

SWR0001

SOUTHWEST RESEARCH INSTITUTE™

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Chemistry and Chemical Engineering Division
Department of Analytical and Environmental Chemistry

December 4, 2000

Ms. Joan Kessner
Bechtel Hanford, Inc.
3190 George Washington Way
Richland, WA 99352

Subject: Analytical Results
SwRI Project 03046.06.075
SwRI Work Order 18688
Samples received 9-21-00

Dear Ms. Kessner:

Enclosed please find the analytical data for the above referenced samples, including a brief narrative description of the method and results. If you have any questions, please feel free to contact me at 210-522-5428.

Sincerely,



Mike Dammann
Manager

APPROVAL:



Michael G. MacNaughton, Ph.D., P.E.
Vice President

Enclosure

MD:lds

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JAN 22 2001
EDMC



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SOUTHWEST RESEARCH INSTITUTE
CLIENT: Bechtel Hanford, Inc.
SDG: 149996(B108M4)
SwRI Project Number: 01.03046.06.075
SwRI Work Order No.: 18688
VTSR: September 21, 2000

NARRATIVE

Southwest Research Institute
 Client: Bechtel Hanford, Inc.
 Project No. 01.03046.06.075
 SwRI Work Order 18688
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SwRI NARRATIVE

- Four (4) soil samples for Cr6 Analysis by Method 3060 and 7196A;

SwRI ID	Customer ID
149996	B108M4
149997	B108M5
149998	B108M6
149999	B108M7

- Samples were received at SwRI on September 21, 2000 for a twenty-eight (28) day turnaround from verified time of sample receipt (VTSR). Results were faxed on 10/20/00.
- Sample Quality Control Identification:

LCS
 B108M4 Duplicate

Hexavalent Chromium – SW846 3060A/7196A

The MDL Study yielded a MDL of 0.2 mg/kg, but we used a more realistic Reporting Limit (RL) of 0.8 mg/kg (based on dry weight) as the detection limit.

All holding times were met. The four samples were digested at the pH specified in 3060 and were analyzed by 7196A. The samples were corrected for the % solids. Sample B108M4 was analyzed in duplicate. For every sample, including the duplicate, three different matrix spikes were performed: a soluble Cr⁶⁺ standard, a Cr³⁺ standard and lead chromate, which is an insoluble form of Cr⁶⁺. All four samples were also analytically (post-digestion) spiked. Recoveries for the post digestion spikes were 91.0 – 95.7%, therefore the method of standard additions was not performed. The soluble Cr⁶⁺ spikes had recoveries of 86.6 – 94.6%, and 73.9 – 93.4% for the insoluble Cr⁶⁺ spikes. It seems as though sample B108M4 Cr³⁺ spike was inadvertently not spiked with Cr³⁺ due to the fact that the amount of Cr⁶⁺ found in the Cr³⁺ spike was 3.75 mg/kg, which is very close to that found in the unspiked sample and duplicate of 3.47 and 3.23 mg/kg, respectively. Also, the duplicate Cr³⁺ spike had a recovery of 16.8%, which was very consistent with the other three sample's Cr³⁺ spike recoveries of 17.6, 15.8 and 17.6%. Therefore it does appear that although the digestion procedure adequately solublizes the insoluble form of Cr⁶⁺, but possibly converts the Cr³⁺ to Cr⁶⁺.

Southwest Research Institute
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"I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Director or his designee, as verified by the following signature."



Jo Ann Boyd, Manager
Quality Assurance Unit Division 01

12/4/00

Date

SOUTHWEST RESEARCH INSTITUTE
CLIENT: Bechtel Hanford, Inc.
SDG: 149996(B108M4)
SwRI Project Number: 01.03046.06.075
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VTSR: September 21, 2000

