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

Columbia Analytical Services INC.
An Employee - Owned Company

CAS SR #P0802261

Table of Contents

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

Columbia Analytical Services INC.
An Employee - Owned Company

LABORATORY REPORT

July 22, 2008

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

RE: JPL Groundwater Monitoring 3Q08 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on July 18, 2008. For your reference, these analyses have been assigned our service request number P0802261.

All analyses were performed in accordance with our laboratory's quality assurance program. 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. 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.

Sue Anderson
Project Manager

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

Client: Battelle
Project: JPL Groundwater Monitoring 3Q08 / G486090

CAS Project No: P0802261

CASE NARRATIVE

The samples were received intact under chain of custody on July 18, 2008 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.

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P0802261-001	MW-21-5	07/18/08	08:00
P0802261-002	MW-21-4	07/18/08	08:55
P0802261-003	MW-21-3	07/18/08	09:19
P0802261-004	MW-21-2	07/18/08	09:47
P0802261-005	MW-21-1	07/18/08	10:58
P0802261-006	EB-01-7/18/08	07/18/08	10:15

Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl *tert*-Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
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

Page 1 of 1

Columbia Analytical Services INC.
An Employee - Owned Company
2655 Park Center Drive, Suite A
Simi Valley, California 93065
Phone (805) 526-7161
Fax (805) 526-7270

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

CAS Project No.: P0802261

CAS Contact:

Company Name & Address (Reporting Information)	Project Name	Project Number
BATTELLE 3990 OLD TOWN AVE, C-205 SAN DIEGO, CA 92110	JPL GW MON. 3008	G486090

Project Manager	P.O. # / Billing Information
DAVID CONNER	214319/ BATTELLE ATTN: GERALD TOMPKINS 505 KING AVE. COLUMBUS, OH 43201

Phone	Fax
619-726-7311	

Email Address for Result Reporting	Sampler (Print & Sign)

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas ☐	TPH Gas 8015B ☐ BTEX 8021B ☐ MTBE 8021B ☐	TPH Diesel 8015B ☐ (Subcontracted)	TPH Diesel Low Level 8015B ☐ (Subcontracted)	TPH FC ☐ 8015M (Subcontracted)	Semi-Volatile Organics GC/MS 625 ☐ 8270C ☐ (Subcontracted)	0	Cr III (7196)	Remarks
MW-21-5	1	7/18/08	800	W	1							X		
MW-21-4	2		855									X		
MW-21-3	3		919									X		
MW-21-2	4		947									X		
MW-21-1	5		1058									X		
EB-01-7/18/08	6		1015									X		EQUIP. BLANK

Preservative Key

0	None
1	HCL
2	HNO3
3	H2SO4
4	NaOH
5	Zn Acetate
6	Asc Acid
7	Other

Report Tier Levels - please select

Tier I - (Results/Default if not specified) ____
Tier II - (Results + QC) ____
Tier III - (Data Validation Package) 10% Surcharge ____
Tier V - (client specified) ✓

MRL required Yes / No
MDL / PQL / J required Yes / No

EDD required Yes / No
Type: Geotracker

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	7/18/08	1131		7/18/08	1131
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	7/18/08	1220		7/18/08	1220
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Cooler / Blank / Ice / No Ice

Temperature 3 °C

Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL Groundwater Monitoring 3Q08/G486090

Service Request: P0802261

Bottle ID	Date	Time	Sample Location / User	Disposed On
P0802261-001.01	07/18/2008	1223	SMO / LKUKITA	
	07/18/2008	1228	In Lab / DCASTILLO	
	07/18/2008	1502	P-37 / DCASTILLO	
P0802261-002.01	07/18/2008	1223	SMO / LKUKITA	
	07/18/2008	1228	In Lab / DCASTILLO	
	07/18/2008	1502	P-37 / DCASTILLO	
P0802261-003.01	07/18/2008	1223	SMO / LKUKITA	
	07/18/2008	1228	In Lab / DCASTILLO	
	07/18/2008	1502	P-37 / DCASTILLO	
P0802261-004.01	07/18/2008	1223	SMO / LKUKITA	
	07/18/2008	1228	In Lab / DCASTILLO	
	07/18/2008	1502	P-37 / DCASTILLO	
P0802261-005.01	07/18/2008	1223	SMO / LKUKITA	
	07/18/2008	1228	In Lab / DCASTILLO	
	07/18/2008	1502	P-37 / DCASTILLO	
P0802261-006.01	07/18/2008	1223	SMO / LKUKITA	
	07/18/2008	1228	In Lab / DCASTILLO	
	07/18/2008	1502	P-37 / DCASTILLO	

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0802261

Project: JPL Groundwater Monitoring 3Q08 / G486090

Sample(s) received on: 7/18/08 Date opened: 7/18/08 by: LKUKITA

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
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Container(s) **supplied by CAS**?	☒	☐	☐
3	Did **sample containers** arrive in good condition?	☒	☐	☐
4	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
5	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
6	Was **sample volume** received adequate for analysis?	☒	☐	☐
7	Are samples within specified holding times?	☒	☐	☐
8	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature _____ °C Blank Temperature 3 °C			
9	Was a **trip blank** received?	☐	☐	☒
	Trip blank supplied by CAS: Serial # _____ -TB _____			
10	Were **custody seals** on outside of cooler/Box?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
	Were custody seals on outside of sample container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
11	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
12	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
	Do they contain moisture?	☐	☐	☒
13	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0802261-001.01	125mL Plastic NP					
P0802261-002.01	125mL Plastic NP					
P0802261-003.01	125mL Plastic NP					
P0802261-004.01	125mL Plastic NP					
P0802261-005.01	125mL Plastic NP					
P0802261-006.01	125mL Plastic NP					

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

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

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL Groundwater Monitoring 3Q08
Project Number : G486090
Sample Matrix : WATER

Service Request : P0802261
Date Collected : 07/18/08
Date Received : 07/18/08

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-21-5	P0802261-001	0.010	0.006	1	NA	07/18/08 13:05	ND	
MW-21-4	P0802261-002	0.010	0.006	1	NA	07/18/08 13:05	ND	
MW-21-3	P0802261-003	0.010	0.006	1	NA	07/18/08 13:05	ND	
MW-21-2	P0802261-004	0.010	0.006	1	NA	07/18/08 13:05	ND	
MW-21-1	P0802261-005	0.010	0.006	1	NA	07/18/08 13:05	ND	
EB-01-7/18/08	P0802261-006	0.010	0.006	1	NA	07/18/08 13:05	ND	
Method Blank	P0802261-MB	0.010	0.006	1	NA	07/18/08 13:05	ND	

Approved By _____ Date : 7/22/08

Report By:DCastillo

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Batelle	**Service Request:**	P0802261
Project:	JPL Groundwater Monitoring 3Q08/G486090	**Date Analyzed:**	7/18/08

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
CCB	0.010	0.006	ND

Approved By: Joe Anderson Date: 7/22/08

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Batelle	**Service Request:**	P0802261
Project:	JPL Groundwater Monitoring 3Q08/G486090	**Date Analyzed:**	7/18/08

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

Sample Name	True Value	Result	Percent Recovery	Acceptance Criteria
ICV	0.0418	0.0406	97	90-110
CCV	0.0418	0.0430	103	90-110

Approved By: Joe Anderson Date: 7/22/08

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P0802261
Project Name :	JPL Groundwater Monitoring 3Q08	**Date Collected :**	NA
Project Number :	G486090	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	07/18/08

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P0802261-LCS	Basis :	NA
Test Notes :			

Analyte	**Prep Method**	**Analysis Method**	**True Value**	**Result**	**Percent Recovery**	**CAS Percent Recovery Acceptance Limits**	**Result Notes**
Chromium, Hexavalent	None	7196A	0.040	0.0422	106	92-113	

Approved By ____________________ Date : 7/22/08

Report By:DCastillo

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P0802261
Project Name :	JPL Groundwater Monitoring 3Q08	**Date Collected :**	07/18/08
Project Number :	G486090	**Date Received :**	07/18/08
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	07/18/08

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name :	MW-21-5		Units :	mg/L (ppm)
Lab Code :	P0802261-001MS	P0802261-001DMS	Basis :	NA
Test Notes :				

Analyte	Prep Method	Analysis Method	PQL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Spike Recovery MS	Spike Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.050	0.050	ND	0.0568	0.0568	114	114	82-114	<1	

Approved By Sue Anderson Date : 7/22/08

Report By:DCastillo

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

Columbia Analytical Services INC.
An Employee - Owned Company

CAS SR #P0802271

Table of Contents

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

Columbia Analytical Services INC.
An Employee - Owned Company

LABORATORY REPORT

July 22, 2008

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

RE: JPL Groundwater Monitoring 3Q08 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on July 21, 2008. For your reference, these analyses have been assigned our service request number P0802271.

All analyses were performed in accordance with our laboratory's quality assurance program. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains _____ pages.

Columbia Analytical Services, Inc. is certified by the California Department of Health Services, NELAP Laboratory Certificate No. 02115CA; Arizona Department of Health Services, Certificate No. AZ0694; Florida Department of Health, NELAP Certification E871020; New Jersey Department of Environmental Protection, NELAP Laboratory Certification ID #CA009; New York State Department of Health, NELAP NY Lab ID No: 11221; Oregon Environmental Laboratory Accreditation Program, NELAP ID: CA20007; The American Industrial Hygiene Association, Laboratory #101661; Department of the Navy (NFESC); Pennsylvania Registration No. 68-03307. 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.

Sue Anderson
Project Manager

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

Columbia Analytical Services INC.
An Employee - Owned Company

Client: Battelle CAS Project No: P0802271
Project: JPL Groundwater Monitoring 3Q08 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on July 21, 2008 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.

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P0802271-001	MW-14-3	07/21/08	08:55
P0802271-002	MW-14-2	07/21/08	09:30
P0802271-003	MW-14-1	07/21/08	10:50
P0802271-004	DUPE-01-3Q08	07/21/08	00:00
P0802271-005	EB-02/7/21/08	07/21/08	10:40

Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl *tert*-Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
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 INC.
An Employee - Owned Company

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

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

CAS Project No. P0802271

CAS Contact:

Company Name & Address (Reporting Information)	Project Name
BATTELLE 3990 OLD TOWN AVE., C-205 SAN DIEGO, CA 92110	JPL GW MON. 3Q08
Project Manager	**Project Number**
DAVID CONNER	G486090
Phone / **Fax**	**P.O. # / Billing Information**
619-726-7311	214319/BATTELLE ATTN: GERALD TOMPKINS 505 KING AVE. COLUMBUS, OH 43201
Email Address for Result Reporting	**Sampler (Print & Sign)**

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas ☐	TPH Gas 8015B ☐ BTEX 8021B ☐ MTBE 8021B ☐	TPH Diesel 8015B ☐ (Subcontracted)	TPH Diesel Low Level 8015B ☐ (Subcontracted)	TPH FC ☐ 8015M (Subcontracted)	Semi-Volatile Organics GC/MS 625 ☐ 8270C ☐ (Subcontracted)	0 or II (7/96)	Remarks
MW-14-3	(1)	7/21/00	855	W	1							X	
MW-14-2	(2)		930		1							X	
MW-14-1	(3)		1050		1							X	
DUPE-01-3Q08	(4)		—		1							X	DUPLICATE
EB-02/7/21/00	(5)		1040		1							X	EQUIPMENT BLANK

Preservative Key

0	None
1	HCL
2	HNO3
3	H2SO4
4	NaOH
5	Zn Acetate
6	Asc Acid
7	Other

Report Tier Levels - please select

Tier I - (Results/Default if not specified) ____
Tier II - (Results + QC) ____
Tier III - (Data Validation Package) 10% Surcharge ____
Tier V - (client specified) ____

MRL required Yes / No
MDL / PQL / J required Yes / No

EDD required Yes / No
Type: ____

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)		Date: 7/21/00	Time: 1130	Received by: (Signature)		Date: 7/21/00	Time: 1156
Relinquished by: (Signature)		Date: 7/21/00	Time: 1215	Received by: (Signature)		Date: 7/21/00	Time: 1215
Relinquished by: (Signature)		Date:	Time:	Received by: (Signature)		Date:	Time:

(Cooler / Blank / Ice) / No Ice

Temperature 2 °C

Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL Groundwater Monitoring 3Q08/G486090

Service Request: P0802271

Bottle ID	Date	Time	Sample Location / User	Disposed On
P0802271-001.01	07/21/2008	1232	SMO / MZAMORA	
	07/21/2008	1232	P-37 / MZAMORA	
	07/21/2008	1502	In Lab / SANDERSON	
	07/21/2008	1723	P-37 / SANDERSON	
P0802271-002.01	07/21/2008	1232	SMO / MZAMORA	
	07/21/2008	1232	P-37 / MZAMORA	
	07/21/2008	1502	In Lab / SANDERSON	
	07/21/2008	1724	P-37 / SANDERSON	
P0802271-003.01	07/21/2008	1232	SMO / MZAMORA	
	07/21/2008	1232	P-37 / MZAMORA	
	07/21/2008	1502	In Lab / SANDERSON	
	07/21/2008	1724	P-37 / SANDERSON	
P0802271-004.01	07/21/2008	1232	SMO / MZAMORA	
	07/21/2008	1232	P-37 / MZAMORA	
	07/21/2008	1502	In Lab / SANDERSON	
	07/21/2008	1724	P-37 / SANDERSON	
P0802271-005.01	07/21/2008	1232	SMO / MZAMORA	
	07/21/2008	1232	P-37 / MZAMORA	
	07/21/2008	1502	In Lab / SANDERSON	
	07/21/2008	1724	P-37 / SANDERSON	

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0802271

Project: JPL Groundwater Monitoring 3Q08 / G486090

Sample(s) received on: 7/21/08 Date opened: 7/21/08 by: MZAMORA

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
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Container(s) **supplied by CAS**?	☒	☐	☐
3	Did **sample containers** arrive in good condition?	☒	☐	☐
4	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
5	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
6	Was **sample volume** received adequate for analysis?	☒	☐	☐
7	Are samples within specified holding times?	☒	☐	☐
8	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature 2 °C Blank Temperature _____ °C			
9	Was a **trip blank** received?	☐	☐	☒
	Trip blank supplied by CAS: Serial # _____ -TB _____			
10	Were **custody seals** on outside of cooler/Box?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
	Were custody seals on outside of sample container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
11	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☐	☐	☒
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
12	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
	Do they contain moisture?	☐	☐	☒
13	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0802271-001.01	125mL Plastic NP					
P0802271-002.01	125mL Plastic NP					
P0802271-003.01	125mL Plastic NP					
P0802271-004.01	125mL Plastic NP					
P0802271-005.01	125mL Plastic NP					

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

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

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL Groundwater Monitoring 3Q08
Project Number : G486090
Sample Matrix : WATER

Service Request : P0802271
Date Collected : 07/21/08
Date Received : 07/21/08

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-14-3	P0802271-001	0.01	0.006	1	NA	07/21/08 16:55	ND	
MW-14-2	P0802271-002	0.01	0.006	1	NA	07/21/08 16:55	ND	
MW-14-1	P0802271-003	0.01	0.006	1	NA	07/21/08 16:55	ND	
DUPE-01-3Q08	P0802271-004	0.01	0.006	1	NA	07/21/08 16:55	ND	
EB-02/7/21/08	P0802271-005	0.01	0.006	1	NA	07/21/08 16:55	ND	
Method Blank	P0802271-MB	0.01	0.006	1	NA	07/21/08 16:55	ND	

Approved By Sue Anderson Date : 7/22/08

Report By:DCastillo

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Batelle	**Service Request:**	P0802271
Project:	JPL Groundwater Monitoring 3Q08/G486090	**Date Analyzed:**	7/21/08

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
CCB	0.010	0.006	ND

Approved By: _____ Date: 7/22/08

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Batelle	**Service Request:**	P0802271
Project:	JPL Groundwater Monitoring 3Q08/G486090	**Date Analyzed:**	7/21/08

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

Sample Name	True Value	Result	Percent Recovery	Acceptance Criteria
ICV	0.0418	0.0434	104	90-110
CCV	0.0418	0.0443	106	90-110

Approved By: _____ Date: 7/22/08

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P0802271
Project Name :	JPL Groundwater Monitoring 3Q08	**Date Collected :**	NA
Project Number :	G486090	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	07/21/08

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P0802271-LCS	Basis :	NA
Test Notes :			

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.040	0.0405	101	92-113	

Approved By Sue Anderson Date : 7/22/08

Report By:DCastillo

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P0802271
Project Name :	JPL Groundwater Monitoring 3Q08	**Date Collected :**	07/21/08
Project Number :	G486090	**Date Received :**	07/21/08
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	07/21/08

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name :	MW-14-3		Units :	mg/L (ppm)
Lab Code :	P0802271-001MS	P0802271-001DMS	Basis :	NA
Test Notes :				

Analyte	Prep Method	Analysis Method	PQL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Spike Recovery MS	Spike Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.01	0.050	0.050	ND	0.0463	0.0463	93	93	82-114	<1	

Approved By Sue Anderson Date : 7/22/08

Report By:DCastillo

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

Columbia Analytical Services INC.
An Employee - Owned Company

CAS SR #P0802320

Table of Contents

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

Columbia Analytical Services INC.
An Employee - Owned Company

LABORATORY REPORT

July 31, 2008

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

RE: JPL Groundwater Monitoring 3Q08 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on July 23, 2008. For your reference, these analyses have been assigned our service request number P0802320.

