboratory Control Sample Summary Inorganic Parameters

Units: mg/L (ppm)

Basis: NA

Lab Code: Test Notes:

Sample Name:

Sample Matrix:

CAS Percent Recovery Prep Analysis Percent Acceptance Result Analyte Method Method True Value Result Recovery Limits Notes Chromium, Hexavalent None 7196A 0.0400 0.0390

98 92-113

QA/QC Report

Client: Battelle

**Project Name:** JPL Groundwater Monitoring 1Q09

**Project Number**: G486090 **Sample Matrix**: WATER Service Request: P0900507

Date Collected: 02/12/09

Date Received: 02/12/09

Date Extracted: NA

Date Analyzed: 02/12/09

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : Lab Code : MW-15

P0900507-002MS

P0900507-002DMS

Units: mg/L (ppm)

Basis: NA

Test Notes:

	Prep	Analysis		Spike	Level	Sample	Spike	Result		oike overy	CAS	Relative	Result
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	0.0531	0.0531	106	106	82-114	<1	

Approved By

I

13

2655 Park Center Drive, Suite A



### CAS SR #P0900527

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Hexavalent Chromium Raw Data	14-24



#### LABORATORY REPORT

February 16, 2009

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

RE: JPL Groundwater Monitoring 1Q09 / G486090

Dear David:

Enclosed are the results of the sample submitted to our laboratory on February 13, 2009. For your reference, this analysis has been assigned our service request number P0900527.

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; Department of the Navy (NFESC); Pennsylvania Registration No. 68-03307; TX Commission of Environmental Quality, NELAP ID T104704413-08-TX. 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.

Juderte

Respectfully submitted,

Columbia Analytical Services, Inc.

Sue Anderson Project Manager

> Page 1 of <u>24</u>

2655 Park Center Drive, Suite A

Simi Valley, California 93065

(805) 526-7161

(805) 526-7270 fax



Client:

Battelle

CAS Project No:

P0900527

Project:

JPL Groundwater Monitoring 1Q09 / G486090

#### CASE NARRATIVE

The sample was received intact under chain of custody on February 13, 2009 and was 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 sample 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.

Client:

Battelle

Project:

JPL Groundwater Monitoring 1Q09/G486090

Service Request: P0900527

# SAMPLE CROSS-REFERENCE

SAMPLE # P0900527-001 CLIENT SAMPLE ID

MW-5

<u>DATE</u>

<u>TIME</u>

2/13/09

08:16

# 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

ICIon ChromatographyICBInitial Calibration BlankICVInitial Calibration VerificationLCSLaboratory Control SampleLUFTLeaking 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

ppbParts Per BillionppmParts 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.

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.

# **aici a con - Onani oi Ousiouy itecoiu a Anaiyiicai deivice nequesi

CAS Project No. 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 2655 Park Center Drive, Suite A Simi Valley, California 93065 Phone (805) 526-7161 Fax (805) 526-7270 Columbia
Analytical
Services NC
An Employee - Owned Company

Common Nama & Address (Bosseline Information)	Omoin Momo		Ar	Analysis Method and/or Analytes	Analytes	CAS Contact:	
Port A C	10,000 140110					Procenyative Key	Τ.
1000 of The Wale, C-205	JFC GW MON	MON 1989		1 O   Code	Code	0 None	
340 000 100 00000	Project Number	<b>.</b>	(eq)			- HCL	
SBN 51850, 01 7110	C48600	Ç					
Project Manager	P.O. # / Billing I	Information	ipcoi	(S		3 H2SO4	
DAVID COLNET	2143/9/30TTELLE	30776266	racte   (Su				tate
Phone Fax	DITTY. GET	COLD TOMPER	S18 contra 58 C				<u> </u>
1152-972-619	2 ×0× COLATO	COLUMBUS, OF 4570	Snpco (Snp (Snp BE 80 Macust				
sult Reporting	Sampler (Print & Sign)		De soine  (xo = 82 to    TM = 82 to    TM = 82 to    Batos  Welve wol				
Client Sample ID Laboratory Date	Time	Matrix Containers	atile Organie Andrewskie Station of Station			Remarks	
		COltain	10V   10V   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120   120	2			T
MW-5 13/	J 9180 m	7 2		×		MS/MSD/AC TITE	1
100 A CO		A CO	1	1 (de)			
)							
							Π
							T
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				_			
Report Tier Levels - please select Tier. L. (Results/Default if not specified) Tier III - Tier II - (Results + QC)	Trer III - (Data Validation Package) 10% Surc	age) 10% Surcharge	MRL required Y	Yes / No	EDD required Yes/No.	Project Requirements (MRLs, QAPP)	(d
-\	(	me: Received by: (Si	phatrice//		Total A Contine 1 UV	<u>st</u>	
Relinquished (Signature)	Date() 2 / 12/3 Ti	Tjing:	ceived-by: (Signature)		1778	Cooler/ Blank / Ice / No Ice	Ī
Relinquished by: (Signature)	3	AR BE	Received by: (Signature)		7	Tomographics	

# Columbia Analytical Services, Inc. Chain of Custody Report

Client:

Battelle

Service Request: P0900527

Project: JPL Groundwater Monitoring 1Q09/G486090

Bottle ID	Tests	Date	Time	Sample Location / User	Disposed On
P0900527-001.01					
	7196A				
		2/13/09	1149	SMO / LKUKITA	
		2/13/09	1208	In Lab / SANDERSON	
		2/13/09	1308	P-37 / SANDERSON	
P0900527-001.02					
		2/13/09	1149	SMO/LKUKITA .	
		2/13/09	1208	In Lab / SANDERSON	
		2/13/09	1308	P-37 / SANDERSON	