CHAIN OF CUSTODY

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B99-005-144		Page 1 of 1			
Collector TRICE/COWGILL		Company Contact C. TRICE		Telephone No. 531-0601		Project Coordinator TRENT, SJ		Price Code 8K			
Project Designation 100 D Areas - Full Protocol		Sampling Location 100-D (Grp. 2 Pipeline)		SAF No. B99-005		Air Quality <input type="checkbox"/>		Data Turnaround 15 Days			
Ice Chest No. ERC 99.070 (LOFI)		Field Logbook No. EL-1339-7		COA R100DC2F00		Method of Shipment FEDEX					
Shipped To Southwest Research		Offsite Property No. A0000318		Bill of Lading/Air Bill No. 42357453 - 90919106				RT 9-20-00			
POSSIBLE SAMPLE HAZARDS/REMARKS Potentially Radioactive				Preservation		Cool 4C					
				Type of Container		aG					
				No. of Container(s)		1					
				Volume		60mL					
Special Handling and/or Storage Ship w/ice				Chromium Hex - 7196							
SAMPLE ANALYSIS								He to			
Sample No.		Matrix *	Sample Date	Sample Time							
B108M4 ✓		SOIL	9/19/00	0730	✓	INT lock		BOX 43	CZ-3		
B108M5 ✓		SOIL	9/19/00	0734	✓			↓	CZ-6		
B108M6 ✓		SOIL	9/19/00	0738	✓			↓	CZ-7		
B108M7 ✓		SOIL	9/19/00	0742	✓	✓		↓	CZ-15		
CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS				Matrix *			
Relinquished By CTRICE/Chia		Date/Time 9/19/00 1520		Received By Ref IA		Date/Time 9/20/00 0800		Samples stored in Ref. # IA at the 3728 Shipping Facility on 9/19/00 Collector not available to relinquish samples on 9/20/00 for shipment.			
Relinquished By R. Thoren		Date/Time 9/20/00 0800		Received By R. Thoren		Date/Time 9/20/00 0800					
Relinquished By B. Thoren		Date/Time 9/20/00 0900		Received By FEDEX		Date/Time					
Relinquished By		Date/Time		Received By		Date/Time					
Relinquished By		Date/Time		Received By		Date/Time					
LABORATORY SECTION		Received By Joe Mowitz		Title 9/21/00 - 0940		Date/Time					
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time					

Cooler temp 4.0°C

000003

Lab Name Southwest Research Institute		Page 1 of 1	
Received By (Print Name) Joe Morin Jr.		Log-in Date 09/22/2000	
Received By (Signature) <i>Joe Morin Jr.</i>			
Case Number B99-005-144		Sample Delivery Group No. 149996	SAS Number N/A
Remarks: 01-03046-06-075			
		Corresponding	
		EPA Sample #	Sample Tag #
		Assigned Lab #	
1. Custody Seal(s) / <input checked="" type="checkbox"/> Present <input type="checkbox"/> Absent* <input type="checkbox"/> Intact <input type="checkbox"/> Broken		B108M4	NONE
			149996
2. Custody Seal Nos. <u>N/A</u>		B108M5	NONE
			149997
		B108M6	NONE
			149998
3. Chain-of Custody Records <input checked="" type="checkbox"/> Present <input type="checkbox"/> Absent*		B108M7	NONE
			149999
4. Traffic Reports or Packing Lists <input type="checkbox"/> Present <input checked="" type="checkbox"/> Absent			
5. Airbill <input type="checkbox"/> Present <input checked="" type="checkbox"/> Absent*			
6. Airbill No. 423579539106			
7. Sample Tags <input type="checkbox"/> Present <input checked="" type="checkbox"/> Absent			
Sample Tag Numbers <input type="checkbox"/> Listed <input checked="" type="checkbox"/> Not listed on Chain of Custody			
8. Sample Condition Intact/Broken*/Leaking			
9. Cooler Temperature 4C			
10. Does Information on custody records, traffic reports, and sample tags agree? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No*			
11. Date Received at Lab 09/21/2000			
12. Time Received 09:40:00			
Sample Transfer			
Fraction <u>See Attached</u>		Fraction	
Area # <u>REFU</u>		Area # <u>9/22/00</u>	
By <u>JMK</u>		By <u>JMK</u>	
On <u>9/21/00</u>		On <u>9/22/00</u>	

* Contact SMO and attach record of resolution

Reviewed By <u>JMK</u>	Logbook No. Work Order (18688)
Date <u>9/22/00-11:25</u>	Logbook Page No. <u>3742</u>

SOUTHWEST RESEARCH INSTITUTE
CLIENT: Bechtel Hanford, Inc.
SDG: 149996(B108M4)
SwRI Project Number: 01.03046.06.075
SwRI Work Order No.: 18688
VTSR: September 21, 2000

**ELECTRONIC MAIL
COMMUNICATIONS**

Joe Morin

From: "Incognito2@CTC@SwRI26[<jboyd@chem.swri.edu>]"@swri.edu
Sent: Friday, September 15, 2000 2:14 PM
To: jmorin@chem.swri.edu;]@swri.edu, <Incognito2@CTC@SwRI26[;]@swri.edu>
Subject: FW: 10 CFR 830.120 and sample shipment

For sample being received next week.

Jo Ann Boyd, Manager
Southwest Research Institute
phone 210.522.2169
fax 210.522.2021
email JBoyd@SwRI.edu

-----Original Message-----

From: Koerner, C C (Chris) [mailto:CCKoerne@mail.bhi-erc.com]
Sent: Friday, September 15, 2000 12:09 PM
To: 'Jo Ann Boyd'
Cc: Kessner, Joan H; Weiss, Richard L
Subject: RE: 10 CFR 830.120 and sample shipment

Jo Ann --

The client has decided on:

Hexavalent chromium analysis by method 3060 and 7196.
Single extraction with spiked QC samples for soluble CrVI, insoluble CrVI,
and soluble CrIII on all samples.
\$250 per sample for a four-sample delivery group. QC samples are not
billable.

Chris Koerner

-----Original Message-----

From: Jo Ann Boyd [mailto:jboyd@chem.swri.edu]
Sent: Friday, September 15, 2000 10:02 AM
To: Koerner, C C (Chris)
Subject: RE: 10 CFR 830.120 and sample shipment

Mike mentioned you still had not decided the method for these samples.
He proposed a couple of approaches but did not know how you wanted
to go. Please let me know.

Jo Ann Boyd, Manager
Southwest Research Institute
phone 210.522.2169
fax 210.522.2021
email JBoyd@SwRI.edu

-----Original Message-----

From: Koerner, C C (Chris) [mailto:CCKoerne@mail.bhi-erc.com]
Sent: Friday, September 15, 2000 11:47 AM
To: 'Jo Ann Boyd'
Cc: Kessner, Joan H; Koberg, Karen K
Subject: RE: 10 CFR 830.120 and sample shipment

Jo Ann --

Thank you. Since the holding time on the original samples has expired, the project has decided to resample. I expect to have four new samples ready for shipment about Wednesday, September 20.

Will you be disposing of any residual sample material or returning it to us?

Is the cost of disposal for the residuals at your facility included in the pricing that Mike provided?

Upon completion of the analysis, preliminary results should be faxed to Joan

Kessner at (425) 969-4823. The final hard copy data package should be sent to:

Joan Kessner
Bechtel Hanford, Inc.
3190 George Washington Way
Richland, WA 99352

Chris Koerner, (509) 372-9301

-----Original Message-----

From: Jo Ann Boyd [mailto:jboyd@chem.swri.edu]
Sent: Friday, September 15, 2000 8:53 AM
To: Koerner, C C (Chris)
Subject: RE: 10 CFR 830.120 and sample shipment

Mike indicated they can start the analysis next week for a four week turnaround.

I will be revising the QAPP and will review and assure the items are provided

but I am not sure from reading the 10DFC180.120 what is actually missing.

I will review subparts carefully to include these items and provide you feedback.

The procurement person is Vicki Parr. When sending samples please send to my attention

with a chain of custody and requirements at:
Southwest Research Institute
6220 Culebra
San Antonio, Texas 78238

If you need anything else please let me know

Jo Ann Boyd, Manager
Southwest Research Institute
phone 210.522.2169
fax 210.522.2021
email JBoyd@SwRI.edu

-----Original Message-----

From: Koerner, C C (Chris) [mailto:CCKoerne@mail.bhi-erc.com]
Sent: Wednesday, September 13, 2000 8:06 PM
To: 'jboyd@swri.edu'; 'mdammann@swri.edu'
Cc: Kessner, Joan H; Weiss, Richard L; St John, David A; Gale, Stuart J (Jeff)
Subject: 10 CFR 830.120 and sample shipment

Jo Anne --

000007

This should follow-up our conversation from earlier today. Thank you for faxing the Quality Assurance Plan. It does meet the intent of DOE Order 5700.6c. I would like to receive a return email or fax stating that SwRI's program has also implemented the requirements of 10 CFR 830.120. According to my information, 10 CFR 830.120 has requirements for samples originating from a rad area that are not covered under DOE Order 5700.6c.

Mike --

If I can arrange it, I would like to have the four samples for hexavalent chromium analysis shipped sometime tomorrow. Can you send me the name of a procurement contact for SwRI and any special sample receiving information that you would like to have included on the packaging.

The hex cr holding time on these samples has been exceeded by a few days. Please let me know when the analysis can be started . . . and a preliminary estimate of how soon the results can be provided after sample receipt.

Thank you. I appreciate the help I have received from both of you.

Chris Koerner
(509) 372-9301

SOUTHWEST RESEARCH INSTITUTE
CLIENT: Bechtel Hanford, Inc.
SDG: 149996(B108M4)
SwRI Project Number: 01.03046.06.075
SwRI Work Order No.: 18688
VTSR: September 21, 2000

SAMPLE RESULTS

SOUTHWEST RESEARCH INSTITUTE 010001

SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute

Client: Bechtel Hanford, Inc.

Lab Code: SwRI

Date Received: 09/21/00

Matrix: Soil

Project No.: 01.03046.06.075

Work Order: 18688

Case #: B99-005-144

Sample ID	Lab System ID	Hexavalent Chromium result (mg/Kg)
Prep Blank	-----	<0.8
Lab Control	-----	40.2
True Value	-----	40.0
Recovery	-----	101%
B108M4	149996	3.47
Duplicate result	149996	3.23
RPD	149996	7.16%
B108M5	149997	0.885
B108M6	149998	0.565
B108M7	149999	3.81

ANALYTICAL SPIKE		
Sample ID	Lab System ID	Hexavalent Chromium result (mg/Kg)
B108M4	149996	21.9
True Value	149996	19.9
Recovery	149996	92.6%
B108M4 Duplicate	149996	21.8
True Value	149996	20.0
Recovery	149996	92.9%
B108M5	149997	19.5
True Value	149997	19.8
Recovery	149997	94.0%
B108M6	149998	19.6
True Value	149998	19.9
Recovery	149998	95.7%
B108M7	149999	22.1
True Value	149999	20.1
Recovery	149999	91.0%

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SOUTHWEST RESEARCH INSTITUTE 010002

SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute

Client: Bechtel Hanford, Inc.

Lab Code: SwRI

Date Received: 09/21/00

Matrix: Soil

Project No.: 01.03046.06.075

Work Order: 18688

Case #: B99-005-144

Cr3 SPIKE		
Sample ID	Lab System ID	Hexavalent Chromium result (mg/Kg)
B108M4	149996	3.75
True Value	149996	40.0
Recovery	149996	0.700%
B108M4 Duplicate	149996	9.84
True Value	149996	39.3
Recovery	149996	16.8%
B108M5	149997	7.99
True Value	149997	40.3
Recovery	149997	17.6%
B108M6	149998	6.79
True Value	149998	39.3
Recovery	149998	15.8%
B108M7	149999	10.8
True Value	149999	39.8
Recovery	149999	17.6%

Cr6 SPIKE		
Sample ID	Lab System ID	Hexavalent Chromium result (mg/Kg)
B108M4	149996	38.5
True Value	149996	39.8
Recovery	149996	88.0%
B108M4 Duplicate	149996	38.4
True Value	149996	40.1
Recovery	149996	87.7%
B108M5	149997	35.6
True Value	149997	40.1
Recovery	149997	86.6%
B108M6	149998	38.5
True Value	149998	40.1
Recovery	149998	94.6%
B108M7	149999	38.2
True Value	149999	39.4
Recovery	149999	87.3%

SOUTHWEST RESEARCH INSTITUTE 010003

SAMPLE ANALYSIS DATA SHEET

Lab Name: Southwest Research Institute

Client: Bechtel Hanford, Inc.

Lab Code: SwRI

Date Received: 09/21/00

Matrix: Soil

Project No.: 01.03046.06.075

Work Order: 18688

Case #: B99-005-144

INSOLUBLE Cr6 SPIKE		
Sample ID	Lab System ID	Hexavalent Chromium result (mg/Kg)
B108M4	149996	701
True Value	149996	747
Recovery	149996	93.4%
B108M4 Duplicate	149996	714
True Value	149996	810
Recovery	149996	87.7%
B108M5	149997	552
True Value	149997	746
Recovery	149997	73.9%
B108M6	149998	578
True Value	149998	694
Recovery	149998	83.2%
B108M7	149999	706
True Value	149999	810
Recovery	149999	86.7%

SOUTHWEST RESEARCH INSTITUTE
CLIENT: Bechtel Hanford, Inc.
SDG: 149996(B108M4)
SwRI Project Number: 01.03046.06.075
SwRI Work Order No.: 18688
VTSR: September 21, 2000

RAW DATA

Southwest Research Institute

Electronic Bench Sheet
Hexavalent Chromium(7/96)

R. Spis
11/20/00
010004

Project #: 01.03046.06.075
Client: Bechtel Hanford
Method: SW 846 7196A
WO# 18688

Date: 10/19/00
Analyst: PBL
MDL: 0.02 mg/L

Standardization:

Standard mg/L	Calc mg/L	Absorbance @540nm
0.00	-0.01	0.000
0.02	0.01	0.017
0.10	0.10	0.081
0.50	0.51	0.401
1.00	1.02	0.797
2.00	1.99	1.542

Regression Output:

Constant	-0.00847
Std Err of Y Est	0.015239
R Squared	0.999698
No. of Observations	6
Degrees of Freedom	4
X Coefficient(s)	1.293448
Std Err of Coef.	0.01124

NOTES: Cr⁶⁺ is 17-11-WCSI 1000 mg/L
Cr³⁺ is Inorganic # 2235 1000 mg/L
PbCO₃ is Inorganic # 2186

FV Colored: 10 ml Sig Figs: 3

Seq #	Sample ID	Sample Mass (g)	FV (ml)	% solids	Dilution Factor	Abs @540nm	Conc. mg/L or mg/kg	Comments
1	ICV	10	10	100.00%	1	0.823	1.06	106.0% R, TV = 1.00 mg/L
2	ICB	10	10	100.00%	1	0.000	<0.02	
3	149996	2.53	100	99.29%	1	0.074	3.47	
4	149996D	2.52	100	99.29%	1	0.069	3.23	
5	149997	2.54	105	99.37%	1	0.023	0.885	
6	149998	2.52	105	99.68%	1	0.017	0.565	
7	149999	2.51	100	99.25%	1	0.080	3.81	
8	149996 AS	2.53	100	99.29%	1	0.432	21.9	92.6% R, TV = 19.9 mg/kg
9	149996D AS	2.52	100	99.29%	1	0.429	21.8	92.9% R, TV = 20.0 mg/kg
10	149997 AS	2.54	100	99.37%	1	0.387	19.5	94.0% R, TV = 19.8 mg/kg
11	149998 AS	2.52	100	99.68%	1	0.388	19.6	95.6% R, TV = 19.9 mg/kg
12	149999 AS	2.51	100	99.25%	1	0.433	22.1	91.1% R, TV = 20.1 mg/kg
13	CCV	10	10	100.00%	1	0.828	1.06	106.0% R, TV = 1.00 mg/L
14	CCB	10	10	100.00%	1	-0.001	<0.02	
15	149996 CR3	2.52	100	99.29%	1	0.079	3.75	0.701% R, TV = 40.0 mg/kg
16	149996D CR3	2.56	100	99.29%	1	0.200	9.84	16.8% R, TV = 39.3 mg/kg
17	149997 CR3	2.50	100	99.37%	1	0.160	7.99	17.7% R, TV = 40.3 mg/kg
18	149998 CR3	2.55	100	99.68%	1	0.140	6.79	15.8% R, TV = 39.3 mg/kg
19	149999 CR3	2.53	100	99.25%	1	0.217	10.8	17.6% R, TV = 39.8 mg/kg
20	CCV	10	10	100.00%	1	0.831	1.07	107.0% R, TV = 1.00 mg/L
21	CCB	10	10	100.00%	1	-0.001	<0.02	
22	149996 CR6	2.53	100	99.29%	1	0.755	38.5	88.0% R, TV = 39.8 mg/kg
23	149996D CR6	2.51	100	99.29%	1	0.746	38.4	87.6% R, TV = 40.1 mg/kg
24	149997 CR6	2.51	100	99.37%	1	0.693	35.6	86.6% R, TV = 40.1 mg/kg
25	149998 CR6	2.50	100	99.68%	1	0.748	38.5	94.5% R, TV = 40.1 mg/kg
26	149999 CR6	2.56	100	99.25%	1	0.756	38.2	87.4% R, TV = 39.4 mg/kg
27	CCV	10	10	100.00%	1	0.833	1.07	107.0% R, TV = 1.00 mg/L
28	CCB	10	10	100.00%	1	0.001	<0.02	
29	149996 IS	2.56	100	99.29%	20	0.695	701	93.4% R, TV = 747 mg/kg
30	149996D IS	2.50	100	99.29%	20	0.692	714	87.7% R, TV = 810 mg/kg
31	149997 IS	2.54	100	99.37%	20	0.545	552	73.9% R, TV = 746 mg/kg
32	149998 IS	2.56	100	99.68%	20	0.577	578	83.3% R, TV = 694 mg/kg
33	149999 IS	2.50	100	99.25%	20	0.684	706	86.6% R, TV = 810 mg/kg
34	CCV	10	10	100.00%	1	0.837	1.07	107.0% R, TV = 1.00 mg/L
35	CCB	10	10	100.00%	1	0.000	<0.02	
36	PB	2.5	100	100.00%	1	0.006	<0.08	
37	LCS	2.5	100	100.00%	1	0.784	40.2	101% R, TV = 40 mg/kg
38	CCV	10	10	100.00%	1	0.759	0.973	97.3% R, TV = 1.00 mg/L
39	CCB	10	10	100.00%	1	0.002	<0.02	

Southwest Research Institute
Logbook: WC Sample Prep - V 010005

Analysis:
Method: (circle)
Client:

Cr⁶⁺ 3000
Digestion / Distillation / Extraction / Bomb
Bechtel Hanford

Project# 01.03046.06.075
WO# 18688

Notes / Prep: Cr⁶⁺ = 17-11-WCSI 1000 mg/L
Cr³⁺ = Inorg # 2185 1000 mg/L
PbCO₃ = Inorg # 2186

Sample ID	Sample Wt(g) Sample Vol(ml)	Final Volume (ml)	
PB		100	
LCS			0.1 ml Cr ⁶⁺ std
149996	2.53		11.8 mg PbCO ₃
IS	2.56		11.22 mg PbCO ₃
Cr ³⁺	2.52		0.1 ml Cr ³⁺ std
↓ Cr ⁶⁺	2.53		0.1 ml Cr ⁶⁺ std
149996D	2.52		12.5 mg PbCO ₃
B	2.50		11.7 mg PbCO ₃
Cr ³⁺	2.56		
↓ Cr ⁶⁺	2.51		
149997	2.59	105	11.7 mg PbCO ₃
B	2.54	100	9.94 mg PbCO ₃
Cr ³⁺	2.50	100	
↓ Cr ⁶⁺	2.51	100	
149998	2.52	105	11.0 mg PbCO ₃
IS	2.56	100	10.27 mg PbCO ₃
Cr ³⁺	2.55		
↓ Cr ⁶⁺	2.50		
149999	2.51		12.5 mg PbCO ₃
B	2.50		11.50 mg PbCO ₃
Cr ³⁺	2.53		
↓ Cr ⁶⁺	2.56		

Analyst Signature: Paulina Buener

Date: 10/18/00

Reviewed by: [Signature]

Date: 10/31/00

Southwest Research Institute
 Logbook: Miscellaneous - IV 010006

Analysis / Method: Cr6+ 3060
 Client: Bechtel Hanford

Project# 01.03046.06.0075
 WO# 19688

RJ 10/21/00

Notes / Prep: Cr6+ = 17-11-WBCSI 1000mg/L
Cr6+ = 1norg# 2235 1000mg/L
PbCO3 = 1norg# 2186

Standard Stock ID: _____

19 OCT 2000 09:19:14
 Application: bSTANDARD CURVE
 Model: LINREGR
 Test name: CR6
 ABS Correction: NONE
 Wavelength: 540.0
 Units: mg/L
 Slope=0.7729 Intercept=0.007
 StdDev=0.011780 Corr.Coeff.=1.000

19 OCT 2000 09:22:24
 Application: STANDARD CURVE
 Model: LINREGR
 Test name: CR6
 ABS Correction: NONE
 Wavelength: 540.0
 Units: mg/L
 Slope=0.7729 Intercept=0.007
 StdDev=0.011780 Corr.Coeff.=1.000

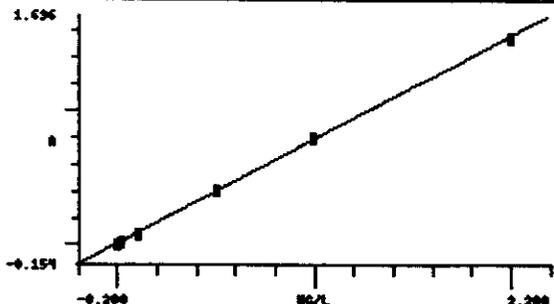
*Pauline Jugar
 10/20/00*

Std	CONC	ABS
1	0.00000	0.000
2	0.02000	0.017
3	0.10000	0.081
4	0.50000	0.401
5	1.0000	0.797
6	2.0000	1.542

ID	ABS	CONC
ICV	0.823	1.0562
ID	ABS	CONC
ICB	0.000	-0.00865
ID	ABS	CONC
149996	0.074	0.087092
ID	ABS	CONC
149996D	0.069	0.080623
ID	ABS	CONC
149997	0.023	0.021106
ID	ABS	CONC
149998	0.017	0.013343
ID	ABS	CONC
149999	0.080	0.094855
ID	ABS	CONC
149996AS	0.432	0.55029
ID	ABS	CONC
149996DAS	0.429	0.54640
ID	ABS	CONC
149997AS	0.387	0.49206
ID	ABS	CONC
149998AS	0.388	0.49336
ID	ABS	CONC
149999AS	0.433	0.55158

*Pauline Jugar
 10/20/00*

STANDARD CURVE LINREGR



Slope=0.7729 Intercept=0.007
 StdDev=0.011780 Corr.Coeff.=1.000

Calculation:

Analyst Signature: *Pauline Jugar*

Date: 10/20/00

Reviewed by: *RJ*

Date: 10/31/00

Pauline Jugar 10/20/00

Southwest Research Institute
Logbook: Miscellaneous - IV

010007

Analysis / Method: Cr 6+ 3060
Client: Bechtel Hanford

Project# 01.03046.06.075
WO# 18688

Notes / Prep: see pg. 04189

Standard Stock ID: _____

Pauline Jones 10/20/00

Pauline Jones 10/20/00

Pauline Jones 10/20/00

Sample ID			Sample ID		
ID	ABS	CONC	ID	ABS	CONC
CCV	0.828	1.0626	CCV	0.833	1.0691
ID	ABS	CONC	ID	ABS	CONC
CCB	-0.001	-0.00995	CCB	0.001	-0.00736
ID	ABS	CONC	ID	ABS	CONC
149996CR3	0.079	0.093561	149996IS	0.695	0.89057
ID	ABS	CONC	ID	ABS	CONC
149996DCR3	0.200	0.25012	149996DIS	0.692	0.88668
ID	ABS	CONC	ID	ABS	CONC
149997CR3	0.160	0.19836	149997IS	0.545	0.69649
ID	ABS	CONC	ID	ABS	CONC
149998CR3	0.140	0.17249	149998IS	0.577	0.73789
ID	ABS	CONC	ID	ABS	CONC
149999CR3	0.217	0.27211	149999IS	0.684	0.87633
ID	ABS	CONC	ID	ABS	CONC
CCV	0.831	1.0665	CCV	0.837	1.0743
ID	ABS	CONC	ID	ABS	CONC
CCB	-0.001	-0.00995	CCB	0.000	-0.00865
ID	ABS	CONC			
149996CR6	0.755	0.96820			
ID	ABS	CONC			
149996DCR6	0.746	0.95655			
ID	ABS	CONC	ID	ABS	CONC
149997CR6	0.693	0.88798	PB	0.006	-0.00089
ID	ABS	CONC	ID	ABS	CONC
149998CR6	0.748	0.95914	LCS	0.784	1.0057
ID	ABS	CONC	ID	ABS	CONC
149999CR6	0.756	0.96949	CCV	0.759	0.97337
			ID	ABS	CONC
			CCB	0.002	-0.00686
Calculation:					

Analyst Signature: _____

Pauline Jones
RSM

Date: _____

10/20/00
10/31/00

Reviewed by: _____

Date: _____