All analyses were performed in accordance with our laboratory's quality assurance program. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains 27 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. 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.

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: P0802320
Project: JPL Groundwater Monitoring 3Q08 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on July 23, 2008 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 3Q08/G486090

Service Request: P0802320

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P0802320-001	MW-17-4	07/23/08	09:00
P0802320-002	MW-17-3	07/23/08	09:50
P0802320-003	MW-17-2	07/23/08	10:19
P0802320-004	DUPE-3-3Q08	07/23/08	00:00
P0802320-005	EB-04-7/23/08	07/23/08	10:07
P0802320-006	MW-18-4	07/23/08	12:00
P0802320-007	MW-18-3	07/23/08	12:29
P0802320-008	MW-18-2	07/23/08	13:15
P0802320-009	DUPE-4-3Q08	07/23/08	00:00

Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl *tert*-Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
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

Page 1 of 1

Columbia Analytical Services INC.
An Employee - Owned Company

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

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

CAS Project No. P080320

CAS Contact:

Company Name & Address (Reporting Information)	Project Name
BATTELLE 3990 OLD TOWN AVE C-205 SAN DIEGO, CA 92110	JPL GW MON 3Q08
Project Manager	**Project Number**
DAVID CONNER	G486090
Phone / **Fax**	**P.O. # / Billing Information**
619-726-7311	#214319 ATTN: GERALD TOMPKINS 505 KING AVE. COLUMBUS, OH 43201
Email Address for Result Reporting	**Sampler (Print & Sign)**

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas ☐	TPH Gas 8015B ☐ BTEX 8021B ☐ MTBE 8021B ☐	TPH Diesel 8015B ☐ (Subcontracted) TPH Diesel Low Level 8015B ☐ (Subcontracted)	TPH FC ☐ 8015M (Subcontracted)	Semi-Volatile Organics GC/MS 625 ☐ 8270C ☐ (Subcontracted)	0	Cr VI (7196)	Remarks
MW-17-4	1	7/23/08	900	W	1						X		
MW-17-3	2		950								X		
MW-17-2	3		~~1007~~ 1019 ②								X		
DUPE-3-3Q08	4		—								X		DUPLICATE
EB-04-7/23/08	5		1001								X		EQUIP. BLANK

Preservative Key

0	None
1	HCL
2	HNO3
3	H2SO4
4	NaOH
5	Zn Acetate
6	Asc Acid
7	Other

Report Tier Levels - please select

Tier I - (Results/Default if not specified) ____
Tier II - (Results + QC) ____
Tier III - (Data Validation Package) 10% Surcharge ____
Tier V - (client specified) X

MRL required Yes / No
MDL / PQL / J required Yes / No

EDD required Yes / No
Type: Excel

Project Requirements (MRLs, QAPP)

	Date	Time		Date	Time
Relinquished by: (Signature)	7/23/08	1444	Received by: (Signature)	7/24/08	744
Relinquished by: (Signature)	7/23/08	1524	Received by: (Signature)	7/23/08	1524
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Cooler / Blank / Ice / No Ice
Temperature 3 °C

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

Columbia Analytical Services INC.
An Employee - Owned Company

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

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

CAS Project No. P0802320

CAS Contact:

Company Name & Address (Reporting Information)
BATTELLE
3990 OLD TOWN AVE, C-205
SAN DIEGO, CA 92110

Project Name
JPL GW MON. 3Q08

Project Number
G486090

Project Manager
DAVID CONNER

P.O. # / Billing Information
214319/ BATTELLE
ATTN: GERALD TOMPKINS
505 KING AVE
COLUMBUS, OH 43201

Phone
~~619~~ 726-7311

Fax

Email Address for Result Reporting

Sampler (Print & Sign)

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas ☐	TPH Gas 8015B ☐ BTEX 8021B ☐ MTBE 8021B ☐	TPH Diesel 8015B ☐ (Subcontracted) TPH Diesel Low Level 8015B ☐ (Subcontracted)	TPH FC ☐ 8015M (Subcontracted)	Semi-Volatile Organics GC/MS 625 ☐ 8270C ☐ (Subcontracted)	0	Remarks
~~MW-18-5 CCD~~												
MW-18-4	6	7/23/08	1200	W	1						X	
MW-18-3	7		1229		1						X	
MW-18-2	8		1315		1						X	
DUPE-4-3Q08	9		—		1						X	DUPLICATE

Preservative Key
0 None
1 HCL
2 HNO3
3 H2SO4
4 NaOH
5 Zn Acetate
6 Asc Acid
7 Other

Report Tier Levels - please select
Tier I - (Results/Default if not specified) ____
Tier II - (Results + QC) ____
Tier III - (Data Validation Package) 10% Surcharge ____
Tier V - (client specified) X
MRL required Yes / No
MDL / PQL / J required Yes / No
EDD required Yes / No
Type: Geotracker

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date: 7/23/08	Time: 1444	Received by: (Signature)		Date: 7/23/08	Time: 1444	
Relinquished by: (Signature)	Date: 7/23/08	Time: 1524	Received by: (Signature)		Date: 7/23/08	Time: 1524	Cooler / Blank / Ice / No Ice
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)		Date:	Time:	Temperature 3 °C

Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL Groundwater Monitoring 3Q08/G486090

Service Request: P0802320

Bottle ID	Date	Time	Sample Location / User	Disposed On
P0802320-001.01	07/23/2008	1534	SMO / LKUKITA	
	07/23/2008	1548	In Lab / DCASTILLO	
	07/23/2008	1839	P-37 / DCASTILLO	
P0802320-002.01	07/23/2008	1534	SMO / LKUKITA	
	07/23/2008	1548	In Lab / DCASTILLO	
	07/23/2008	1839	P-37 / DCASTILLO	
P0802320-003.01	07/23/2008	1534	SMO / LKUKITA	
	07/23/2008	1548	In Lab / DCASTILLO	
	07/23/2008	1839	P-37 / DCASTILLO	
P0802320-004.01	07/23/2008	1534	SMO / LKUKITA	
	07/23/2008	1548	In Lab / DCASTILLO	
	07/23/2008	1839	P-37 / DCASTILLO	
P0802320-005.01	07/23/2008	1534	SMO / LKUKITA	
	07/23/2008	1548	In Lab / DCASTILLO	
	07/23/2008	1839	P-37 / DCASTILLO	
P0802320-006.01	07/23/2008	1534	SMO / LKUKITA	
	07/23/2008	1548	In Lab / DCASTILLO	
	07/23/2008	1840	P-37 / DCASTILLO	
P0802320-007.01	07/23/2008	1534	SMO / LKUKITA	
	07/23/2008	1548	In Lab / DCASTILLO	
	07/23/2008	1840	P-37 / DCASTILLO	
P0802320-008.01	07/23/2008	1534	SMO / LKUKITA	
	07/23/2008	1548	In Lab / DCASTILLO	
	07/23/2008	1840	P-37 / DCASTILLO	
P0802320-009.01	07/23/2008	1534	SMO / LKUKITA	
	07/23/2008	1548	In Lab / DCASTILLO	
	07/23/2008	1840	P-37 / DCASTILLO	

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0802320

Project: JPL Groundwater Monitoring 3Q08 / G486090

Sample(s) received on: 7/23/08 Date opened: 7/23/08 by: LKUKITA

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
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Container(s) **supplied by CAS**?	☒	☐	☐
3	Did **sample containers** arrive in good condition?	☒	☐	☐
4	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
5	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
6	Was **sample volume** received adequate for analysis?	☒	☐	☐
7	Are samples within specified holding times?	☒	☐	☐
8	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature _____ °C Blank Temperature 3 °C			
9	Was a **trip blank** received?	☐	☐	☒
	Trip blank supplied by CAS: Serial # _____ -TB _____			
10	Were **custody seals** on outside of cooler/Box?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
	Were custody seals on outside of sample container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
11	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
12	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
	Do they contain moisture?	☐	☐	☒
13	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0802320-001.01	125mL Plastic NP					
P0802320-002.01	125mL Plastic NP					
P0802320-003.01	125mL Plastic NP					
P0802320-004.01	125mL Plastic NP					
P0802320-005.01	125mL Plastic NP					
P0802320-006.01	125mL Plastic NP					
P0802320-007.01	125mL Plastic NP					

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

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

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0802320

Project: JPL Groundwater Monitoring 3Q08 / G486090

Sample(s) received on: 7/23/08 Date opened: 7/23/08 by: LKUKITA

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0802320-008.01	125mL Plastic NP					
P0802320-009.01	125mL Plastic NP					

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

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

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL Groundwater Monitoring 3Q08
Project Number : G486090
Sample Matrix : WATER

Service Request : P0802320
Date Collected : 07/23/08
Date Received : 07/23/08

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-17-4	P0802320-001	0.010	0.006	1	NA	07/23/08 17:14	ND	
MW-17-3	P0802320-002	0.010	0.006	1	NA	07/23/08 17:14	ND	
MW-17-2	P0802320-003	0.010	0.006	1	NA	07/23/08 17:14	ND	
DUPE-3-3Q08	P0802320-004	0.010	0.006	1	NA	07/23/08 17:14	ND	
EB-04-7/23/08	P0802320-005	0.010	0.006	1	NA	07/23/08 17:14	ND	
MW-18-4	P0802320-006	0.010	0.006	1	NA	07/23/08 17:14	ND	
MW-18-3	P0802320-007	0.010	0.006	1	NA	07/23/08 17:14	ND	
MW-18-2	P0802320-008	0.010	0.006	1	NA	07/23/08 17:14	ND	
DUPE-4-3Q08	P0802320-009	0.010	0.006	1	NA	07/23/08 17:14	ND	
Method Blank	P0802320-MB	0.010	0.006	1	NA	07/23/08 17:14	ND	

Approved By Sue Anderson Date : 7/31/08

Report By:DCastillo

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Batelle	**Service Request:**	P0802320
Project:	JPL Groundwater Monitoring 3Q08/G486090	**Date Analyzed:**	7/23/08

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

Approved By: _____ Date: 7/31/08

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Batelle	**Service Request:**	P0802320
Project:	JPL Groundwater Monitoring 3Q08/G486090	**Date Analyzed:**	7/23/08

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

Sample Name	True Value	Result	Percent Recovery	Acceptance Criteria
ICV	0.0418	0.0380	91	90-110
CCV1	0.0418	0.0398	95	90-110
CCV2	0.0418	0.0407	97	90-110

Approved By: Sue Anderson Date: 7/31/08

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P0802320
Project Name :	JPL Groundwater Monitoring 3Q08	**Date Collected :**	NA
Project Number :	G486090	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	07/23/08

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P0802320-LCS	Basis :	NA
Test Notes :			

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.040	0.0415	104	92-113	

Approved By Sue Anderson Date : 7/31/08

Report By:DCastillo

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P0802320
Project Name :	JPL Groundwater Monitoring 3Q08	**Date Collected :**	07/23/08
Project Number :	G486090	**Date Received :**	07/23/08
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	07/23/08

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name :	MW-17-4		Units :	mg/L (ppm)
Lab Code :	P0802320-001MS	P0802320-001DMS	Basis :	NA
Test Notes :				

Analyte	Prep Method	Analysis Method	PQL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Spike Recovery MS	Spike Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.050	0.050	ND	0.0476	0.0485	95	97	82-114	2	

Approved By Sue Quilerta Date : 7/31/08

Report By:DCastillo

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

Columbia Analytical Services INC.
An Employee - Owned Company

CAS SR #P0802352

Table of Contents

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

Columbia Analytical Services INC.
An Employee - Owned Company

LABORATORY REPORT

August 4, 2008

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

RE: JPL Groundwater Monitoring 3Q08 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on July 25, 2008. For your reference, these analyses have been assigned our service request number P0802352.

All analyses were performed in accordance with our laboratory's quality assurance program. 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. 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.

Sue Anderson
Project Manager

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

Columbia Analytical Services INC.
An Employee - Owned Company

Client: Battelle CAS Project No: P0802352
Project: JPL Groundwater Monitoring 3Q08 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on July 25, 2008 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 3Q08/G486090

Service Request: P0802352

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P0802352-001	MW-20-5	07/25/08	07:47
P0802352-002	MW-20-4	07/25/08	08:26
P0802352-003	MW-20-3	07/25/08	08:56
P0802352-004	MW-20-2	07/25/08	09:23
P0802352-005	MW-20-1	07/25/08	09:50
P0802352-006	EB-05-7/25/08	07/25/08	09:38

Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl *tert*-Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
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 INC.
An Employee - Owned Company

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

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

CAS Project No. P0802352

CAS Contact:

Company Name & Address (Reporting Information)	Project Name
BATTELLE 3990 OLD TOWN AVE, C-205 SAN DIEGO, CA 92110	JPL GW MON 3208
	Project Number La486090
Project Manager DAVID CONNER	P.O. # / Billing Information #214319 ATTN: GERALD TOMPKINS 505 KING AVE. COLUMBUS OH 43201
Phone 619-726-7311	Fax
Email Address for Result Reporting	Sampler (Print & Sign)

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas ☐	TPH Gas 8015B ☐ BTEX 8021B ☐ MTBE 8021B ☐	TPH Diesel 8015B ☐ (Subcontracted) TPH Diesel Low Level 8015B ☐ (Subcontracted)	TPH FC ☐ 8015M (Subcontracted)	Semi-Volatile Organics GC/MS 625 ☐ 8270C ☐ (Subcontracted)	6 Cr VI (7196)	Remarks
MW-20-5	1	7/25/08	747	W	1						X	
MW-20-4	2		826								X	QC LEVEL IV
MW-20-3	3		856								X	
MW-20-2	4		923								X	
MW-20-1	5		950								X	
EB-05-7/25/08	6		928								X	EQUIP. BLANK

Preservative Key

0	None
1	HCL
2	HNO3
3	H2SO4
4	NaOH
5	Zn Acetate
6	Asc Acid
7	Other

Report Tier Levels - please select

Tier I - (Results/Default if not specified) ____
Tier II - (Results + QC) ____
Tier III - (Data Validation Package) 10% Surcharge ____
Tier V - (client specified) X

MRL required Yes / No
MDL / PQL / J required Yes / No

EDD required Yes / No
Type: Geotracker

Project Requirements (MRLs, QAPP)

	Date	Time		Date	Time
Relinquished by: (Signature)	7/25/08	1150	Received by: (Signature)	7/25/08	1150
Relinquished by: (Signature)	7/25/08	1750	Received by: (Signature)	7/25/08	1150
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Cooler / Blank / Ice / No Ice
Temperature 3 °C

Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL Groundwater Monitoring 3Q08/G486090

Service Request: P0802352

Bottle ID	Date	Time	Sample Location / User	Disposed On
P0802352-001.01	07/25/2008	1148	SMO / LKUKITA	
	07/25/2008	1203	In Lab / SANDERSON	
	07/25/2008	1519	P-37 / NFALLAHI	
P0802352-002.01	07/25/2008	1148	SMO / LKUKITA	
	07/25/2008	1203	In Lab / SANDERSON	
	07/25/2008	1519	P-37 / NFALLAHI	
P0802352-003.01	07/25/2008	1148	SMO / LKUKITA	
	07/25/2008	1203	In Lab / SANDERSON	
	07/25/2008	1519	P-37 / NFALLAHI	
P0802352-004.01	07/25/2008	1148	SMO / LKUKITA	
	07/25/2008	1203	In Lab / SANDERSON	
	07/25/2008	1519	P-37 / NFALLAHI	
P0802352-005.01	07/25/2008	1148	SMO / LKUKITA	
	07/25/2008	1203	In Lab / SANDERSON	
	07/25/2008	1519	P-37 / NFALLAHI	
P0802352-006.01	07/25/2008	1148	SMO / LKUKITA	
	07/25/2008	1203	In Lab / SANDERSON	
	07/25/2008	1519	P-37 / NFALLAHI	

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0802352

Project: JPL Groundwater Monitoring 3Q08 / G486090

Sample(s) received on: 7/25/08 Date opened: 7/25/08 by: LKUKITA

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
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Container(s) **supplied by CAS**?	☒	☐	☐
3	Did **sample containers** arrive in good condition?	☒	☐	☐
4	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
5	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
6	Was **sample volume** received adequate for analysis?	☒	☐	☐
7	Are samples within specified holding times?	☒	☐	☐
8	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature _____ °C Blank Temperature 3 °C			
9	Was a **trip blank** received?	☐	☐	☒
	Trip blank supplied by CAS: Serial # _____ -TB _____			
10	Were **custody seals** on outside of cooler/Box?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
	Were custody seals on outside of sample container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
11	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
12	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
	Do they contain moisture?	☐	☐	☒
13	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0802352-001.01	125mL Plastic NP					
P0802352-002.01	125mL Plastic NP					
P0802352-003.01	125mL Plastic NP					
P0802352-004.01	125mL Plastic NP					
P0802352-005.01	125mL Plastic NP					
P0802352-006.01	125mL Plastic NP					

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

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

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL Groundwater Monitoring 3Q08
Project Number : G486090
Sample Matrix : WATER

Service Request : P0802352
Date Collected : 07/25/08
Date Received : 07/25/08

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-20-5	P0802352-001	0.010	0.006	1	NA	07/25/08 14:25	ND	
MW-20-4	P0802352-002	0.010	0.006	1	NA	07/25/08 14:25	ND	
MW-20-3	P0802352-003	0.010	0.006	1	NA	07/25/08 14:25	ND	
MW-20-2	P0802352-004	0.010	0.006	1	NA	07/25/08 14:25	ND	
MW-20-1	P0802352-005	0.010	0.006	1	NA	07/25/08 14:25	ND	
EB-05-7/25/08	P0802352-006	0.010	0.006	1	NA	07/25/08 14:25	ND	
Method Blank	P0802352-MB	0.010	0.006	1	NA	07/25/08 14:25	ND	

Approved By _____ Date : 8/4/08

Report By:NFallahi

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL Groundwater Monitoring 3Q08 / G486090

Service Request: P0802352
Date Analyzed: 7/25/08

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: _____ Date: 8/4/08

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL Groundwater Monitoring 3Q08 / G486090

Service Request: P0802352
Date Analyzed: 7/25/08

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	0.0402	96
CCV1	0.0418	0.0393	94

Approved By: _____ Date: 8/4/08

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P0802352
Project Name :	JPL Groundwater Monitoring 3Q08	**Date Collected :**	NA
Project Number :	G486090	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	07/25/08

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P0802352-LCS	Basis :	NA
Test Notes :			

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.040	0.0383	96	92-113	

Approved By Sue Anderson Date : 8/4/08

Report By:NFallahi

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle
Project Name : JPL Groundwater Monitoring 3Q08
Project Number : G486090
Sample Matrix : WATER

Service Request : P0802352
Date Collected : 07/25/08
Date Received : 07/25/08
Date Extracted : NA
Date Analyzed : 07/25/08

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-20-4
Lab Code : P0802352-002MS P0802352-002DMS
Test Notes :

Units : mg/L (ppm)
Basis : NA

Analyte	Prep Method	Analysis Method	PQL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Spike Recovery MS	Spike Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.050	0.050	ND	0.0470	0.0470	94	94	82-114	<1	

Approved By _____ Date : 8/4/08

Report By:NFallahi

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

Columbia Analytical Services INC.
An Employee - Owned Company

CAS SR #P0802370

Table of Contents

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

Columbia Analytical Services INC.
An Employee - Owned Company

LABORATORY REPORT

August 8, 2008

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

RE: JPL Groundwater Monitoring 3Q08 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on July 28, 2008. For your reference, these analyses have been assigned our service request number P0802370.

All analyses were performed in accordance with our laboratory's quality assurance program. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains 27 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. 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.

Sue Anderson
Project Manager

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

Columbia Analytical Services INC.
An Employee - Owned Company

Client: Battelle CAS Project No: P0802370
Project: JPL Groundwater Monitoring 3Q08 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on July 28, 2008 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 3Q08/G486090

Service Request: P0802370

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P0802370-001	MW-3-4	07/28/08	11:12
P0802370-002	MW-3-3	07/28/08	11:59
P0802370-003	MW-3-2	07/28/08	12:28
P0802370-004	MW-4-3	07/28/08	08:23
P0802370-005	MW-4-2	07/28/08	09:15
P0802370-006	MW-4-1	07/28/08	09:50
P0802370-007	DUPE-5-3Q08	07/28/08	00:00
P0802370-008	EB-06-7/28/08	07/28/08	09:40

Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl *tert*-Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
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 INC.
An Employee - Owned Company

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

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

CAS Project No. P0802370

CAS Contact:

Company Name & Address (Reporting Information)	Project Name
BATTELLE 3990 OLD TOWN AVE, C-205 SAN DIEGO, CA 92110	SPL GW MON 3Q08
	Project Number G486090
Project Manager DAVID CONNER	P.O. # / Billing Information 214319/BATTELLE ATTN: GERALD TOMPKINS 505 KING AVE. COLUMBUS, OH 43201
Phone 619-726-7311	Fax
Email Address for Result Reporting	Sampler (Print & Sign)

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas ☐	TPH Gas 8015B ☐ BTEX 8021B ☐ MTBE 8021B ☐	TPH Diesel 8015B ☐ (Subcontracted)	TPH Diesel Low Level 8015B ☐ (Subcontracted)	TPH FC ☐ 8015M (Subcontracted)	Semi-Volatile Organics GC/MS 625 ☐ 8270C ☐ (Subcontracted)	0	Cr III (7198)	Remarks
MW-3-4	1	7/28/08	1112	W	2							X		MS/MSD
MW-3-3	2		1159		1							X		
MW-3-2	3		1226		1							X		

Preservative Key

0	None
1	HCL
2	HNO3
3	H2SO4
4	NaOH
5	Zn Acetate
6	Asc Acid
7	Other

Report Tier Levels - please select

Tier I - (Results/Default if not specified) ____
Tier II - (Results + QC) ____
Tier III - (Data Validation Package) 10% Surcharge ____
Tier V - (client specified) X

MRL required Yes / No
MDL / PQL / J required Yes / No

EDD required Yes / No
Type: Geotracker

Project Requirements (MRLs, QAPP)

	Date	Time	Received by: (Signature)	Date	Time
Relinquished by: (Signature)	7/24/08	1930			
Relinquished by: (Signature)	7/25/08	1117	Received by: (Signature)	7/28/08	1409
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Cooler / Blank / Ice / No Ice
Temperature 3 °C

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

Page 1 of 1

Columbia Analytical Services INC.
An Employee - Owned Company

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

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

CAS Project No: P0802370

CAS Contact:

Company Name & Address (Reporting Information)	Project Name	Project Manager	Phone	Fax
BATTELLE 3990 OLD TOWN AVE, C-205 SAN DIEGO, CA 92110	JPL GW MON 3Q08 Project Number: G4486090	DAVID CONNER	619-726-7311	

P.O. # / Billing Information: 214319/ BATTELLE ATTN: GERALD TOMPKINS 505 KING AVE. COLUMBUS, OH 43201

Email Address for Result Reporting:

Sampler (Print & Sign):

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas ☐	TPH Gas 8015B ☐ BTEX 8021B ☐ MTBE 8021B ☐	TPH Diesel 8015B ☐ (Subcontracted) TPH Diesel Low Level 8015B ☐ (Subcontracted)	TPH FC ☐ 8015M (Subcontracted)	Semi-Volatile Organics GC/MS 625 ☐ 8270C ☐ (Subcontracted)	0 / CrVI (7196)	Remarks
MW-4-3	4	7/28/08	0823	W	1						X	
MW-4-2	5		0915		1						X	
MW-4-1	6		0950		1						X	
DUPE-5-3Q08	7		—		1						X	DUPLICATE
EB-01-7/28/08	8		0940		1						X	EQUIP. BLANK

Preservative Key

0	None
1	HCL
2	HNO3
3	H2SO4
4	NaOH
5	Zn Acetate
6	Asc Acid
7	Other

Report Tier Levels - please select

Tier I - (Results/Default if not specified) ____
Tier II - (Results + QC) ____
Tier III - (Data Validation Package) 10% Surcharge ____
Tier V - (client specified) X

MRL required Yes / No
MDL / PQL / J required Yes / No

EDD required Yes / No
Type: Geotracker

Project Requirements (MRLs, QAPP)

	Date	Time		Date	Time
Relinquished by: (Signature)	7/28/08	1330	Received by: (Signature)		
Relinquished by: (Signature)	7/28/08	1740	Received by: (Signature)	7/29/08	1459
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Cooler / Blank / Ice / No Ice

Temperature 3 °C

Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL Groundwater Monitoring 3Q08/G486090

Service Request: P0802370

Bottle ID	Date	Time	Sample Location / User	Disposed On
P0802370-001.01	07/28/2008	1418	SMO / LKUKITA	
	07/28/2008	1452	In Lab / NFALLAHI	
	07/28/2008	1828	P-37 / DCASTILLO	
P0802370-001.02	07/28/2008	1418	SMO / LKUKITA	
	07/28/2008	1452	In Lab / NFALLAHI	
	07/28/2008	1828	P-37 / DCASTILLO	
P0802370-002.01	07/28/2008	1418	SMO / LKUKITA	
	07/28/2008	1452	In Lab / NFALLAHI	
	07/28/2008	1828	P-37 / DCASTILLO	
P0802370-003.01	07/28/2008	1418	SMO / LKUKITA	
	07/28/2008	1452	In Lab / NFALLAHI	
	07/28/2008	1828	P-37 / DCASTILLO	
P0802370-004.01	07/28/2008	1418	SMO / LKUKITA	
	07/28/2008	1452	In Lab / NFALLAHI	
	07/28/2008	1828	P-37 / DCASTILLO	
P0802370-005.01	07/28/2008	1418	SMO / LKUKITA	
	07/28/2008	1452	In Lab / NFALLAHI	
	07/28/2008	1828	P-37 / DCASTILLO	
P0802370-006.01	07/28/2008	1418	SMO / LKUKITA	
	07/28/2008	1451	In Lab / NFALLAHI	
	07/28/2008	1828	P-37 / DCASTILLO	
P0802370-007.01	07/28/2008	1418	SMO / LKUKITA	
	07/28/2008	1451	In Lab / NFALLAHI	
	07/28/2008	1828	P-37 / DCASTILLO	
P0802370-008.01	07/28/2008	1418	SMO / LKUKITA	
	07/28/2008	1451	In Lab / NFALLAHI	
	07/28/2008	1828	P-37 / DCASTILLO	

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0802370

Project: JPL Groundwater Monitoring 3Q08 / G486090

Sample(s) received on: 7/28/08 Date opened: 7/28/08 by: LKUKITA

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
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Container(s) **supplied by CAS**?	☒	☐	☐
3	Did **sample containers** arrive in good condition?	☒	☐	☐
4	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
5	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
6	Was **sample volume** received adequate for analysis?	☒	☐	☐
7	Are samples within specified holding times?	☒	☐	☐
8	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature _____ °C Blank Temperature 3 °C			
9	Was a **trip blank** received?	☐	☐	☒
	Trip blank supplied by CAS: Serial # _____ -TB _____			
10	Were **custody seals** on outside of cooler/Box?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
	Were custody seals on outside of sample container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
11	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
12	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
	Do they contain moisture?	☐	☐	☒
13	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0802370-001.01	125mL Plastic NP					
P0802370-001.02	125mL Plastic NP					
P0802370-002.01	125mL Plastic NP					
P0802370-003.01	125mL Plastic NP					
P0802370-004.01	125mL Plastic NP					
P0802370-005.01	125mL Plastic NP					
P0802370-006.01	125mL Plastic NP					

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

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

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0802370

Project: JPL Groundwater Monitoring 3Q08 / G486090

Sample(s) received on: 7/28/08 Date opened: 7/28/08 by: LKUKITA

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0802370-007.01	125mL Plastic NP					
P0802370-008.01	125mL Plastic NP					

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

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

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL Groundwater Monitoring 3Q08
Project Number : G486090
Sample Matrix : WATER

Service Request : P0802370
Date Collected : 07/28/08
Date Received : 07/28/08

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-3-4	P0802370-001	0.010	0.006	1	NA	07/28/08 17:15	ND	
MW-3-3	P0802370-002	0.010	0.006	1	NA	07/28/08 17:15	ND	
MW-3-2	P0802370-003	0.010	0.006	1	NA	07/28/08 17:15	ND	
MW-4-3	P0802370-004	0.010	0.006	1	NA	07/28/08 17:15	ND	
MW-4-2	P0802370-005	0.010	0.006	1	NA	07/28/08 17:15	ND	
MW-4-1	P0802370-006	0.010	0.006	1	NA	07/28/08 17:15	ND	
DUPE-5-3Q08	P0802370-007	0.010	0.006	1	NA	07/28/08 17:15	ND	
EB-06-7/28/08	P0802370-008	0.010	0.006	1	NA	07/28/08 17:15	ND	
Method Blank	P0802370-MB	0.010	0.006	1	NA	07/28/08 17:15	ND	

Approved By _____ Date : 8/8/08

Report By:NFallahi

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P0802370
Project:	JPL Groundwater Monitoring 3Q08 / G486090	**Date Analyzed:**	7/28/08

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

Approved By: _____ Date: 8/8/08

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P0802370
Project:	JPL Groundwater Monitoring 3Q08 / G486090	**Date Analyzed:**	7/28/08

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	0.0446	107
CCV1	0.0418	0.0404	97
CCV2	0.0418	0.0404	97

Approved By: _____ Date: 8/8/08

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P0802370
Project Name :	JPL Groundwater Monitoring 3Q08	**Date Collected :**	NA
Project Number :	G486090	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	07/28/08

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P0802370-LCS	Basis :	NA
Test Notes :			

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.040	0.0375	94	92-113	

Approved By Sue Anderson Date : 8/8/08

Report By:NFallahi

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P0802370
Project Name :	JPL Groundwater Monitoring 3Q08	**Date Collected :**	07/28/08
Project Number :	G486090	**Date Received :**	07/28/08
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	07/28/08

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-3-4 Units : mg/L (ppm)
Lab Code : P0802370-001MS P0802370-001DMS Basis : NA
Test Notes :

Analyte	Prep Method	Analysis Method	PQL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Spike Recovery MS	Spike Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.050	0.050	ND	0.0425	0.0460	85	92	82-114	8	

Approved By _____ Date : 8/8/08

Report By:NFallahi

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

Columbia Analytical Services INC.
An Employee - Owned Company

CAS SR #P0802384

Table of Contents

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

Columbia Analytical Services INC.
An Employee - Owned Company

LABORATORY REPORT

August 8, 2008

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

RE: JPL Groundwater Monitoring 3Q08 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on July 29, 2008. For your reference, these analyses have been assigned our service request number P0802384.

All analyses were performed in accordance with our laboratory's quality assurance program. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains 26 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. 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.

Sue Anderson
Project Manager

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

Columbia Analytical Services INC.
An Employee - Owned Company

Client: Battelle CAS Project No: P0802384
Project: JPL Groundwater Monitoring 3Q08 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on July 29, 2008 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 3Q08/G486090

Service Request: P0802384

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P0802384-001	MW-23-4	07/29/08	07:56
P0802384-002	MW-23-3	07/29/08	08:45
P0802384-003	MW-23-2	07/29/08	09:34
P0802384-004	MW-23-1	07/29/08	10:01
P0802384-005	EB-07-07/29/08	07/29/08	09:24

Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl *tert*-Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
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 INC.
An Employee - Owned Company

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

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

CAS Project No. P0802304

CAS Contact:

Company Name & Address (Reporting Information)
BATTELLE
3990 OLD TOWN AVE, C-205
SAN DIEGO, CA 92110

Project Name
JPL GW MON. 3Q08

Project Number
G486090

Project Manager
DAVID CONNER

P.O. # / Billing Information
#214319
ATTN: GERALD TOMPKINS
505 KING AVE.
COLUMBUS, OH 43201

Phone
619-726-7311

Fax

Email Address for Result Reporting

Sampler (Print & Sign)

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas ☐	TPH Gas 8015B ☐ BTEX 8021B ☐ MTBE 8021B ☐	TPH Diesel 8015B ☐ (Subcontracted)	TPH Diesel Low Level 8015B ☐ (Subcontracted)	TPH FC ☐ 8015M (Subcontracted)	Semi-Volatile Organics GC/MS 625 ☐ 8270C ☐ (Subcontracted)	C-II (6196)											Remarks
MW-23-4	1	7/29/08	0756	W	1							X											
MW-23-3	2		0845		2							X											MS/MSD
MW-23-2	3		0934		1							X											
MW-23-1	4		1001									X											
EB-07/-07/29/08	5		0924									X											EQUIPMENT BLANK

Preservative Key

0	None
1	HCL
2	HNO3
3	H2SO4
4	NaOH
5	Zn Acetate
6	Asc Acid
7	Other

Report Tier Levels - please select

Tier I - (Results/Default if not specified) ____
Tier II - (Results + QC) ____
Tier III - (Data Validation Package) 10% Surcharge ____
Tier V - (client specified) X

MRL required Yes / No
MDL / PQL / J required Yes / No
EDD required Yes / No
Type: _____

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)		Date: 7/29/08	Time: 1130	Received by: (Signature)		Date: 7/29/08	Time: 11:30
Relinquished by: (Signature)		Date: 7/29/08	Time: 12:05	Received by: (Signature)		Date: 7/30/08	Time: 1200
Relinquished by: (Signature)		Date:	Time:	Received by: (Signature)		Date:	Time:

Cooler / Blank / Ice / No Ice
Temperature 3 °C

Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL Groundwater Monitoring 3Q08/G486090

Service Request: P0802384

Bottle ID	Date	Time	Sample Location / User	Disposed On
P0802384-001.01	07/29/2008	1336	SMO / LKUKITA	
	07/29/2008	1349	In Lab / NFALLAHI	
	07/29/2008	1717	P-37 / DCASTILLO	
P0802384-002.01	07/29/2008	1336	SMO / LKUKITA	
	07/29/2008	1349	In Lab / NFALLAHI	
	07/29/2008	1717	P-37 / DCASTILLO	
P0802384-002.02	07/29/2008	1337	SMO / LKUKITA	
	07/29/2008	1349	In Lab / NFALLAHI	
	07/29/2008	1717	P-37 / DCASTILLO	
P0802384-003.01	07/29/2008	1336	SMO / LKUKITA	
	07/29/2008	1349	In Lab / NFALLAHI	
	07/29/2008	1717	P-37 / DCASTILLO	
P0802384-004.01	07/29/2008	1336	SMO / LKUKITA	
	07/29/2008	1349	In Lab / NFALLAHI	
	07/29/2008	1717	P-37 / DCASTILLO	
P0802384-005.01	07/29/2008	1336	SMO / LKUKITA	
	07/29/2008	1349	In Lab / NFALLAHI	
	07/29/2008	1717	P-37 / DCASTILLO	

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0802384

Project: JPL Groundwater Monitoring 3Q08 / G486090

Sample(s) received on: 7/29/08 Date opened: 7/29/08 by: LKUKITA

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
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Container(s) **supplied by CAS**?	☒	☐	☐
3	Did **sample containers** arrive in good condition?	☒	☐	☐
4	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
5	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
6	Was **sample volume** received adequate for analysis?	☒	☐	☐
7	Are samples within specified holding times?	☒	☐	☐
8	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature _____ °C Blank Temperature 3 °C			
9	Was a **trip blank** received?	☐	☐	☒
	Trip blank supplied by CAS: Serial # _____ -TB _____			
10	Were **custody seals** on outside of cooler/Box?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
	Were custody seals on outside of sample container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
11	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☐	☐	☒
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
12	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
	Do they contain moisture?	☐	☐	☒
13	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0802384-001.01	125mL Plastic NP					
P0802384-002.01	125mL Plastic NP					
P0802384-002.02	125mL Plastic NP					
P0802384-003.01	125mL Plastic NP					
P0802384-004.01	125mL Plastic NP					
P0802384-005.01	125mL Plastic NP					

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

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

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL Groundwater Monitoring 3Q08
Project Number : G486090
Sample Matrix : WATER

Service Request : P0802384
Date Collected : 07/29/08
Date Received : 07/29/08

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-23-4	P0802384-001	0.010	0.006	1	7/29/08	07/29/08 15:18	ND	
MW-23-3	P0802384-002	0.010	0.006	1	7/29/08	07/29/08 15:18	ND	
MW-23-2	P0802384-003	0.010	0.006	1	7/29/08	07/29/08 15:18	ND	
MW-23-1	P0802384-004	0.010	0.006	1	7/29/08	07/29/08 15:18	ND	
EB-07-07/29/08	P0802384-005	0.010	0.006	1	7/29/08	07/29/08 15:18	ND	
Method Blank	P0802384-MB	0.010	0.006	1	7/29/08	07/29/08 15:18	ND	

Approved By  Date : 8/8/08

Report By:NFallahi

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P0802384
Project:	JPL Groundwater Monitoring 3Q08 / G486090	**Date Analyzed:**	7/29/08

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: _____ Date: 8/8/08

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL Groundwater Monitoring 3Q08 / G486090

Service Request: P0802384
Date Analyzed: 7/29/08

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	0.0402	96
CCV1	0.0418	0.0433	94

Approved By: _____ Date: 8/8/08

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P0802384
Project Name :	JPL Groundwater Monitoring 3Q08	**Date Collected :**	NA
Project Number :	G486090	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	07/29/08
		Date Analyzed :	07/29/08

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P0802384-LCS	Basis :	NA
Test Notes :			

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.040	0.0402	101	92-113	

Approved By Joe Quilera Date : 8/8/08

Report By:NFallahi

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P0802384
Project Name :	JPL Groundwater Monitoring 3Q08	**Date Collected :**	07/29/08
Project Number :	G486090	**Date Received :**	07/29/08
Sample Matrix :	WATER	**Date Extracted :**	07/29/08
		Date Analyzed :	07/29/08

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name :	MW-23-3		Units :	mg/L (ppm)
Lab Code :	P0802384-002MS	P0802384-002DMS	Basis :	NA
Test Notes :				

Analyte	Prep Method	Analysis Method	PQL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Spike Recovery MS	Spike Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.050	0.050	ND	0.0464	0.0464	93	93	82-114		

Approved By _____ Date : 8/8/08

Report By:NFallahi

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

Columbia Analytical Services INC.
An Employee - Owned Company

CAS SR #P0802406

Table of Contents

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

Columbia Analytical Services INC.
An Employee - Owned Company

LABORATORY REPORT

August 8, 2008

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

RE: JPL Groundwater Monitoring 3Q08 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on July 30, 2008. For your reference, these analyses have been assigned our service request number P0802406.

All analyses were performed in accordance with our laboratory's quality assurance program. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains 29 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. 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.

Sue Anderson
Project Manager

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

Columbia Analytical Services INC.
An Employee - Owned Company

Client: Battelle CAS Project No: P0802406
Project: JPL Groundwater Monitoring 3Q08 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on July 30, 2008 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 3Q08/G486090

Service Request: P0802406

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P0802406-001	MW-11-3	07/30/08	11:57
P0802406-002	MW-11-2	07/30/08	12:37
P0802406-003	MW-11-1	07/30/08	13:34
P0802406-004	MW-22-3	07/30/08	08:02
P0802406-005	MW-22-2	07/30/08	08:35
P0802406-006	MW-22-1	07/30/08	09:16
P0802406-007	EB-08-07/30/08	07/30/08	08:59

Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl *tert*-Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
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 INC.
An Employee - Owned Company

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

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

CAS Project No. P0802406

CAS Contact:

Company Name & Address (Reporting Information)
BATTELLE
3990 OLD TOWN AVE, C-205
SAN DIEGO, CA ~~92110~~ 92110

Project Name
JPL GW MON 3Q08

Project Number
G486090

Project Manager
DAVID CONNER

P.O. # / Billing Information
214319/BATTELLE
ATTN: GERALD TOMPKINS
505 KING AVE.
COLUMBUS, OH 43201

Phone
619-726-7311

Fax

Email Address for Result Reporting

Sampler (Print & Sign)

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas ☐	TPH Gas 8015B ☐ BTEX 8021B ☐ MTBE 8021B ☐	TPH Diesel 8015B ☐ (Subcontracted)	TPH Diesel Low Level 8015B ☐ (Subcontracted)	TPH FC ☐ 8015M (Subcontracted)	Semi-Volatile Organics GC/MS 625 ☐ 8270C ☐ (Subcontracted)	0 Cr VI (7196)	Remarks
~~MW-11-4 (EB)~~		/ / 08		W									(2)
MW-11-3	1	07/30/08	1157	W	1							X	QC LEVEL IV
MW-11-2	2	07/30/08	1237	W	2							X	MS/MSD
MW-11-1	3	07/30/08	1334	W	1							X	

Preservative Key

0	None
1	HCL
2	HNO3
3	H2SO4
4	NaOH
5	Zn Acetate
6	Asc Acid
7	Other

Report Tier Levels - please select

Tier I - (Results/Default if not specified) ____
Tier II - (Results + QC) ____
Tier III - (Data Validation Package) 10% Surcharge ____
Tier V - (client specified) ____

MRL required Yes / No
MDL / PQL / J required Yes / No

EDD required Yes / No
Type: Electronic

Project Requirements (MRLs, QAPP)

	Date	Time		Date	Time
Relinquished by: (Signature)	7/30/08	1430	Received by: (Signature)	7/30/08	1430
Relinquished by: (Signature)	7/30/08	15:11	Received by: (Signature)	7/30/08	1510
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Cooler / Blank / Ice / No Ice
Temperature 3 °C

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

Page 1 of 1

Columbia Analytical Services INC.
An Employee - Owned Company

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

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

CAS Project No. P0802406

CAS Contact:

Company Name & Address (Reporting Information)
BATTELLE
3990 OLD TOWN AVE, C-205
SAN DIEGO, CA 92110

Project Name
JPL GW MON. 2008

Project Number
G486090

Project Manager
DAVID CONNER

P.O. # / Billing Information
214319/BATTELLE
ATTN: GERALD TOMPKINS
505 KING AVE.
COLUMBUS, OH 43201

Phone
619-726-7311

Fax

Email Address for Result Reporting

Sampler (Print & Sign)

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas ☐	TPH Gas 8015B ☐ BTEX 8021B ☐ MTBE 8021B ☐	TPH Diesel 8015B ☐ (Subcontracted)	TPH Diesel Low Level 8015B ☐ (Subcontracted)	TPH FC ☐ 8015M (Subcontracted)	Semi-Volatile Organics GC/MS 625 ☐ 8270C ☐ (Subcontracted)	0	Cr VI (7196)	Remarks
MW-22-3	4	7/30/08	0802	W	1							X		QC LEVEL IV
MW-22-2	5		0835									X		
MW-22-1	6		0916		~~2~~ 3							X		MS/MSD
EB-08 07/30/08	7		0859		1							X		EQUIPMENT BLANK
	7/30/08													

Preservative Key

0	None
1	HCL
2	HNO3
3	H2SO4
4	NaOH
5	Zn Acetate
6	Asc Acid
7	Other

Report Tier Levels - please select

Tier I - (Results/Default if not specified) ____
Tier II - (Results + QC) ____
Tier III - (Data Validation Package) 10% Surcharge ____
Tier V - (client specified) ____

MRL required Yes / No
MDL / PQL / J required Yes / No

EDD required Yes / No
Type: Excel

Project Requirements (MRLs, QAPP)

	Date	Time		Date	Time
Relinquished by: (Signature)	7/30/08	1430	Received by: (Signature)	7/30/08	1430
Relinquished by: (Signature)	7/30/08	1515	Received by: (Signature)	7/30/08	1510
Relinquished by: (Signature)			Received by: (Signature)		

Cooler / Blank / Ice / No Ice
Temperature 3 °C

Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL Groundwater Monitoring 3Q08/G486090

Service Request: P0802406

Bottle ID	Date	Time	Sample Location / User	Disposed On
P0802406-001.01	07/30/2008	1517	SMO / LKUKITA	
	07/30/2008	1527	In Lab / DCASTILLO	
	07/30/2008	1638	P-37 / DCASTILLO	
P0802406-002.01	07/30/2008	1517	SMO / LKUKITA	
	07/30/2008	1527	In Lab / DCASTILLO	
	07/30/2008	1639	P-37 / DCASTILLO	
P0802406-002.02	07/30/2008	1521	SMO / LKUKITA	
	07/30/2008	1527	In Lab / DCASTILLO	
	07/30/2008	1638	P-37 / DCASTILLO	
P0802406-003.01	07/30/2008	1517	SMO / LKUKITA	
	07/30/2008	1527	In Lab / DCASTILLO	
	07/30/2008	1638	P-37 / DCASTILLO	
P0802406-004.01	07/30/2008	1517	SMO / LKUKITA	
	07/30/2008	1527	In Lab / DCASTILLO	
	07/30/2008	1639	P-37 / DCASTILLO	
P0802406-005.01	07/30/2008	1517	SMO / LKUKITA	
	07/30/2008	1527	In Lab / DCASTILLO	
	07/30/2008	1639	P-37 / DCASTILLO	
P0802406-006.01	07/30/2008	1517	SMO / LKUKITA	
	07/30/2008	1527	In Lab / DCASTILLO	
	07/30/2008	1638	P-37 / DCASTILLO	
P0802406-006.02	07/30/2008	1521	SMO / LKUKITA	
	07/30/2008	1527	In Lab / DCASTILLO	
	07/30/2008	1639	P-37 / DCASTILLO	
P0802406-007.01	07/30/2008	1517	SMO / LKUKITA	
	07/30/2008	1527	In Lab / DCASTILLO	
	07/30/2008	1639	P-37 / DCASTILLO	

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0802406

Project: JPL Groundwater Monitoring 3Q08 / G486090

Sample(s) received on: 7/30/08 Date opened: 7/30/08 by: LKUKITA

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
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Container(s) **supplied by CAS**?	☒	☐	☐
3	Did **sample containers** arrive in good condition?	☒	☐	☐
4	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
5	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
6	Was **sample volume** received adequate for analysis?	☒	☐	☐
7	Are samples within specified holding times?	☒	☐	☐
8	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature _____ °C Blank Temperature 3 °C			
9	Was a **trip blank** received?	☐	☐	☒
	Trip blank supplied by CAS: Serial # _____ -TB _____			
10	Were **custody seals** on outside of cooler/Box?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
	Were custody seals on outside of sample container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
11	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
12	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
	Do they contain moisture?	☐	☐	☒
13	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0802406-001.01	125mL Plastic NP					
P0802406-002.01	125mL Plastic NP					
P0802406-002.02	125mL Plastic NP					
P0802406-003.01	125mL Plastic NP					
P0802406-004.01	125mL Plastic NP					
P0802406-005.01	125mL Plastic NP					
P0802406-006.01	125mL Plastic NP					

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

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

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0802406

Project: JPL Groundwater Monitoring 3Q08 / G486090

Sample(s) received on: 7/30/08 Date opened: 7/30/08 by: LKUKITA

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0802406-006.02	125mL Plastic NP					
P0802406-007.01	125mL Plastic NP					

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

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

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL Groundwater Monitoring 3Q08
Project Number : G486090
Sample Matrix : WATER

Service Request : P0802406
Date Collected : 07/30/08
Date Received : 07/30/08

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-11-3	P0802406-001	0.010	0.006	1	7/30/2008	07/30/08 16:05	ND	
MW-11-2	P0802406-002	0.010	0.006	1	7/30/2008	07/30/08 16:05	ND	
MW-11-1	P0802406-003	0.010	0.006	1	7/30/2008	07/30/08 16:05	ND	
MW-22-3	P0802406-004	0.010	0.006	1	7/30/2008	07/30/08 16:05	ND	
MW-22-2	P0802406-005	0.010	0.006	1	7/30/2008	07/30/08 16:05	ND	
MW-22-1	P0802406-006	0.010	0.006	1	7/30/2008	07/30/08 16:05	ND	
EB-08-07/30/08	P0802406-007	0.010	0.006	1	7/30/2008	07/30/08 16:05	ND	
Method Blank	P0802406-MB	0.010	0.006	1	7/30/2008	07/30/08 16:05	ND	

Approved By _____ Date : 8/8/08

Report By:NFallahi

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P0802406
Project:	JPL Groundwater Monitoring 3Q08 / G486090	**Date Analyzed:**	7/30/08

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

Approved By: _____ Date: 8/8/08

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P0802406
Project:	JPL Groundwater Monitoring 3Q08 / G486090	**Date Analyzed:**	7/30/08

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	0.0443	106
CCV1	0.0418	0.0436	104
CCV2	0.0418	0.0417	100

Approved By: _____ Date: 8/8/08

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P0802406
Project Name :	JPL Groundwater Monitoring 3Q08	**Date Collected :**	NA
Project Number :	G486090	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	07/30/08
		Date Analyzed :	07/30/08

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P0802406-LCS	Basis :	NA
Test Notes :			

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.040	0.0383	96	92-113	

Approved By Sue Anderson Date : 8/8/08

Report By:NFallahi

COLUMBIA ANALYTICAL SERVICES, INC.

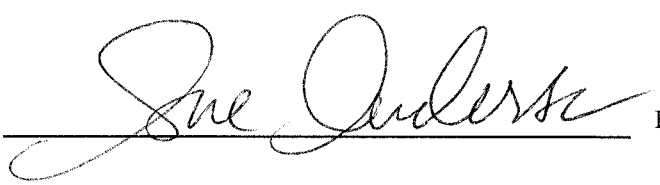
QA/QC Report

Client :	Battelle	**Service Request :**	P0802406
Project Name :	JPL Groundwater Monitoring 3Q08	**Date Collected :**	07/30/08
Project Number :	G486090	**Date Received :**	07/30/08
Sample Matrix :	WATER	**Date Extracted :**	07/30/08
		Date Analyzed :	07/30/08

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name :	MW-11-2		Units :	mg/L (ppm)
Lab Code :	P0802406-002MS	P0802406-002DMS	Basis :	NA
Test Notes :				

Analyte	Prep Method	Analysis Method	PQL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Spike Recovery MS	Spike Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.050	0.050	ND	0.0470	0.0483	94	97	82-114	3	

Approved By  Date : 8/8/08

Report By:NFallahi

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P0802406
Project Name :	JPL Groundwater Monitoring 3Q08	**Date Collected :**	7/30/2008
Project Number :	G486090	**Date Received :**	7/30/2008
Sample Matrix :	WATER	**Date Extracted :**	07/30/08
		Date Analyzed :	07/30/08

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-22-1 Units : mg/L (ppm)
Lab Code : P0802406-006MS P0802406-006DMS Basis : NA
Test Notes :

Analyte	Prep Method	Analysis Method	PQL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Spike Recovery MS	Spike Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.050	0.050	ND	0.0489	0.0476	98	95	82-114	3	

Approved By _____ Date : 8/8/08

Report By:NFallahi

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

Columbia Analytical Services INC.
An Employee - Owned Company

CAS SR #P0802421

Table of Contents

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

Columbia Analytical Services INC.
An Employee - Owned Company

LABORATORY REPORT

August 8, 2008

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

RE: JPL Groundwater Monitoring 3Q08 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on July 31, 2008. For your reference, these analyses have been assigned our service request number P0802421.

All analyses were performed in accordance with our laboratory's quality assurance program. 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. 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.

Sue Anderson
Project Manager

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

Columbia Analytical Services INC.
An Employee - Owned Company

Client: Battelle CAS Project No: P0802421
Project: JPL Groundwater Monitoring 3Q08 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on July 31, 2008 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 3Q08/G486090

Service Request: P0802421

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P0802421-001	MW-12-3	07/31/08	08:08
P0802421-002	MW-12-2	07/31/08	08:33
P0802421-003	MW-12-1	07/31/08	09:23
P0802421-004	DUPE-7-3Q08	07/31/08	00:00
P0802421-005	EB-09-7/31/08	07/31/08	09:12

Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl *tert*-Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
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 INC.
An Employee - Owned Company

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

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

CAS Project No. P0802421

CAS Contact:

Company Name & Address (Reporting Information)	Project Name
BATTELLE 3990 OLD TOWN AVE, C-205 SAN DIEGO, CA 92110	SPL GW MON 3Q08 Project Number G4486090
Project Manager: DAVID CONNER	P.O. # / Billing Information: 214319/BATTELLE ATTN: GERALD TOMPKINS 505 KING AVE COLUMBUS, OH 43201
Phone: 619-726-7311 / Fax:	
Email Address for Result Reporting	Sampler (Print & Sign): MARCO MENDOZA

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas ☐	TPH Gas 8015B ☐ BTEX 8021B ☐ MTBE 8021B ☐	TPH Diesel 8015B ☐ (Subcontracted)	TPH Diesel Low Level 8015B ☐ (Subcontracted)	TPH FC ☐ 8015M (Subcontracted)	Semi-Volatile Organics GC/MS 625 ☐ 8270C ☐ (Subcontracted)	0	Cr III (7196)	Remarks
MW-12-3	~~808~~ 1	7/31/08	808	W	1							X		
MW-12-2	~~833~~ 2		833									X		
MW-12-1			923									X		
DUPE-7-3Q08	—		—									X		DUPLICATE
EB-09-7/31/08			912									X		EQUIP BLANK

Preservative Key

0	None
1	HCL
2	HNO3
3	H2SO4
4	NaOH
5	Zn Acetate
6	Asc Acid
7	Other

Report Tier Levels - please select

Tier I - (Results/Default if not specified) ____
Tier II - (Results + QC) ____
Tier III - (Data Validation Package) 10% Surcharge ____
Tier V - (client specified) X

MRL required Yes / No
MDL / PQL / J required Yes / No

EDD required Yes / No
Type: Geotracker

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	7/31/08	1130		7/31/08	11:30
	7/31/08	17:50		7/31/08	1150
	Date:	Time:		Date:	Time:

Cooler / Blank Ice / No Ice
Temperature 3 °C

Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL Groundwater Monitoring 3Q08/G486090

Service Request: P0802421

Bottle ID	Date	Time	Sample Location / User	Disposed On
P0802421-001.01	07/31/2008	1157	SMO / LKUKITA	
	07/31/2008	1317	In Lab / NFALLAHI	
	07/31/2008	1656	P0802421-002.01 / DCASTILLO	
P0802421-002.01	07/31/2008	1157	SMO / LKUKITA	
	07/31/2008	1317	In Lab / NFALLAHI	
P0802421-003.01	07/31/2008	1157	SMO / LKUKITA	
	07/31/2008	1317	In Lab / NFALLAHI	
	07/31/2008	1656	P0802421-002.01 / DCASTILLO	
P0802421-004.01	07/31/2008	1157	SMO / LKUKITA	
	07/31/2008	1317	In Lab / NFALLAHI	
	07/31/2008	1656	P0802421-002.01 / DCASTILLO	
P0802421-005.01	07/31/2008	1157	SMO / LKUKITA	
	07/31/2008	1318	In Lab / NFALLAHI	
	07/31/2008	1656	P0802421-002.01 / DCASTILLO	

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0802421

Project: JPL Groundwater Monitoring 3Q08 / G486090

Sample(s) received on: 7/31/08 Date opened: 7/31/08 by: LKUKITA

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
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Container(s) **supplied by CAS**?	☒	☐	☐
3	Did **sample containers** arrive in good condition?	☒	☐	☐
4	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
5	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
6	Was **sample volume** received adequate for analysis?	☒	☐	☐
7	Are samples within specified holding times?	☒	☐	☐
8	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature _____ °C Blank Temperature 3 °C			
9	Was a **trip blank** received?	☐	☐	☒
	Trip blank supplied by CAS: Serial # _____ -TB _____			
10	Were **custody seals** on outside of cooler/Box?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
	Were custody seals on outside of sample container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
11	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
12	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
	Do they contain moisture?	☐	☐	☒
13	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0802421-001.01	125mL Plastic NP					
P0802421-002.01	125mL Plastic NP					
P0802421-003.01	125mL Plastic NP					
P0802421-004.01	125mL Plastic NP					
P0802421-005.01	125mL Plastic NP					

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

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

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL Groundwater Monitoring 3Q08
Project Number : G486090
Sample Matrix : WATER

Service Request : P0802421
Date Collected : 07/31/08
Date Received : 07/31/08

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-12-3	P0802421-001	0.010	0.006	1	7/31/2008	07/31/08 15:30	ND	
MW-12-2	P0802421-002	0.010	0.006	1	7/31/2008	07/31/08 15:30	ND	
MW-12-1	P0802421-003	0.010	0.006	1	7/31/2008	07/31/08 15:30	ND	
DUPE-7-3Q08	P0802421-004	0.010	0.006	1	7/31/2008	07/31/08 15:30	ND	
EB-09-7/31/08	P0802421-005	0.010	0.006	1	7/31/2008	07/31/08 15:30	ND	
Method Blank	P0802421-MB	0.010	0.006	1	7/31/2008	07/31/08 15:30	ND	

Approved By Sue Anderson Date : 8/8/08

Report By:NFallahi

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P0802421
Project:	JPL Groundwater Monitoring 3Q08 / G486090	**Date Analyzed:**	7/31/08

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: _____ Date: 8/8/08

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P0802421
Project:	JPL Groundwater Monitoring 3Q08 / G486090	**Date Analyzed:**	7/31/08

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	0.0404	97
CCV1	0.0418	0.0379	91

Approved By: _____ Date: 8/8/08

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P0802421
Project Name :	JPL Groundwater Monitoring 3Q08	**Date Collected :**	NA
Project Number :	G486090	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	07/31/08
		Date Analyzed :	07/31/08

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P0802421-LCS	Basis :	NA
Test Notes :			

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.040	0.0388	97	92-113	

Approved By _____ Date : 8/8/08

Report By:NFallahi

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P0802421
Project Name :	JPL Groundwater Monitoring 3Q08	**Date Collected :**	07/31/08
Project Number :	G486090	**Date Received :**	07/31/08
Sample Matrix :	WATER	**Date Extracted :**	07/31/08
		Date Analyzed :	07/31/08

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-12-3 Units : mg/L (ppm)
Lab Code : P0802421-001MS P0802421-001DMS Basis : NA
Test Notes :

Analyte	Prep Method	Analysis Method	PQL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Spike Recovery MS	Spike Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.050	0.050	ND	0.0539	0.0554	108	111	82-114	3	

Approved By _____ Date : 8/8/08

Report By:NFallahi

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

Columbia Analytical Services INC.
An Employee - Owned Company

CAS SR #P0802448

Table of Contents

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

Columbia Analytical Services INC.
An Employee - Owned Company

LABORATORY REPORT

August 12, 2008

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

RE: JPL Groundwater Monitoring 3Q08 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on August 1, 2008. For your reference, these analyses have been assigned our service request number P0802448.

All analyses were performed in accordance with our laboratory's quality assurance program. 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. 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.

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: P0802448
Project: JPL Groundwater Monitoring 3Q08 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on August 1, 2008 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 3Q08/G486090

Service Request: P0802448

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P0802448-001	MW-25-5	08/01/08	07:51
P0802448-002	MW-25-4	08/01/08	08:24
P0802448-003	MW-25-3	08/01/08	08:54
P0802448-004	MW-25-2	08/01/08	09:47
P0802448-005	MW-25-1	08/01/08	10:18
P0802448-006	EB-10-8/1/08	08/01/08	10:02

Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl *tert*-Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
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 INC.
An Employee - Owned Company

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

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

CAS Project No. P080244 8

CAS Contact:

Company Name & Address (Reporting Information)
BATTELLE
3990 OLD TOWN AVE, C-205
SANDIEGO, CA 92110

Project Name: JPL GW MON 3Q08

Project Number: G486090

Project Manager: DAVID CONNER

P.O. # / Billing Information
214319
ATTN: GERALD TOMPKINS
505 KING AVE.
COLUMBUS, OH 43201

Phone: 619-726-7311

Fax:

Email Address for Result Reporting:

Sampler (Print & Sign):

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas ☐	TPH Gas 8015B ☐ BTEX 8021B ☐ MTBE 8021B ☐	TPH Diesel 8015B ☐ (Subcontracted)	TPH Diesel Low Level 8015B ☐ (Subcontracted)	TPH FC ☐ 8015M (Subcontracted)	Semi-Volatile Organics GC/MS 625 ☐ 8270C ☐ (Subcontracted)	0 / Cr VI (7196)	Remarks
MW-25-5	1	8/1/08	751	W	1							X	
MW-25-4	2		824		1							X	
MW-25-3	3		854		2							X	MS/MSD
MW-25-2	4		947		1							X	
MW-25-1	5		~~1018~~ 1002		1							X	
EB-10-8/1/08	6		1002		1							X	EQUIP. BLANK

Preservative Key

0	None
1	HCL
2	HNO3
3	H2SO4
4	NaOH
5	Zn Acetate
6	Asc Acid
7	Other

Report Tier Levels - please select

Tier I - (Results/Default if not specified) ____
Tier II - (Results + QC) ____
Tier III - (Data Validation Package) 10% Surcharge ____
Tier V - (client specified) X

MRL required Yes / No
MDL / PQL / J required Yes / No
EDD required Yes / No
Type: ____

Project Requirements (MRLs, QAPP)

	Date	Time		Date	Time
Relinquished by: (Signature)	8/1/08	1705	Received by: (Signature)	8/1/08	1705
Relinquished by: (Signature)	8/1/08	1745	Received by: (Signature)	8/1/08	1745
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Cooler / Blank / Ice / No Ice

Temperature 3 °C

Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL Groundwater Monitoring 3Q08/G486090

Service Request: P0802448

Bottle ID	Date	Time	Sample Location / User	Disposed On
P0802448-001.01	08/01/2008	1155	SMO / LKUKITA	
	08/01/2008	1215	In Lab / NFALLAHI	
	08/01/2008	1550	P0802448-003.02 / NFALLAHI	
P0802448-002.01	08/01/2008	1155	SMO / LKUKITA	
	08/01/2008	1214	In Lab / NFALLAHI	
	08/01/2008	1550	P0802448-003.02 / NFALLAHI	
P0802448-003.01	08/01/2008	1155	SMO / LKUKITA	
	08/01/2008	1215	In Lab / NFALLAHI	
	08/01/2008	1550	P0802448-003.02 / NFALLAHI	
P0802448-003.02	08/01/2008	1155	SMO / LKUKITA	
	08/01/2008	1214	In Lab / NFALLAHI	
P0802448-004.01	08/01/2008	1155	SMO / LKUKITA	
	08/01/2008	1214	In Lab / NFALLAHI	
	08/01/2008	1550	P0802448-003.02 / NFALLAHI	
P0802448-005.01	08/01/2008	1155	SMO / LKUKITA	
	08/01/2008	1214	In Lab / NFALLAHI	
	08/01/2008	1550	P0802448-003.02 / NFALLAHI	
P0802448-006.01	08/01/2008	1155	SMO / LKUKITA	
	08/01/2008	1214	In Lab / NFALLAHI	
	08/01/2008	1550	P0802448-003.02 / NFALLAHI	

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0802448

Project: JPL Groundwater Monitoring 3Q08 / G486090

Sample(s) received on: 8/1/08 Date opened: 8/1/08 by: LKUKITA

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
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Container(s) **supplied by CAS**?	☒	☐	☐
3	Did **sample containers** arrive in good condition?	☒	☐	☐
4	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
5	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
6	Was **sample volume** received adequate for analysis?	☒	☐	☐
7	Are samples within specified holding times?	☒	☐	☐
8	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature _____ °C Blank Temperature 3 °C			
9	Was a **trip blank** received?	☐	☐	☒
	Trip blank supplied by CAS: Serial # _____ -TB _____			
10	Were **custody seals** on outside of cooler/Box?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
	Were custody seals on outside of sample container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
11	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
12	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
	Do they contain moisture?	☐	☐	☒
13	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0802448-001.01	125mL Plastic NP					
P0802448-002.01	125mL Plastic NP					
P0802448-003.01	125mL Plastic NP					
P0802448-003.02	125mL Plastic NP					
P0802448-004.01	125mL Plastic NP					
P0802448-005.01	125mL Plastic NP					
P0802448-006.01	125mL Plastic NP					

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

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

Diss. Sulfide, NaOH (pH>12); T. Sulfide, NaOH/ZnAc (pH>12) RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL Groundwater Monitoring 3Q08
Project Number : G486090
Sample Matrix : WATER

Service Request : P0802448
Date Collected : 08/01/08
Date Received : 08/01/08

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-25-5	P0802448-001	0.010	0.006	1	NA	08/01/08 14:50	ND	
MW-25-4	P0802448-002	0.010	0.006	1	NA	08/01/08 14:50	ND	
MW-25-3	P0802448-003	0.010	0.006	1	NA	08/01/08 14:50	ND	
MW-25-2	P0802448-004	0.010	0.006	1	NA	08/01/08 14:50	ND	
MW-25-1	P0802448-005	0.010	0.006	1	NA	08/01/08 14:50	ND	
EB-10-8/1/08	P0802448-006	0.010	0.006	1	NA	08/01/08 14:50	ND	
Method Blank	P0802448-MB	0.010	0.006	1	NA	08/01/08 14:50	ND	

Approved By _____ Date : 8/11/08

Report By:NFallahi

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P0802448
Project:	JPL Groundwater Monitoring 3Q08 / G486090	**Date Analyzed:**	8/1/08

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: Sue Anderson Date: 8/11/08

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P0802448
Project:	JPL Groundwater Monitoring 3Q08 / G486090	**Date Analyzed:**	8/1/08

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	0.0395	94
CCV1	0.0418	0.0416	100

Approved By: _____ Date: 8/11/08

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P0802448
Project Name :	JPL Groundwater Monitoring 3Q08	**Date Collected :**	NA
Project Number :	G486090	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	08/01/08

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P0802448-LCS	Basis :	NA
Test Notes :			

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.040	0.0405	101	92-113	

Approved By _____ Date : 8/11/08

Report By:NFallahi

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client : Battelle
Project Name : JPL Groundwater Monitoring 3Q08
Project Number : G486090
Sample Matrix : WATER

Service Request : P0802448
Date Collected : 08/01/08
Date Received : 08/01/08
Date Extracted : NA
Date Analyzed : 08/01/08

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-25-3
Lab Code : P0802448-003MS P0802448-003DMS
Test Notes :

Units : mg/L (ppm)
Basis : NA

Analyte	Prep Method	Analysis Method	PQL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Spike Recovery MS	Spike Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.050	0.050	ND	0.0513	0.0546	103	109	82-114	6	

Approved By _____ Date : 8/11/08

Report By:NFallahi

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

Columbia Analytical Services INC.
An Employee - Owned Company

CAS SR #P0802472

Table of Contents

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

Columbia Analytical Services INC.
An Employee - Owned Company

LABORATORY REPORT

August 14, 2008

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

RE: JPL Groundwater Monitoring 3Q08 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on August 4, 2008. For your reference, these analyses have been assigned our service request number P0802472.

All analyses were performed in accordance with our laboratory's quality assurance program. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains 27 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. 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.

Sue Anderson
Project Manager

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

Columbia Analytical Services INC.
An Employee - Owned Company

Client: Battelle CAS Project No: P0802472
Project: JPL Groundwater Monitoring 3Q08 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on August 4, 2008 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 3Q08/G486090

Service Request: P0802472

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P0802472-001	MW-24-4	08/04/08	08:11
P0802472-002	MW-24-3	08/04/08	08:41
P0802472-003	MW-24-2	08/04/08	09:10
P0802472-004	MW-24-1	08/04/08	09:52
P0802472-005	EB-11-08/04/08	08/04/08	09:30
P0802472-006	MW-26-2	08/04/08	11:30
P0802472-007	MW-26-1	08/04/08	12:05

Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl *tert*-Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
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

Page 1 of 1

Columbia Analytical Services INC.
An Employee - Owned Company

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

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

CAS Project No. P0502472

CAS Contact:

Company Name & Address (Reporting Information)	Project Name
BATTELLE 3990 OLD TOWN AVE, C-205 SAN DIEGO, CA 92110	JPL GW MON. 3Q08
	Project Number 64861090
Project Manager DAVID CONNER	P.O. # / Billing Information #214319 ATTN: GERALD TOMPKINS 505 KING AVE. COLUMBUS, OH 43201
Phone 619-726-7311	Fax
Email Address for Result Reporting	Sampler (Print & Sign)

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas ☐	TPH Gas 8015B ☐ BTEX 8021B ☐ MTBE 8021B ☐	TPH Diesel 8015B ☐ (Subcontracted) TPH Diesel Low Level 8015B ☐ (Subcontracted)	TPH FC ☐ 8015M (Subcontracted)	Semi-Volatile Organics GC/MS 625 ☐ 8270C ☐ (Subcontracted)	0 Cr III (7199)	Remarks
MW-24-4	1	8/4/08	0811	W	1						X	
MW-24-3	2		0841								X	
MW-24-2	3		0910								X	
MW-24-1	4		0952		2						X	MS/MSD
EB-1#-08/04/08	5		0930		1						X	EQUIPMENT BLANK

Preservative Key

0	None
1	HCL
2	HNO3
3	H2SO4
4	NaOH
5	Zn Acetate
6	Asc Acid
7	Other

Report Tier Levels - please select

Tier I - (Results/Default if not specified) ____
Tier II - (Results + QC) ____
Tier III - (Data Validation Package) 10% Surcharge ____
Tier V - (client specified) X

MRL required Yes / No
MDL / PQL / J required Yes / No

EDD required Yes / No
Type: Geotracker

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date: 08/04/08	Time: 1300	Received by: (Signature)		Date: 8/4/08	Time: 1300	
Relinquished by: (Signature)	Date: 8/4/08	Time: 13:50	Received by: (Signature)	Ultrawave	Date: 8/4/08	Time: 1350	Cooler / Blank / Ice / No Ice
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)		Date:	Time:	Temperature 20c °C

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

Page 1 of 1

Columbia Analytical Services INC.
An Employee - Owned Company

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

P0802472

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

CAS Project No. P080~~2~~473

CAS Contact:

Company Name & Address (Reporting Information)	Project Name
BATTELLE 3990 OLD TOWN AVE, C-205 SAN DIEGO, CA 92110	SPL GW MON. 3Q08
	Project Number G486090
Project Manager DAVID CONNER	P.O. # / Billing Information # 214319 ATTN: GERALD TOMPKINS 505 KING AVE. COLUMBUS, OH 43201
Phone ~~614~~ 619-726-7311	Fax
Email Address for Result Reporting	Sampler (Print & Sign)

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas ☐	TPH Gas 8015B ☐ BTEX 8021B ☐ MTBE 8021B ☐	TPH Diesel 8015B ☐ (Subcontracted)	TPH Diesel Low Level 8015B ☐ (Subcontracted)	TPH FC ☐ 8015M (Subcontracted)	Semi-Volatile Organics GC/MS 625 ☐ 8270C ☐ (Subcontracted)	0	Cr VI (7196)	Remarks
MW-26-2	(6)	8/4/08	1130	W	1							X		
MW-26-1	(7)		1205		1							X		

Preservative Key

0	None
1	HCL
2	HNO3
3	H2SO4
4	NaOH
5	Zn Acetate
6	Asc Acid
7	Other

Report Tier Levels - please select

Tier I - (Results/Default if not specified) ____
Tier II - (Results + QC) ____
Tier III - (Data Validation Package) 10% Surcharge ____
Tier V - (client specified) X

MRL required Yes / No
MDL / PQL / J required Yes / No

EDD required Yes / No
Type: Geotracker

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	08/04/08	1300			
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	8/4/08	1350		8/4/08	1350
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Cooler / Blank / Ice / No Ice
Temperature 2°C °C

Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL Groundwater Monitoring 3Q08/G486090

Service Request: P0802472

Bottle ID	Date	Time	Sample Location / User	Disposed On
P0802472-001.01	08/04/2008	1402	SMO / MZAMORA	
	08/04/2008	1404	P-39 / MZAMORA	
	08/04/2008	1435	In Lab / NFALLAHI	
	08/04/2008	1658	P0802472-004.02 / NFALLAHI	
P0802472-002.01	08/04/2008	1402	SMO / MZAMORA	
	08/04/2008	1404	P-39 / MZAMORA	
	08/04/2008	1435	In Lab / NFALLAHI	
	08/04/2008	1658	P0802472-004.02 / NFALLAHI	
P0802472-003.01	08/04/2008	1402	SMO / MZAMORA	
	08/04/2008	1404	P-39 / MZAMORA	
	08/04/2008	1435	In Lab / NFALLAHI	
	08/04/2008	1658	P0802472-004.02 / NFALLAHI	
P0802472-004.01	08/04/2008	1402	SMO / MZAMORA	
	08/04/2008	1404	P-39 / MZAMORA	
	08/04/2008	1435	In Lab / NFALLAHI	
	08/04/2008	1658	P0802472-004.02 / NFALLAHI	
P0802472-004.02	08/04/2008	1402	SMO / MZAMORA	
	08/04/2008	1404	P-39 / MZAMORA	
	08/04/2008	1435	In Lab / NFALLAHI	
	08/14/2008	1122	P-37 / LKUKITA	
P0802472-005.01	08/04/2008	1402	SMO / MZAMORA	
	08/04/2008	1404	P-39 / MZAMORA	
	08/04/2008	1436	In Lab / NFALLAHI	
	08/04/2008	1658	P0802472-004.02 / NFALLAHI	
P0802472-006.01	08/04/2008	1422	SMO / MZAMORA	
	08/04/2008	1434	In Lab / NFALLAHI	
	08/04/2008	1658	P0802472-004.02 / NFALLAHI	
P0802472-007.01	08/04/2008	1422	SMO / MZAMORA	
	08/04/2008	1435	In Lab / NFALLAHI	
	08/04/2008	1658	P0802472-004.02 / NFALLAHI	

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0802472

Project: JPL Groundwater Monitoring 3Q08 / G486090

Sample(s) received on: 8/4/08 Date opened: 8/4/08 by: MZAMORA

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
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Container(s) **supplied by CAS**?	☒	☐	☐
3	Did **sample containers** arrive in good condition?	☒	☐	☐
4	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
5	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
6	Was **sample volume** received adequate for analysis?	☒	☐	☐
7	Are samples within specified holding times?	☒	☐	☐
8	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature _____ °C Blank Temperature 2 °C			
9	Was a **trip blank** received?	☐	☐	☒
	Trip blank supplied by CAS: Serial # _____ -TB _____			
10	Were **custody seals** on outside of cooler/Box?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
	Were custody seals on outside of sample container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
11	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
12	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
	Do they contain moisture?	☐	☐	☒
13	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0802472-001.01	125mL Plastic NP					
P0802472-002.01	125mL Plastic NP					
P0802472-003.01	125mL Plastic NP					
P0802472-004.01	125mL Plastic NP					
P0802472-004.02	125mL Plastic NP					
P0802472-005.01	125mL Plastic NP					
P0802472-006.01	125mL Plastic NP					

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

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

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0802472

Project: JPL Groundwater Monitoring 3Q08 / G486090

Sample(s) received on: 8/4/08 Date opened: 8/4/08 by: MZAMORA

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0802472-007.01	125mL Plastic NP					

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

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

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL Groundwater Monitoring 3Q08
Project Number : G486090
Sample Matrix : WATER

Service Request : P0802472
Date Collected : 08/04/08
Date Received : 08/04/08

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-24-4	P0802472-001	0.010	0.006	1	NA	08/04/08 14:40	ND	
MW-24-3	P0802472-002	0.010	0.006	1	NA	08/04/08 14:40	ND	
MW-24-2	P0802472-003	0.010	0.006	1	NA	08/04/08 14:40	ND	
MW-24-1	P0802472-004	0.010	0.006	1	NA	08/04/08 14:40	ND	
EB-11-08/04/08	P0802472-005	0.010	0.006	1	NA	08/04/08 14:40	ND	
MW-26-2	P0802472-006	0.010	0.006	1	NA	08/04/08 14:40	ND	
MW-26-1	P0802472-007	0.010	0.006	1	NA	08/04/08 14:40	ND	
Method Blank	P0802472-MB	0.010	0.006	1	NA	08/04/08 14:40	ND	

Approved By Sue Anderson Date : 8/14/08

Report By:NFallahi

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P0802472
Project:	JPL Groundwater Monitoring 3Q08 / G486090	**Date Analyzed:**	8/4/08

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

Approved By: Jane Anderson Date: 8/14/08

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P0802472
Project:	JPL Groundwater Monitoring 3Q08 / G486090	**Date Analyzed:**	8/4/08

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	0.0404	97
CCV1	0.0418	0.0404	97
CCV2	0.0418	0.0404	97

Approved By: Sue Anderson Date: 8/14/08

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P0802472
Project Name :	JPL Groundwater Monitoring 3Q08	**Date Collected :**	NA
Project Number :	G486090	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	08/04/08

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P0802472-LCS	Basis :	NA
Test Notes :			

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.040	0.0412	103	92-113	

Approved By Sue Anderson Date : 8/14/08

Report By:NFallahi

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P0802472
Project Name :	JPL Groundwater Monitoring 3Q08	**Date Collected :**	08/04/08
Project Number :	G486090	**Date Received :**	08/04/08
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	08/04/08

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-24-1 Units : mg/L (ppm)
Lab Code : P0802472-004MS P0802472-004DMS Basis : NA
Test Notes :

Analyte	Prep Method	Analysis Method	PQL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Spike Recovery MS	Spike Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.050	0.050	ND	0.0512	0.0512	102	102	82-114	<1	

Approved By _____ Date : 8/14/08

Report By:NFallahi

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

Columbia Analytical Services INC.
An Employee - Owned Company

CAS SR #P0802511

Table of Contents

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

Columbia Analytical Services INC.
An Employee - Owned Company

LABORATORY REPORT

August 14, 2008

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

RE: JPL Groundwater Monitoring 3Q08 / G486090

Dear David:

Enclosed are the results of the sample submitted to our laboratory on August 5, 2008. For your reference, these analyses have been assigned our service request number P0802511.

All analyses were performed in accordance with our laboratory's quality assurance program. 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. 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.

Sue Anderson
Project Manager

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

Columbia Analytical Services INC.
An Employee - Owned Company

Client: Battelle CAS Project No: P0802511
Project: JPL Groundwater Monitoring 3Q08 / G486090

CASE NARRATIVE

The sample was received intact under chain of custody on August 5, 2008 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 3Q08/G486090

Service Request: P0802511

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P0802511-001	MW-7	08/05/08	09:55

3

Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl *tert*-Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
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

Page 1 of 1

Columbia Analytical Services INC.
An Employee - Owned Company

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

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

CAS Project No. P0802511

CAS Contact:

Company Name & Address (Reporting Information)	Project Name
BATTELLE 3990 OLD TOWN AVE, C-205 SAN DIEGO, CA 92110	JPL GW MON 3Q08
	Project Number G4486090
Project Manager DAVID CONNER	P.O. # / Billing Information 21439/BATTELLE ATTEN: GERALD TOMPKINS 505 KING AVE COLUMBUS, OH 43201
Phone 619-726-7311	Fax
Email Address for Result Reporting	Sampler (Print & Sign)

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas ☐	TPH Gas 8015B ☐ BTEX 8021B ☐ MTBE 8021B ☐	TPH Diesel 8015B ☐ (Subcontracted)	TPH Diesel Low Level 8015B ☐ (Subcontracted)	TPH FC ☐ 8015M (Subcontracted)	Semi-Volatile Organics GC/MS 625 ☐ 8270C ☐ (Subcontracted)	0	Cr VI (7196)	Remarks
MW-7	(1)	8/5/08	0955	W	1							X		
MW-16 (CB)					1							X		(CB)

Preservative Key

0	None
1	HCL
2	HNO3
3	H2SO4
4	NaOH
5	Zn Acetate
6	Asc Acid
7	Other

Report Tier Levels - please select

Tier I - (Results/Default if not specified) ____
Tier II - (Results + QC) ____
Tier III - (Data Validation Package) 10% Surcharge ____
Tier V - (client specified) X

MRL required Yes / No
MDL / PQL required Yes / No

EDD required Yes / No
Type: Excel

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	8/5/08	1400		8/5/08	1700
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
CT	8/5/08	1715		8/5/08	1715
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Cooler / Blank / Ice / No Ice
Temperature 3 °C

Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL Groundwater Monitoring 3Q08/G486090

Service Request: P0802511

Bottle ID	Date	Time	Sample Location / User	Disposed On
P0802511-001.01	08/05/2008	1720	SMO / LKUKITA	
	08/05/2008	1723	In Lab / NFALLAHI	
	08/05/2008	1824	P-37 / NFALLAHI	
	08/06/2008	0913	In Lab / NFALLAHI	
	08/06/2008	1042	P-37 / NFALLAHI	

6

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0802511

Project: JPL Groundwater Monitoring 3Q08 / G486090

Sample(s) received on: 8/5/08 Date opened: 8/5/08 by: LKUKITA

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
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Container(s) **supplied by CAS**?	☒	☐	☐
3	Did **sample containers** arrive in good condition?	☒	☐	☐
4	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
5	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
6	Was **sample volume** received adequate for analysis?	☒	☐	☐
7	Are samples within specified holding times?	☒	☐	☐
8	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature _____ °C Blank Temperature 3 °C			
9	Was a **trip blank** received?	☐	☐	☒
	Trip blank supplied by CAS: Serial # _____ -TB _____			
10	Were **custody seals** on outside of cooler/Box?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
	Were custody seals on outside of sample container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
11	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
12	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
	Do they contain moisture?	☐	☐	☒
13	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0802511-001.01	125mL Plastic NP					

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

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

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL Groundwater Monitoring 3Q08
Project Number : G486090
Sample Matrix : WATER

Service Request : P0802511
Date Collected : 08/05/08
Date Received : 08/05/08

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	P0802511-001	0.010	0.006	1	NA	08/06/08 09:45	ND	
Method Blank	P0802511-MB	0.010	0.006	1	NA	08/06/08 09:45	ND	

Approved By _____ Date : 8/14/08

Report By:NFallahi

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P0802511
Project:	JPL Groundwater Monitoring 3Q08 / G486090	**Date Analyzed:**	8/6/08

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: _____ Date: 8/14/08

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P0802511
Project:	JPL Groundwater Monitoring 3Q08 / G486090	**Date Analyzed:**	8/6/08

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	0.0407	97
CCV1	0.0418	0.0393	98

Approved By: _____ Date: 8/14/08

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P0802511
Project Name :	JPL Groundwater Monitoring 3Q08	**Date Collected :**	NA
Project Number :	G486090	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	08/06/08

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P0802511-LCS	Basis :	NA
Test Notes :			

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.040	0.0420	105	92-113	

Approved By Joe Anderson Date : 8/14/08

Report By:NFallahi

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P0802511
Project Name :	JPL Groundwater Monitoring 3Q08	**Date Collected :**	08/05/08
Project Number :	G486090	**Date Received :**	08/05/08
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	08/06/08

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name :	MW-7		Units :	mg/L (ppm)
Lab Code :	P0802511-001MS	P0802511-001DMS	Basis :	NA
Test Notes :				

Analyte	Prep Method	Analysis Method	PQL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Spike Recovery MS	Spike Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.050	0.050	ND	0.0528	0.0528	106	106	82-114	<1	

Approved By _____ Date : 8/14/08

Report By:NFallahi

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

Columbia Analytical Services INC.
An Employee - Owned Company

CAS SR #P0802585

Table of Contents

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

Columbia Analytical Services INC.
An Employee - Owned Company

LABORATORY REPORT

August 18, 2008

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

RE: JPL Groundwater Monitoring 3Q08 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on August 8, 2008. For your reference, these analyses have been assigned our service request number P0802585.

All analyses were performed in accordance with our laboratory's quality assurance program. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains 23 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.

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

Columbia Analytical Services INC.
An Employee - Owned Company

Client: Battelle CAS Project No: P0802585
Project: JPL Groundwater Monitoring 3Q08 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on August 8, 2008 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 3Q08/G486090

Service Request: P0802585

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P0802585-001	MW-5	08/08/08	08:10
P0802585-002	MW-6	08/08/08	11:40
P0802585-003	MW-15	08/08/08	13:00

Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl *tert*-Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
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 INC.
An Employee - Owned Company

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

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

CAS Project No.: P0502555

CAS Contact:

Company Name & Address (Reporting Information): BATTELLE, 3990 OLD TOWN AVE, C-205, SAN DIEGO, CA 92110	Project Name: JPL GW MON. 3Q08
	Project Number: G486090
Project Manager: DAVID CONNER	P.O. # / Billing Information: 214319/BATTELLE ATTN: GERALD TOMPKINS 505 KING AVE. COLUMBUS, OH 43201
Phone: 619-726-7311 / Fax:	
Email Address for Result Reporting	Sampler (Print & Sign)

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas ☐	TPH Gas 8015B ☐ BTEX 8021B ☐ MTBE 8021B ☐	TPH Diesel 8015B ☐ (Subcontracted)	TPH Diesel Low Level 8015B ☐ (Subcontracted)	TPH FC ☐ 8015M (Subcontracted)	Semi-Volatile Organics GC/MS 625 ☐ 8270C ☐ (Subcontracted)	0	Cr VI (7198)	Remarks
MW-5	1	08/08/08	0810	W	1							X		
MW-6	2		1140		1							X		
MW-15	3		1300		1							X		

Preservative Key

0	None
1	HCL
2	HNO3
3	H2SO4
4	NaOH
5	Zn Acetate
6	Asc Acid
7	Other

Report Tier Levels - please select

Tier I - (Results/Default if not specified) ___
Tier II - (Results + QC) ___
Tier III - (Data Validation Package) 10% Surcharge ___
Tier V - (client specified) X

MRL required Yes / No
MDL / PQL / J required Yes / No

EDD required Yes / No
Type: GeoTracker

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)		Date: 8/8/08	Time: 1430	Received by: (Signature)		Date: 8/8/08	Time: 1430
Relinquished by: (Signature)		Date: 8/8/08	Time: 1435	Received by: (Signature)		Date: 8/8/08	Time: 1435
Relinquished by: (Signature)		Date: 8/8/08	Time: 1530	Received by: (Signature)		Date: 8/8/08	Time: 1530

Cooler / Blank / Ice / No Ice

Temperature 2 °C °C

Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL Groundwater Monitoring 3Q08/G486090

Service Request: P0802585

Bottle ID	Date	Time	Sample Location / User	Disposed On
P0802585-001.01	08/08/2008	1532	SMO / MZAMORA	
	08/08/2008	1532	P-37 / MZAMORA	
	08/08/2008	1543	In Lab / NFALLAHI	
	08/08/2008	1654	P-37 / NFALLAHI	
P0802585-002.01	08/08/2008	1532	SMO / MZAMORA	
	08/08/2008	1532	P-37 / MZAMORA	
	08/08/2008	1544	In Lab / NFALLAHI	
	08/08/2008	1654	P-37 / NFALLAHI	
P0802585-003.01	08/08/2008	1532	SMO / MZAMORA	
	08/08/2008	1532	P-37 / MZAMORA	
	08/08/2008	1543	In Lab / NFALLAHI	
	08/08/2008	1654	P-37 / NFALLAHI	

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0802585

Project: JPL Groundwater Monitoring 3Q08 / G486090

Sample(s) received on: 8/8/08 Date opened: 8/8/08 by: MZAMORA

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
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Container(s) **supplied by CAS**?	☒	☐	☐
3	Did **sample containers** arrive in good condition?	☒	☐	☐
4	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
5	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
6	Was **sample volume** received adequate for analysis?	☒	☐	☐
7	Are samples within specified holding times?	☒	☐	☐
8	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature 2 °C Blank Temperature _____ °C			
9	Was a **trip blank** received?	☐	☐	☒
	Trip blank supplied by CAS: Serial # _____ -TB _____			
10	Were **custody seals** on outside of cooler/Box?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
	Were custody seals on outside of sample container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
11	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☐	☐	☒
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
12	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
	Do they contain moisture?	☐	☐	☒
13	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0802585-001.01	125mL Plastic NP					
P0802585-002.01	125mL Plastic NP					
P0802585-003.01	125mL Plastic NP					

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

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

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL Groundwater Monitoring 3Q08
Project Number : G486090
Sample Matrix : WATER

Service Request : P0802585
Date Collected : 08/08/08
Date Received : 08/08/08

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-5	P0802585-001	0.010	0.006	1	NA	08/08/08 16:00	ND	
MW-6	P0802585-002	0.010	0.006	1	NA	08/08/08 16:00	ND	
MW-15	P0802585-003	0.010	0.006	1	NA	08/08/08 16:00	ND	
Method Blank	P0802585-MB	0.010	0.006	1	NA	08/08/08 16:00	ND	

Approved By  Date : 8/18/08

Report By:NFallahi

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P0802585
Project:	JPL Groundwater Monitoring 3Q08 / G486090	**Date Analyzed:**	8/8/08

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: _____ Date: 8/18/08

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Battelle
Project: JPL Groundwater Monitoring 3Q08 / G486090

Service Request: P0802585
Date Analyzed: 8/8/08

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	0.0392	94
CCV1	0.0418	0.0392	94

Approved By: _____ Date: 8/18/08

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P0802585
Project Name :	JPL Groundwater Monitoring 3Q08	**Date Collected :**	NA
Project Number :	G486090	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	08/08/08

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P0802585-LCS	Basis :	NA
Test Notes :			

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.040	0.0380	95	92-113	

Approved By _____ Date : 8/18/08

Report By:NFallahi

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P0802585
Project Name :	JPL Groundwater Monitoring 3Q08	**Date Collected :**	08/08/08
Project Number :	G486090	**Date Received :**	08/08/08
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	08/08/08

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name :	MW-5		Units :	mg/L (ppm)
Lab Code :	P0802585-001MS	P0802585-001DMS	Basis :	NA
Test Notes :				

Analyte	Prep Method	Analysis Method	PQL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Spike Recovery MS	Spike Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.050	0.050	ND	0.0492	0.0492	98	98	82-114	<1	

Approved By _____ Date : 8/18/08

Report By:NFallahi

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

Columbia Analytical Services INC.
An Employee - Owned Company

CAS SR #P0802599

Table of Contents

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

Columbia Analytical Services INC.
An Employee - Owned Company

LABORATORY REPORT

August 18, 2008

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

RE: JPL Groundwater Monitoring 3Q08 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on August 11, 2008. For your reference, these analyses have been assigned our service request number P0802599.

All analyses were performed in accordance with our laboratory's quality assurance program. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains 23 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.

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

Columbia Analytical Services INC.
An Employee - Owned Company

Client: Battelle CAS Project No: P0802599
Project: JPL Groundwater Monitoring 3Q08 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on August 11, 2008 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 3Q08/G486090

Service Request: P0802599

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P0802599-001	MW-13	08/11/08	09:05
P0802599-002	MW-8	08/11/08	11:09

Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl *tert*-Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
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

Page 1 of 1

Columbia Analytical Services INC.
An Employee - Owned Company

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

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

CAS Project No. P0802599

CAS Contact:

Company Name & Address (Reporting Information)	Project Name
BATTELLE 3990 OLD TOWN AVE. C-205 SAN DIEGO, CA 92110	JPL GW MON 3Q08
	Project Number: G486090
Project Manager: DAVID CONNER	P.O. # / Billing Information: 214319/BATTELLE ATTN: GERALD TOMPKINS 505 KING AVE. COLUMBUS, OH 43201
Phone: 619-726-7311 / Fax:	
Email Address for Result Reporting	Sampler (Print & Sign)

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas ☐	TPH Gas 8015B ☐ BTEX 8021B ☐ MTBE 8021B ☐	TPH Diesel 8015B ☐ (Subcontracted) TPH Diesel Low Level 8015B ☐ (Subcontracted)	TPH FC ☐ 8015M (Subcontracted)	Semi-Volatile Organics GC/MS 625 ☐ 8270C ☐ (Subcontracted)	0 Cr VI (7196)	Remarks
MW-13	1	8/11/08	0905	W	1						X	
MW-8	2	"	1109	"	1						X	

Preservative Key

0	None
1	HCL
2	HNO3
3	H2SO4
4	NaOH
5	Zn Acetate
6	Asc Acid
7	Other

Report Tier Levels - please select

Tier I - (Results/Default if not specified) ____
Tier II - (Results + QC) ____
Tier III - (Data Validation Package) 10% Surcharge ____
Tier V - (client specified) X

MRL required Yes / No
MDL / PQL / J required Yes / No

EDD required Yes / No
Type: Geotracker

Project Requirements (MRLs, QAPP)

	Date	Time		Date	Time
Relinquished by: (Signature)	8/11/08	1230	Received by: (Signature)	8/11/08	1225
Relinquished by: (Signature)	8/11/08	1233	Received by: (Signature)		
Relinquished by: (Signature)			Received by: (Signature)	8/11/08	1315

Cooler / Blank / Ice / No Ice
Temperature 3 °C

Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL Groundwater Monitoring 3Q08/G486090

Service Request: P0802599

Bottle ID	Date	Time	Sample Location / User	Disposed On
P0802599-001.01	08/11/2008	1329	SMO / LKUKITA	
	08/11/2008	1344	In Lab / NFALLAHI	
	08/11/2008	1638	P-37 / NFALLAHI	
P0802599-002.01	08/11/2008	1329	SMO / LKUKITA	
	08/11/2008	1345	In Lab / NFALLAHI	
	08/11/2008	1638	P-37 / NFALLAHI	

6

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0802599

Project: JPL Groundwater Monitoring 3Q08 / G486090

Sample(s) received on: 8/11/08 Date opened: 8/11/08 by: LKUKITA

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
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Container(s) **supplied by CAS**?	☒	☐	☐
3	Did **sample containers** arrive in good condition?	☒	☐	☐
4	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
5	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
6	Was **sample volume** received adequate for analysis?	☒	☐	☐
7	Are samples within specified holding times?	☒	☐	☐
8	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature _____ °C Blank Temperature 3 °C			
9	Was a **trip blank** received?	☐	☐	☒
	Trip blank supplied by CAS: Serial # _____ -TB _____			
10	Were **custody seals** on outside of cooler/Box?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
	Were custody seals on outside of sample container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
11	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
12	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
	Do they contain moisture?	☐	☐	☒
13	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0802599-001.01	125mL Plastic NP					
P0802599-002.01	125mL Plastic NP					

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

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

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL Groundwater Monitoring 3Q08
Project Number : G486090
Sample Matrix : WATER

Service Request : P0802599
Date Collected : 08/11/08
Date Received : 08/11/08

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	P0802599-001	0.010	0.006	1	NA	08/11/08 16:30	0.039	
MW-8	P0802599-002	0.010	0.006	1	NA	08/11/08 16:30	ND	
Method Blank	P0802599-MB	0.010	0.006	1	NA	08/11/08 16:30	ND	

Approved By Sue Anderson Date : 8/18/08

Report By:NFallahi

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P0802599
Project:	JPL Groundwater Monitoring 3Q08 / G486090	**Date Analyzed:**	8/11/08

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: _____ Date: 8/18/08

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P0802599
Project:	JPL Groundwater Monitoring 3Q08 / G486090	**Date Analyzed:**	8/11/08

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	0.0386	92
CCV1	0.0418	0.0386	92

Approved By: _____ Date: 8/18/08

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P0802599
Project Name :	JPL Groundwater Monitoring 3Q08	**Date Collected :**	NA
Project Number :	G486090	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	08/11/08

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P0802599-LCS	Basis :	NA
Test Notes :			

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.040	0.0408	102	92-113	

Approved By Sue Anderson Date : 8/18/08

Report By:NFallahi

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P0802599
Project Name :	JPL Groundwater Monitoring 3Q08	**Date Collected :**	08/11/08
Project Number :	G486090	**Date Received :**	08/11/08
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	08/11/08

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-13
Lab Code : P0802599-001MS P0802599-001DMS
Test Notes :

Units : mg/L (ppm)
Basis : NA

Analyte	Prep Method	Analysis Method	PQL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Spike Recovery MS	Spike Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.050	0.050	0.0386	0.0916	0.0873	106	97	82-114	5	

Approved By _____ Date : 8/18/08

Report By:NFallahi

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

Columbia Analytical Services INC.
An Employee - Owned Company

CAS SR #P0802625

Table of Contents

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

Columbia Analytical Services INC.
An Employee - Owned Company

LABORATORY REPORT

August 19, 2008

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

RE: JPL Groundwater Monitoring 3Q08 / G486090

Dear David:

Enclosed are the results of the samples submitted to our laboratory on August 12, 2008. For your reference, these analyses have been assigned our service request number P0802625.

All analyses were performed in accordance with our laboratory's quality assurance program. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein. Your report contains 23 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.

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

Columbia Analytical Services INC.
An Employee - Owned Company

Client: Battelle CAS Project No: P0802625
Project: JPL Groundwater Monitoring 3Q08 / G486090

CASE NARRATIVE

The samples were received intact under chain of custody on August 12, 2008 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 3Q08/G486090

Service Request: P0802625

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
P0802625-001	MW-16	08/12/08	10:04
P0802625-002	MW-10	08/12/08	13:05

Acronyms

CA LUFT	California DHS LUFT Method
ASTM	American Society for Testing and Materials
BTEX	Benzene/Toluene/Ethylbenzene/Xylenes
CAS Number	Chemical Abstract Service Registry Number
CFC	Chlorofluorocarbon
CRDL	Contract Required Detection Limit
DLCS	Duplicate Laboratory Control Sample
DMS	Duplicate Matrix Spike
DOH or DHS	Department of Health Services
EPA	U.S. Environmental Protection Agency
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
IC	Ion Chromatography
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
LCS	Laboratory Control Sample
LUFT	Leaking Underground Fuel Tank
M	Modified Method
MDL	Method Detection Limit
MRL	Method Reporting Limit
MS	Matrix Spike
MTBE	Methyl *tert*-Butyl Ether
NA	Not Applicable
NC	Not Calculated
ND	None Detected at or above the Method Reporting/Detection Limit (MRL/MDL)
NTU	Nephelometric Turbidity Units
ppb	Parts Per Billion
ppm	Parts Per Million
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RPD	Relative Percent Difference
SIM	Selected Ion Monitoring
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

Page 1 of 1

Columbia Analytical Services INC.
An Employee - Owned Company

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

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

CAS Project No. P0802625

CAS Contact:

Company Name & Address (Reporting Information)	Project Name
BATTELLE 3990 OLD TOWN AVE, C-205 SAN DIEGO, CA 92110	JPL GW MON. 3Q08
Project Manager	**Project Number**
DAVID CONNER	G486090
Phone / **Fax**	**P.O. # / Billing Information**
619-726-7311	214319/BATTELLE ATTN: GERALD TOMPKINS 505 KING AVE. COLUMBUS, OH 43201
Email Address for Result Reporting	**Sampler (Print & Sign)**

Analysis Method and/or Analytes

Preservative Code

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Matrix	Number of Containers	Volatile Organics GC/MS 624 ☐ 8260B ☐ Oxygenates ☐ TPH Gas ☐	TPH Gas 8015B ☐ BTEX 8021B ☐ MTBE 8021B ☐	TPH Diesel 8015B ☐ (Subcontracted) TPH Diesel Low Level 8015B ☐ (Subcontracted)	TPH FC ☐ 8015M (Subcontracted)	Semi-Volatile Organics GC/MS 625 ☐ 8270C ☐ (Subcontracted)	0 or DI (7196)	Remarks
MW-16	1	8/12/08	1004	W	1						X	
MW-10	2		1305		1						X	QC LEVEL IV

Preservative Key

0	None
1	HCL
2	HNO3
3	H2SO4
4	NaOH
5	Zn Acetate
6	Asc Acid
7	Other

Report Tier Levels - please select

Tier I - (Results/Default if not specified) ____
Tier II - (Results + QC) ____
Tier III - (Data Validation Package) 10% Surcharge ____
Tier V - (client specified) X

MRL required Yes / No
MDL / PQL / J required Yes / No
EDD required Yes / No
Type: Geotracker

Project Requirements (MRLs, QAPP)

	Date	Time		Date	Time
Relinquished by: (Signature)	8/12/08		Received by: (Signature)		
Relinquished by: (Signature)	8/12/08	1355	Received by: (Signature)	8/12/08	1355
Relinquished by: (Signature)			Received by: (Signature)		

Cooler / Blank / Ice / No Ice
Temperature 2 °C

Columbia Analytical Services, Inc.
Chain of Custody Report

Client: Battelle
Project: JPL Groundwater Monitoring 3Q08/G486090

Service Request: P0802625

Bottle ID	Date	Time	Sample Location / User	Disposed On
P0802625-001.01	08/12/2008	1356	SMO / LKUKITA	
	08/12/2008	1402	In Lab / NFALLAHI	
	08/12/2008	1544	P-37 / NFALLAHI	
P0802625-002.01	08/12/2008	1356	SMO / LKUKITA	
	08/12/2008	1402	In Lab / NFALLAHI	
	08/12/2008	1544	P-37 / NFALLAHI	

6

Columbia Analytical Services, Inc.
Sample Acceptance Check Form

Client: Battelle Work order: P0802625

Project: JPL Groundwater Monitoring 3Q08 / G486090

Sample(s) received on: 8/12/08 Date opened: 8/12/08 by: LKUKITA

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
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Container(s) **supplied by CAS**?	☒	☐	☐
3	Did **sample containers** arrive in good condition?	☒	☐	☐
4	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
5	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
6	Was **sample volume** received adequate for analysis?	☒	☐	☐
7	Are samples within specified holding times?	☒	☐	☐
8	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature _____ °C Blank Temperature 2 °C			
9	Was a **trip blank** received?	☐	☐	☒
	Trip blank supplied by CAS: Serial # _____ -TB _____			
10	Were **custody seals** on outside of cooler/Box?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
	Were custody seals on outside of sample container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
11	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☒	☐	☐
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
12	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
	Do they contain moisture?	☐	☐	☒
13	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P0802625-001.01	125mL Plastic NP					
P0802625-002.01	125mL Plastic NP					

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

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

DIVIDER SHEET

ANALYTICAL DATA FOR

Hexavalent Chromium

ANALYSIS

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Battelle
Project Name : JPL Groundwater Monitoring 3Q08
Project Number : G486090
Sample Matrix : WATER

Service Request : P0802625
Date Collected : 08/12/08
Date Received : 08/12/08

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-16	P0802625-001	0.010	0.006	1	NA	08/12/08 15:50	ND	
MW-10	P0802625-002	0.010	0.006	1	NA	08/12/08 15:50	ND	
Method Blank	P0802625-MB	0.010	0.006	1	NA	08/12/08 15:50	ND	

Approved By Sue Anderson Date : 8/19/08

Report By:NFallahi

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P0802625
Project:	JPL Groundwater Monitoring 3Q08 / G486090	**Date Analyzed:**	8/12/08

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: Sue Anderson Date: 8/19/08

ICCBMDL/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Battelle	**Service Request:**	P0802625
Project:	JPL Groundwater Monitoring 3Q08 / G486090	**Date Analyzed:**	8/12/08

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	0.0395	94
CCV1	0.0418	0.0395	94

Approved By: _____ Date: 8/19/08

CCV1A/120594

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P0802625
Project Name :	JPL Groundwater Monitoring 3Q08	**Date Collected :**	NA
Project Number :	G486090	**Date Received :**	NA
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	08/12/08

Laboratory Control Sample Summary
Inorganic Parameters

Sample Name :	Laboratory Control Sample	Units :	mg/L (ppm)
Lab Code :	P0802625-LCS	Basis :	NA
Test Notes :			

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	CAS Percent Recovery Acceptance Limits	Result Notes
Chromium, Hexavalent	None	7196A	0.040	0.0374	94	92-113	

Approved By _____ Date : 8/19/08

Report By:NFallahi

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client :	Battelle	**Service Request :**	P0802625
Project Name :	JPL Groundwater Monitoring 3Q08	**Date Collected :**	08/12/08
Project Number :	G486090	**Date Received :**	08/12/08
Sample Matrix :	WATER	**Date Extracted :**	NA
		Date Analyzed :	08/12/08

Matrix Spike/Duplicate Matrix Spike Summary

Sample Name : MW-16
Lab Code : P0802625-001MS P0802625-001DMS
Test Notes :

Units : mg/L (ppm)
Basis : NA

Analyte	Prep Method	Analysis Method	PQL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	Spike Recovery MS	Spike Recovery DMS	CAS Acceptance Limits	Relative Percent Difference	Result Notes
Chromium, Hexavalent	None	7196A	0.010	0.050	0.050	ND	0.0498	0.0488	100	98	82-114	2	

Approved By _____ Date : 8/19/08

Report By:NFallahi

DIVIDER SHEET

RAW DATA FOR

Hexavalent Chromium

ANALYSIS

Columbia Analytical Services inc.

pH Run Log

Service Request #(s): 2625

Time: 1340

Sample	VWR lot #	Exp.
pH 2 Buffer	519-0507080l	2/20/10
pH 4 Buffer	519-06030802	3/2010
pH 7 Buffer	6250	9130/08
pH 10 Buffer	519-01250806	6/09

Slope	Prep.Run #
99.2	—
	Run#
	—

pH in liquid: (1) 9040B, (2) 9040C (3) SM 4500 H+B (*Note method number in column labeled # below*)

pH in solid: (4) 9045C, (5) 9045D (*Note method number in column labeled # below*)

pH adjustment:(6) 7196A,(7) 7199,(8) 218.6,(9) SM 3500Cr-D,(10) SM 3500Cr-B (*Note method # In column labeled # *)

Sample	#	pH	Temp. °C	Sample	#	pH	Temp. °C
pH 4.000	6	4.008	22.7				
pH 7.000		7.002	22.7				
pH 10.000		9.996	22.7				
Ref#: T.V.=5.61 EXP: 7/2009 519-05050503B		5.600	22.7				
PH 2.000		2.012	22.7				
Di H2O		2.356	23.5				
PH 2.000		1.998	22.5				
PH 2.000 1440		2.010	22.6				
2625-1.01		2.171	14.1				
-2.01		2.189	15.0				
PH 2.000	✓	2.014	22.3				

Comments: ~~PH adjusted w/conc H2SO4 (EMD 47056, exp 9/13/10~~

* Soil or Solid prep: 1:1(wt:vol) with DI water:
** Samples received past recommended hold time.

Date buffers and filling solution changed: 8/11/08

Note: ATC probe used; therefore, temperature correction calculation is not necessary.

Analyst: NF Date: 8/12/08

Reviewer: [signature] Date: 8/12/08

Hexavalent Chromium (Liquids)

Columbia Analytical Services inc

Methods: (1) EPA 7196A; (2) SM 3500-Cr D; (3) SM 3500-Cr B

Service Request#(s): 2625 **Run#:** 123466

Stock#: 519-051208 01 exp 2/1/09 **Prep Run#:** —

ICV/CCV#: 519-072808 02 8/28/08 **Conc. H_2SO_4 Lot#:** EMD 47050 (exp 9/13/10)

~~0.0418~~ ppm 0.418 SMV 8/12/08 **Coloring Reagent Ref#:** 519-080408 01 (exp 9/4/08)

Working Curve:

Prep Dilution		*NA*	*0.05/50*	*0.25/50*	*0.5/50*	***Corr. Coeff.***
Concentration mg/L		*0.00*	*0.01*	*0.05*	*0.1*	0.999723
Absorbance @ 540 nm		0.000	0.008	0.046	0.096	

	Sample #	Method#	Sample Vol.(mL)	Dilution	pH ✓	Bkg.	Absorbance @ 540nm	Corrected Abs. (minus bkg.)	Results - mg/L	QA/QC - %R / RPD	
1	ICB	1	10	N/A	v	0.000	0.000	0.000	0.00112	<0.006	
2	ICV 0.0418ppm		5/50		✓		0.037	0.037	0.0395	94%	
3	MB				✓		0.000	0.000	0.00112	<0.006	
4	LCS 0.040ppm				✓		0.035	0.035	0.0374	94%	
5	2625-1-01				✓	0.000	0.000	0.000	0.00112	<0.006	
6	-1-01 MS				✓	0.000	0.047	0.047	0.0498	100%	RPD
7	-1-01 MSD				✓	0.000	0.046	0.046	0.0488	98%	2%
8	-2-01				✓	0.005	0.005	0.000	0.00112	<0.006	
9	CCV1				✓	0.000	0.037	0.037	0.0395	94%	
10	CCB1				✓	0.000	0.000	0.000	0.00112	<0.006	
11											
12											
13				Space not used							
14											
15											
16											
17											

pH Requirements: 7196A *(2 ± 0.5)* ; SM 3500-Cr D & B *(1 ± 0.3)* * Samples filtered prior to pH adjustment

MS/MSD spiked with 0.05 ml of 519-051208 01 **↑ 10 of pH adjusted sample (T.V.= 0.05 ppm)**

LCS spiked with ~~0.4~~ 0.2 **ml of** 519-051208 01 **↑** ~~10~~ 50 **of pH adjusted DI Water (T.V.= 0.04 ppm)**

Comments: NF 8/12/08

Prepared By: NF **Date/Time:** 8/12/08 1445

Analyzed By: NF **Date/Time:** 8/12/08 1550

Reviewed By: SMV **Date:** 8/12/08

S19-05010803 Ion RR

5/1/08
DC

Dissolve 0.5g 1,5-Diphenylcarbohydrazide (EMD S1134023 exp: 11/30/11) in 100 mL Methanol (B&J CR 348S exp: 9/22/09). Add to 1 L volumetric flask containing 500 mL DI water + 5.6 mL conc. H2SO4 (EMD AX1056 exp: 9/13/10). Bring up to volume w/ DI H2O; mix and degas.

Exp. 5/10/08

5/2/08 S19-05020801 Ion Exchange Cr^{6+} soln Tv=1.07ppb
DC

0.5 mL Ref S19-04040801 exp: 5/4/08 up to 100 mL with pH adjusted (pH= 9.414), degassed DI Water.

Exp. 5/10/08

5/5/08 S19-05050801 Ion Exch Cr^{6+} STD Tv = 0.334 ppm
DC

0.5mL of S19-11090702 (Tv = 66.8 ppm Exp. 7/20/08) ↑ 100mL w/DI H_2O

Exp. 6/5/08

5/5/08 S19-05050802 Cr^{6+} Coloring Reagent (Colorimetric)
DC

0.25g 1,5-Diphenylcarbohydrazide (EMD S1134023, Exp. 11/30/11) ↑ 50mL w/Acetone

Exp. 6/5/08

5/5/08 S19-05050803 A-F pH Ref Std (Tv = 5 of 7 pH units)
DC

Purchased from APG lot # 120125 Exp. 7/2009

5/10/08 S19-05060801 Ion Eluent
DC

200mL S19-03140805B (10X conc Exp. 1/9/09) ↑ 2L w/DI H_2O

Exp. 1/9/09

5/7/08 S19-05070801 pH 2.00 Buffer
DC

Purchased from ~~APG~~ VWR DC 5/7/08 Lot # 1802484

Exp. 2/2010

6/3/08 S19-060308O1 Hexavalent Chromium Standard
DC Purchased from APG Lot # 118065 TV: ~~83.6~~ 83.6 ppm DC 6/13/08
Will prep 0.5mL ↑100mL w/DI H2O for prep value of 0.418 ppm
Exp 6/2009

6/3/08 S19-060308O2 pH 4.00 Buffer (Red)
DC Purchased from VWR Lot # 13037799
Exp. 3/2010

6/3/08 S19-060308O3 Conductivity Std TV = 98.5 umhos/cm
DC Purchased from VWR Lot # 625665
Exp. 3/27/09

6/3/08 S19-060308O4 APB Conductivity Std TV: 990 umhos/cm
DC Purchased from VWR Lot # 566628
Exp. 4/10/09

toc 6/3/08 S19-060308O5 Conductivity Std TV = 9,934 umhos/cm
DC Purchased from VWR Lot # 625666
Exp. 3/17/09

6/6/08 S19-060608O1 TSS LCS
DC 0.0196g S18-091606O3 (EXP. 2010) ↑100mL w/DI H2O TV = 196ppm
Exp. 6/7/08

1/25/08 SIG-01250804 ICO1 ELUENT
JR 200ml SIG-01210805A (10X conc eluent; EXP:
UP TO 2L W/DI H2O
EXP: 1/9/09

1/25/08 SIG-01250805 IC02 ICV/CCV Cr VI Std Tv = 1.67 ppb
DR
0.5 mL Ref SIG-12240707; lot: 334PPB exp: 1/26/08 up to 100
mL with pH adjusted (pH= 9.302), degassed DI Water.
EXP: 1/26/08

1/25/08 SIG-01250806 PH 10.000 BUFFER
JR PURCHASED FROM VWR
LOT # 2712247
EXP: 6/2009

1/25/08 SIG-01250807 A,B,C,D,E PH FILLING SOLN 3M KC
JR PURCHASED FROM THERMO SCIENTIFIC
LOT CODE: LO1
EXP: 1/24/09

1/28/08 SIG-01280801 ICV/CCV Cr VI Std. Tv = 0.334 ppm
DR
0.5mL SIG-11190702 (Tv=0.8ppm exp 7/20/08) ↑ 100mL 10CI
EXP 2/28/08

1/29/08 SIG-01290801 0.1N H2SO4
JR 5.6ml Conc H2SO4 (EMD 44257F; exp: 1/31/08) ↑ 2L w/ DI
EXP: 1/31/08

1/29/08 SIG-01290801A 1000 PPM AMMONIA STD
JR 0.3141g NH4Cl (Mallinckrodt Lot 3384 A38588, EXP: 11/2/09)
W/ SIG-01290801 (0.1N H2SO4; EXP: 1/31/08)
EXP: 1/31/08.

5/8/08 SIG-05080801 1:1 HCl For SMO Preservation

QC 500mL DI H_2O + 500mL Conc HCl (EMD 45251 B, Exp. 11/15/08

Exp. 11/15/08

5/12/08 SIG-05120801 Cr^{VI} STD Tv = 10 ppm

QC 1mL of SIG-01220802 (1000 ppm Cr^{VI} STD, Exp. 2/1/09) ↑ 100mL w/DI H_2O

Exp. 2/1/09

1/21/08 SIG-01210803 Cr^{6+} Coloring Reagent (colorimetric)

DC 0.25g 1,5 Diphenylcarbohydrazide (EMD 31134623 EXP. 11/30/11)

↑ 50mL w/Acetone (EMD 45351A EXP 8/1/09)

EXP 2/21/08

1/21/08 SIG-01210804 ICOI Eluent

DC 200mL SIG-111307058 (10X conc. Eluent, EXP 11/13/08) ↑ 2L w/DI H_2O

EXP 11/13/08

1/21/08 SIG-01210805 A&B ICOI Eluent 10X conc.

DC 2.8564g $NaHCO_3$ (DESSICATED, EMD 43164351 EXP: 1/9/09)

+ 3.8164g Na_2CO_3 (DESSICATED, EMD 43353404C EXP: 3/12/09)

↑ 2L w/DI H_2O

EXP: 1/9/09

1/22/08 SIG-01220801 NO_2 (354.1) COLORING REAGENT + 52.5ml CONC HCl (EMD 45251; EXP 9/15)

IN 250ml VOLUMETRIC FLASK ADD 75ml DI H_2O + 2.5g SULFANILAMIDE (JT BAKER C36643; EXP: 5/10/12); MIX UNTIL DISSOLVED. THEN ADD 0.25g NED (JT BAKER A43623; EXP: 12/2009); MIX UNTIL DISSOLVED. THEN ADD 68g SODIUM ACETATE (EMD: 3346B018 A&B; EXP: 9/8/11) MIX UNTIL DISSOLVE THEN BRING UP TO VOLUME W/DI H_2O.

EXP: 2/22/08

1/22/08 SIG-01220802 Cr^{6+} 1000 ppm std.

DC certified concentration - 1000ppm

Purchased from IV Lot# A2-CR03009

EXP 2/1/2009

1/22/08 SIG-01220803 A&B Chloride 1000 ppm std for ICOI

Purchased from APG LOT # 120177

EXP: 4/2009

7/28/08
NF

7/28/08 S19-~~0~~ 07280802 ICV/CCV Cr^{6+} STD T.V = 0.418 PPm
/NF prep 0.5 ml S19-06030801 (T.V. 8.36 ppm exp 6/2009) ↑ 100 ml w/ DI H_2O
NF
exp 8/28/08

7/28/08 S19-07280803 TSS LCS
0.200g of S18-09160603 (EXP. 2010) ↑ 100mL w/DI H_2O T.V = 200 ppm
EXP. 7/29/08

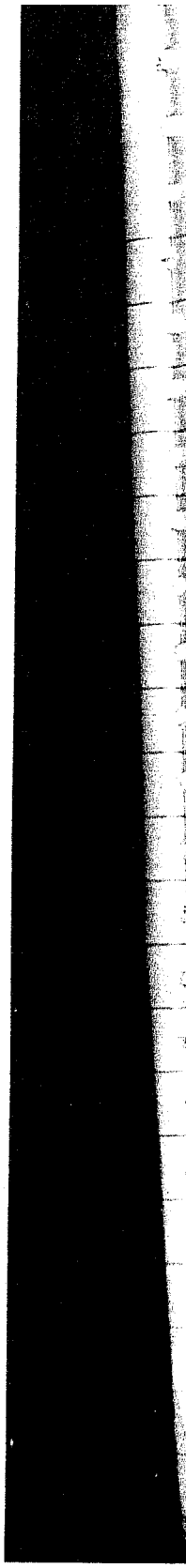
8/4/08 S19-08040801 Cr^{6+} coloring Reagent (colorimetric)
NF 0.25 g 1,5 Diphenylcarbohydrazide (EMD 31134623 exp 11/30/11
↑ 50 ml Acetone (EMD 45351C, exp 8/16/09)
EXP: 9/4/08 ~~exp~~ 8/4/08

8/5/08 S19-08050801 TSS LCS T.V = 214 PPM
0.0214g S19-09160603 (EXP 2010) ↑ 100ml w/ DI H_2O.
EXP: 8/6/08

8/11/08 S19-08110801 TSS LCS T.V = 198 PPM
0.0198g S19-09160603 (EXP: 2010) ↑ 100ml w/ DI H_2O
NF EXP 8/12/08

8/14/08 S19-08140801 Alkaline digestion soln
/NK 20.0g NaOH (EMD: 45176538D; EXP: 10/28/10) + 30.0g Na_2CO_3 (EMD 46327715A EXP: 10/11/17) ↑ 1L W/DI H_2O
EXP: 9/14/08

8/15/08 S19-08150801 TSS LCS T.V = 205 PPM
NF 0.0205g S19-09160603 (EXP: 2010) ↑ 100ml W/DI H_2O
EXP: 8/16/08



pH 7.000

		Date open	Date out
	VWR lot# 3117 rec'd 7/9/03 exp 4/30/2005	9/2/03	8/30/04
	VWR lot # 4110 Rec'd 8/13/04 mk exp 30 apr 2006	8/30/04	
7/15/05	VWR lot # 3075, Rec'd 6/24/05, Exp. 3/31/07 opened: 7/15/05 used up.	JAZ	
1/25/06 mk	Fisher Lot # 046866-24 exp 1/07 (from American Air		
1/26/06	RW VWR Lot 5332 Rec 1/26/06	1/27/06	
2/3/06	mk VWR Lot 5332B exp. 1/31/07.		
	RW VWR Lot 6205 exp ~~7/8/31~~ 7/31/08 DC 11/24/07	2/16/07 RW	
	RW VWR Lot 6250 exp 9/30/08 Rec 11/27/07		