# Columbia Analytical Services, Inc. Sample Acceptance Check Form

	Battelle				_	Work order:	P0900527			
_		vater Monitoring 1Q09	9 / G486090							
-	(s) received on:				Date opened		by:	LKUK		
		samples received by CAS.							on of	
		Thermal preservation and p				ient and/or as requi	red by the method/SO	<u>Yes</u>	No	<u>N/A</u>
1	-	containers properly	marked with c	ment sample L	D?			$\boxtimes$		
2		supplied by CAS?	1 11.7					$\boxtimes$		
3	_	ontainers arrive in go	ood condition?	<i>(</i>				X		
4		of-custody provided?						X		
5		n-of-custody properly	-					$\boxtimes$		
6	_	ontainer labels and/o		• -	pers?			$\boxtimes$		
7	-	volume received adequ	•	sis?				$\boxtimes$		
8	-	within specified holding	_					$\overline{\times}$		
9		emperature (thermal	preservation)		•			X		
		Cooler Temperature		°C Blank	Temperature	3	°C			
10	_	ank received?							X	
	-	supplied by CAS:					******			
11	· ·	seals on outside of co	ooler/Box?						$\boxtimes$	
	Location of	• •					Sealing Lid?			$\boxtimes$
	=	ture and date included	.7							$\boxtimes$
	Were seals i									$\boxtimes$
		seals on outside of sa	mple containe	r?					$\boxtimes$	
	Location of	* *					Sealing Lid?			$\boxtimes$
		ture and date included	?							$\boxtimes$
10	Were seals i			<b>1</b>	1 1/200	71.				$\boxtimes$
12		have appropriate <b>pre</b>		-		lient specified	information?	$\boxtimes$		
		ent indication that the			reserved?					×
		ials checked for prese								$\boxtimes$
		nt/method/SOP requir		•	sample pH ar	nd if necessary	alter it?			$\overline{\times}$
13	Tubes:	Are the tubes cap	•	17						$\times$
		Do they contain:								$\overline{\mathbf{X}}$
14	Badges:	Are the badges p	1 2 11							$\boxtimes$
		Are dual bed bac	ges separated	and individua	lly capped an	id intact?				$\boxtimes$
Lab	Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspa (Presence/Absen	<b>!</b>	it / Presi Commen		
0900527	7-001-01	125mL Plastic NP	,							
0900527		125mL Plastic NP						<del></del>		
Explain a	ny discrepancies	:: (include lab sample II)	numbers):							
					···					
										7

^{*}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); RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

# **DIVIDER SHEET**

# ANALYTICAL DATA FOR

**Hexavalent Chromium** 

**ANALYSIS** 

# Analytical Report

Client:

Battelle

Project Name:

JPL Groundwater Monitoring 1Q09

Project Number: G486090 Sample Matrix:

WATER

Service Request: P0900527

Date Collected: 02/13/09

Date Received: 02/13/09

Chromium, Hexavalent

'rep Method:

None

Analysis Method: 7196A

Units: mg/L (ppm)

Basis: NA

Test Notes:

Sample Name	Lab Code	PQL	MDL	Dilution Factor	Date Extracted	Date/Time Analyzed	Result	Result Notes
ЛW-5 Леthod Blank	P0900527-001 P0900527-MB	0.010 0.010	0.006 0.006	1	NA NA	02/16/09 12:45 02/16/09 12:45	ND ND	

Que Judeske. Date: 2/16/09

QA/QC Report

Client:

Battelle

Service Request: P0900527

Project:

JPL Groundwater Monitoring 1Q09 / G486090

Date Analyzed: 02/13/09

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	0.006	ND
CCB1	0.010	0.006	ND

Approved By: ICCBMDL/120594

QA/QC Report

Client: Project: Battelle

JPL Groundwater Monitoring 1Q09 / G486090

Service Request: P0900527

Date Analyzed: 02/13/09

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
ICV	0.0418	0.0408	98
CCVI	0.0418	0.0408	98

Approved By:

CCV1A/120594

QA/QC Report

Client:

Battelle

Service Request:

P0900527

Project Name:

JPL Groundwater Monitoring 1Q09

Date Collected:

NA

Project Number:

G486090

Date Received:

NA

Sample Matrix:

WATER

Date Extracted: NA Date Analyzed:

02/16/09

Laboratory Control Sample Summary Inorganic Parameters

Sample Name:

Laboratory Control Sample

Units:

mg/L (ppm)

_ab Code :

P0900527-LCS

Basis:

NA

Γest Notes:

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.0400	0.0387	97	92-113	

QA/QC Report

Client:

Battelle

Project Name:

JPL Groundwater Monitoring 1Q09

Project Number: G486090 Sample Matrix:

WATER

Service Request: P0900527

**Date Collected:** 02/13/09 Date Received: 02/13/09

Date Extracted: NA

Date Analyzed: 02/16/09

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name:

MW-5

_ab Code :

P0900527-001MS

P0900527-001DMS

Units: mg/L (ppm)

Basis: NA

Γest Notes:

Analyte	Prep Method	Analysis Method	PQL	Spike MS	Level DMS	Sample Result	Spike MS	Result DMS	Rec	oike overy DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.0500	0.0500	ND	0.0478	0.0478	96	96	82-114	<1	

auleste Date: