B01901-TMA-246

TMA

0045511

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WESTINGHOUSE HANFORD COMPANY

Results of Analyses For:

METALS & HEXAVALENT CHROMIUM
(Skinner & Sherman Work Order S2-09-415)

TMA Master Work Order # N2-09-149

October 13, 1992

OCT 1996
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1 SW 7-16-96

TMA
Thermo Analytical Inc.

Skinner & Sherman Labs., Inc.
300 Second Avenue
Post Office Box 521
Waltham, MA 02254-0521
(617) 890-7200
FAX (617) 890-3883

October 7, 1992

TMA/NORCAL
2030 Wright Avenue
Richmond, CA 94804
Attention: Dan Stuermer

Quality Control Narrative

Scope
Six (6) soil samples were submitted to TMA/Skinner & Sherman Laboratories, Inc. on September 22, 1992 from TMA/Norcal. The samples were analyzed for the USEPA CLP TAL metals plus Hexavalent Chromium without mercury. The analysis were performed under TMA/Skinner and Sherman work order S209415.

Methodology
The samples were prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program Statement of Work (ILM02). Hexavalent Chromium was extracted by EPA SW-846 Method 3060 and analyzed by EPA SW-846 Method 7197.

Discussion
All quality control requirements were met for the samples with the following exceptions:

The hexavalent chromium, antimony, arsenic and selenium digestion spike recovery exceeded the control limit requirements.

Please feel free to call if there are any questions concerning this package.

Respectfully submitted,

TMA/SKINNER & SHERMAN LABORATORIES, INC.

(for)

David N. Peterson
Assistant Laboratory Manager

1a 7/11/96

WESTINGHOUSE/HANFORD

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: RUSH! T/A SAS No.: SDG No.: B01901

SOW No.: ILM02.1

SAMPLE NUMBER:	Lab Sample ID.
B01901	09415-01S
B01902	09415-02S
B01903	09415-03S
B01905	09415-04S
B01906	09415-05S
B01907	09415-06S
B01907D	09415-06S2
B01907S	09415-06DS

Were ICP interelement corrections applied? Yes/No YES
Were ICP background corrections applied? Yes/No YES
If yes-were raw data generated before application of background corrections? Yes/No NO

Comments:

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 and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Steven Provencal Name: Steven R. Provencal

Date: 10/5/92 Title: ICP Spectroscopist

WESTINGHOUSE/HANFORD
1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B01901

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: RUSH! T/ASAS No.: SDG No.: B01901

Matrix (soil/water): SOIL Lab Sample ID: 09415-01S

Level (low/med): LOW Date Received: 09/22/92

% Solids: 100.0

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	39.3			P
7440-36-0	Antimony	3.1	U	N	P
7440-38-2	Arsenic	0.50	U	WN	F
7440-39-3	Barium	0.34	B		P
7440-41-7	Beryllium	0.08	U		P
7440-43-9	Cadmium	0.26	U		P
7440-70-2	Calcium	38.0	B		P
7440-47-3	Chromium	0.70	U		P
7440-48-4	Cobalt	0.43	U		P
7440-50-8	Copper	11.3			P
7439-89-6	Iron	245			P
7439-92-1	Lead	0.32	U		F
7439-95-4	Magnesium	19.1	B		P
7439-96-5	Manganese	0.25	U		P
7439-97-6	Mercury				NR
7440-02-0	Nickel	1.1	U		P
7440-09-7	Potassium	14.5	U		P
7782-49-2	Selenium	0.93	B	N	F
7440-22-4	Silver	0.43	U		P
7440-23-5	Sodium	9.3	B		P
7440-28-0	Thallium	0.82	U	W	F
7440-62-2	Vanadium	0.62	U		P
7440-66-6	Zinc	2.1	B		P
	Cyanide				NR

Color Before: WHITE Clarity Before: Texture: FINE

Color After: WHITE Clarity After: Artifacts:

Comments:
HEXAVALENT CHROMIUM = <0.50 MG/KG

02

WESTINGHOUSE/HANFORD
1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B01902

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: RUSH! T/ASAS No.: SDG No.: B01901

Matrix (soil/water): SOIL Lab Sample ID: 09415-02S

Level (low/med): LOW Date Received: 09/22/92

% Solids: 97.6

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5400			P
7440-36-0	Antimony	3.2	U	N	P
7440-38-2	Arsenic	2.0		N	F
7440-39-3	Barium	63.3			P
7440-41-7	Beryllium	0.15	B		P
7440-43-9	Cadmium	0.27	U		P
7440-70-2	Calcium	4350			P
7440-47-3	Chromium	12.1			P
7440-48-4	Cobalt	6.9	B		P
7440-50-8	Copper	21.7			P
7439-89-6	Iron	16900			P
7439-92-1	Lead	4.5			F
7439-95-4	Magnesium	3640			P
7439-96-5	Manganese	248			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	8.8			P
7440-09-7	Potassium	1180			P
7782-49-2	Selenium	1.1		+N	F
7440-22-4	Silver	2.0			P
7440-23-5	Sodium	207	B		P
7440-28-0	Thallium	0.86	U		F
7440-62-2	Vanadium	27.0			P
7440-66-6	Zinc	31.8			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts: YES

Comments:
STONES, ROOTS
HEXAVALENT CHROMIUM = <0.50 MG/KG

03

WESTINGHOUSE/HANFORD
1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B01903

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: RUSH! T/ASAS No.: SDG No.: B01901

Matrix (soil/water): SOIL Lab Sample ID: 09415-03S

Level (low/med): LOW Date Received: 09/22/92

% Solids: 97.3

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6960			P
7440-36-0	Antimony	3.3	U	N	P
7440-38-2	Arsenic	2.3		N	F
7440-39-3	Barium	67.8			P
7440-41-7	Beryllium	0.18	B		P
7440-43-9	Cadmium	0.28	U		P
7440-70-2	Calcium	5040			P
7440-47-3	Chromium	15.1			P
7440-48-4	Cobalt	8.4	B		P
7440-50-8	Copper	19.3			P
7439-89-6	Iron	18900			P
7439-92-1	Lead	4.2			F
7439-95-4	Magnesium	4330			P
7439-96-5	Manganese	281			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	10.6			P
7440-09-7	Potassium	1380			P
7782-49-2	Selenium	3.8	U	WN	F
7440-22-4	Silver	1.8	B		P
7440-23-5	Sodium	238	B		P
7440-28-0	Thallium	0.88	U		F
7440-62-2	Vanadium	36.3			P
7440-66-6	Zinc	34.8			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:
HEXAVALENT CHROMIUM = 1.32 MG/KG

04

WESTINGHOUSE/HANFORD
1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B01905

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: RUSH! T/ASAS No.: SDG No.: B01901

Matrix (soil/water): SOIL Lab Sample ID: 09415-04S

Level (low/med): LOW Date Received: 09/22/92

% Solids: 97.7

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6930			P
7440-36-0	Antimony	3.3	U	N	P
7440-38-2	Arsenic	2.1		N	F
7440-39-3	Barium	77.4			P
7440-41-7	Beryllium	0.18	B		P
7440-43-9	Cadmium	0.28	U		P
7440-70-2	Calcium	3700			P
7440-47-3	Chromium	27.8			P
7440-48-4	Cobalt	8.7	B		P
7440-50-8	Copper	15.8			P
7439-89-6	Iron	20100			P
7439-92-1	Lead	6.3			F
7439-95-4	Magnesium	4050			P
7439-96-5	Manganese	309			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	9.3			P
7440-09-7	Potassium	1710			P
7782-49-2	Selenium	0.73	U	WN	F
7440-22-4	Silver	1.9	B		P
7440-23-5	Sodium	153	B		P
7440-28-0	Thallium	0.85	U		F
7440-62-2	Vanadium	33.7			P
7440-66-6	Zinc	36.8			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts: YES

Comments:
STONES
HEXAVALENT CHROMIUM = <0.50 MG/KG

05

SAMPLE NUMBER:

B01906

INORGANIC ANALYSIS DATA SHEET

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: RUSH! T/ASAS No.: SDG No.: B01901

Matrix (soil/water): SOIL Lab Sample ID: 09415-05S

Level (low/med): LOW Date Received: 09/22/92

% Solids: 97.6

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6480			P
7440-36-0	Antimony	3.8	B	N	P
7440-38-2	Arsenic	1.5	B	N	F
7440-39-3	Barium	69.2			P
7440-41-7	Beryllium	0.18	B		P
7440-43-9	Cadmium	0.28	U		P
7440-70-2	Calcium	3730			P
7440-47-3	Chromium	15.3			P
7440-48-4	Cobalt	7.9	B		P
7440-50-8	Copper	13.4			P
7439-89-6	Iron	16500			P
7439-92-1	Lead	4.1			F
7439-95-4	Magnesium	3860			P
7439-96-5	Manganese	297			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	8.4			P
7440-09-7	Potassium	1540			P
7782-49-2	Selenium	0.70	U	+N	F
7440-22-4	Silver	1.9	B		P
7440-23-5	Sodium	147	B		P
7440-28-0	Thallium	0.82	U		F
7440-62-2	Vanadium	33.7			P
7440-66-6	Zinc	35.7			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

HEXAVALENT CHROMIUM = <0.50 MG/KG

03

WESTINGHOUSE/HANFORD
1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B01907

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: RUSH! T/ASAS No.: SDG No.: B01901

Matrix (soil/water): SOIL Lab Sample ID: 09415-06S

Level (low/med): LOW Date Received: 09/22/92

% Solids: 97.2

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7960			P
7440-36-0	Antimony	3.8	B	N	P
7440-38-2	Arsenic	1.2	B	WN	F
7440-39-3	Barium	80.2			P
7440-41-7	Beryllium	0.27	B		P
7440-43-9	Cadmium	0.26	U		P
7440-70-2	Calcium	4380			P
7440-47-3	Chromium	11.0			P
7440-48-4	Cobalt	9.6			P
7440-50-8	Copper	14.8			P
7439-89-6	Iron	19500			P
7439-92-1	Lead	4.7			F
7439-95-4	Magnesium	4500			P
7439-96-5	Manganese	330			P
7439-97-6	Mercury				NR
7440-02-0	Nickel	10.4			P
7440-09-7	Potassium	1600			P
7782-49-2	Selenium	0.75	U	MWN	F
7440-22-4	Silver	2.2			P
7440-23-5	Sodium	174	B		P
7440-28-0	Thallium	0.87	U		F
7440-62-2	Vanadium	42.1			P
7440-66-6	Zinc	40.0			P
	Cyanide				NR

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts: YES

Comments:
STONES
HEXAVALENT CHROMIUM = <50 MG/KG

07

TMA
Thermo Analytical Inc.

TMA/Norcal
2030 Wright Avenue
P. O. Box 4040
Richmond, CA 94804-0040
(510) 235-2633 Fax No. (510) 235-0438

OCT 1992
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October 2, 1992

SENT BY FEDERAL EXPRESS

Ref. TMA/Norcal N2-09-168-7088

Mr. John Bourgeault
Westinghouse Hanford Company
2355 Stevens Drive
Richland, WA 99352

Dear Mr. Bourgeault:

Enclosed on the Summary Data Section are the gamma scan results for the soil samples from SAF#92-311, sodium dichromate Barrel 100-IV-4 Location, we received 21 September 1992. The QA/QC results are also given in the Summary Data Section. The samples were processed on the rush basis. The Summary Data Including QC's and appendices are found in pages 1 through 121.

Please call if you have any questions concerning this data.

Sincerely,

D. P. Kharkar

Dinkar P. Kharkar, Ph.D.
Manager, Nuclear Programs

DPK/jv

Enclosures: Sections 1 and 2
Appendices

i 7/16/96

SDG 7088 Contact Dinkar P. Kharkar	Client Westinghouse Hanford Contract MBH-SVV-069262

CASE NARRATIVE

1.0 GENERAL

The result of the soil samples from Location 100-IV-4, SAF#92-311, sodium dichromate (TMA/Norcal Group 7088) are reported herein. TMA/Norcal Group 7088 is comprised of the six samples listed on the Chain-of-Custody documents and is identified as Sample 1 through 6.

1.1 CHAINS-OF-CUSTODY

This report includes data from samples delivered under Chain-of-Custody documents Field Logbook No. WHC-N-205-19.

1.2 SAMPLE VOLUME

1000 mL bottles of sample were received for the analyses.

1.3 MISSING SAMPLES

All samples were accounted for in an undamaged condition.

1.4 HOLDING TIMES

The collections were made on 9/17/92 and the sample processing was initiated within 180 days of collection.

2.0 QUALITY CONTROL

The internal quality control consisted of one sample each of a laboratory control, a blank, and a replicate. All original analyses were performed with QC samples 7088-7, 8, and 9.

The QC samples were prepared and labelled by the quality control officer. Copies of The QC notebook pages are included in the data package.

2.1 LABORATORY CONTROL SAMPLES

LCS recoveries for the gamma nuclides used in the spike were good. The MDA's for ^{59}Fe, ^{152}Eu, ^{154}Eu, and ^{156}Eu were higher than the RDL because small aliquots were used for the analysis instead of 750 g required by MDA calculations.

2.2 BLANKS

MDA's for the gamma nuclides did not meet the RDL requirement. Sample aliquots smaller than the aliquot required by MDA calculations were used for the gamma analysis.

SDG 7088 Contact Dinkar P. Kharkar	Client Westinghouse Hanford Contract MBH-SVV-069262

CASE NARRATIVE

2.3 REPLICATES

Results were satisfactory for the replicate analysis. The MDA's of gamma nuclides in the replicate sample were higher due to the small aliquot available for gamma analysis. The MDA's of gamma nuclides in the original sample were below RDL except for ^{59}Fe which was 0.058 pCi/g, slightly higher than the required RDL of 0.050 pCi/g due to Compton background contributed by thorium in the sample.

3.0 ANALYTICAL NOTES

3.1 Gamma Scan Analyses: Gamma scan analysis did not find positive concentrations of gamma nuclides. The MDA's for ^{59}Fe, ^{60}Co, and ^{137}Cs for the sample 7088-2 and the MDA for ^{59}Fe in the sample 7088-3 were higher than the required MDL because only 670 g to 690 g were available for gamma analysis instead of 750 g required by MDA calculations. The MDA's for ^{59}Fe are higher than the RDL in all samples because of the high Compton background contributed by thorium in the sample.

N209168-09

TMA NORCAL

REPORTING GROUP 7088

REPLICATE

B01901

SDG 7088
Contact Dinkar Kharkar

Client Westinghouse Hanford
Contract MBH-SVV-069262

REPLICATE
Lab sample id N209168-09
Dept sample id 7088-009

ORIGINAL
Lab sample id N209168-01
Dept sample id 7088-001
Received 09/21/92

Client sample id B01901
Matrix SOIL
Collected 09/17/92
Chain of custody id 003023

PARAMETER	REPLICATE pCi/G	2σ ERR (COUNT)	MDA pCi/G	RDL pCi/G	QUALI-FIERS	TEST	ORIGINAL pCi/G	2σ ERR (COUNT)	MDA pCi/G	QUALI-FIERS	RPD %	3σ PROT TOT LIMIT
GAMMA SCAN ANALYTES												
Potassium 40	U		1.5		U	GAM	0.33	0.28			128	300
Iron 59	U		0.30	0.050	U	GAM	U		0.058	U	-	
Chromium 51	U		0.74		U	GAM	U		0.19	U	-	
Cobalt 60	U		0.098	0.050	U	GAM	U		0.013	U	-	
Zinc 65	U		0.15		U	GAM	U		0.025	U	-	
Ruthenium 106	U		0.75		U	GAM	U		0.33	U	-	
Cesium 134	U		0.072		U	GAM	U		0.020	U	-	
Cesium 137	U		0.074	0.050	U	GAM	U		0.020	U	-	
Europium 152	U		0.12	0.10	U	GAM	U		0.045	U	-	
Europium 154	U		0.079	0.10	U	GAM	U		0.029	U	-	
Radium 226	U		0.19	0.10	U	GAM	0.16	0.043			17	171
Thorium 228	U		0.12		U	GAM	0.16	0.043			29	142
Thorium 232	U		0.35		U	GAM	U		0.15	U	-	

Lab id TMAN
Protocol WHC-HEIS
Version Ver 1.0
Form DVD-REP
Version 2.17
Report date 10/02/92

N209168-01

TMA NORCAL
REPORTING GROUP 7088

DATA SHEET

B01901

SDG 7088
Contact Dinkar Kharkar

Client Westinghouse Hanford
Contract MBH-SVV-069262

Lab sample id N209168-01
Dept sample id 7088-001
Received 09/21/92

Client sample id B01901
Matrix SOIL
Collected 09/17/92
Chain of custody id 003023

PARAMETER	CAS NO	RESULT pCi/G	2σ ERR (COUNT)	MDA pCi/G	RDL pCi/G	QUALI-FIERS	TEST
GAMMA SCAN ANALYTES							
Potassium 40	13966-00-2	0.33	0.28				GAM
Iron 59		U		0.058	0.050	U	GAM
Chromium 51	14392-02-0	U		0.19		U	GAM
Cobalt 60	10198-40-0	U		0.013	0.050	U	GAM
Zinc 65	17982-39-3	U		0.025		U	GAM
Ruthenium 106	13967-48-1	U		0.33		U	GAM
Cesium 134	17967-70-9	U		0.020		U	GAM
Cesium 137	10045-97-3	U		0.020	0.050	U	GAM
Europium 152	14683-23-9	U		0.045	0.10	U	GAM
Europium 154	15585-10-1	U		0.029	0.10	U	GAM
Radium 226	13982-67-7	0.16	0.043		0.10		GAM
Thorium 228	14274-82-9	0.16	0.043				GAM
Thorium 232	7440-29-1	U		0.15		U	GAM

Lab id TMAN
Protocol WHC-HEIS
Version Ver 1.0
Form DVD-DS
Version 2.17
Report date 10/02/92

N209168-02

TMA NORCAL
REPORTING GROUP 7088

DATA SHEET

B01902

SDG	7088	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N209168-02	Client sample id	B01902
Dept sample id	7088-002	Matrix	SOIL
Received	09/21/92	Collected	09/17/92
		Chain of custody id	003023

PARAMETER	CAS NO	RESULT pCi/G	2σ ERR (COUNT)	MDA pCi/G	RDL pCi/G	QUALI-FIERS	TEST
GAMMA SCAN ANALYTES							
Potassium 40	13966-00-2	14	1.1				GAM
Iron 59		U		0.18	0.050	U	GAM
Chromium 51	14392-02-0	U		0.38		U	GAM
Cobalt 60	10198-40-0	U		0.061	0.050	U	GAM
Zinc 65	17982-39-3	U		0.13		U	GAM
Ruthenium 106	13967-48-1	U		0.42		U	GAM
Cesium 134	17967-70-9	U		0.056		U	GAM
Cesium 137	10045-97-3	U		0.056	0.050	U	GAM
Europium 152	14683-23-9	U		0.091	0.10	U	GAM
Europium 154	15585-10-1	U		0.066	0.10	U	GAM
Radium 226	13982-67-7	0.62	0.093		0.10		GAM
Thorium 228	14274-82-9	0.77	0.057				GAM
Thorium 232	7440-29-1	0.92	0.23				GAM

Lab id	TMAN
Protocol	WHC-HEIS
Version	Ver 1.0
Form	DVD-DS
Version	2.17
Report date	10/02/92

N209168-03

TMA NORCAL
REPORTING GROUP 7088

DATA SHEET

B01903

SDG	7088	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N209168-03	Client sample id	B01903
Dept sample id	7088-003	Matrix	SOIL
Received	09/21/92	Collected	09/17/92
		Chain of custody id	003023

PARAMETER	CAS NO	RESULT pCi/G	2σ ERR (COUNT)	MDA pCi/G	RDL pCi/G	QUALI-FIERS	TEST
GAMMA SCAN ANALYTES							
Potassium 40	13966-00-2	15	1.1				GAM
Iron 59		U		0.14	0.050	U	GAM
Chromium 51	14392-02-0	U		0.45		U	GAM
Cobalt 60	10198-40-0	U		0.042	0.050	U	GAM
Zinc 65	17982-39-3	U		0.12		U	GAM
Ruthenium 106	13967-48-1	U		0.45		U	GAM
Cesium 134	17967-70-9	U		0.059		U	GAM
Cesium 137	10045-97-3	0.041	0.039		0.050	J	GAM
Europium 152	14683-23-9	U		0.11	0.10	U	GAM
Europium 154	15585-10-1	U		0.071	0.10	U	GAM
Radium 226	13982-67-7	0.59	0.11		0.10		GAM
Thorium 228	14274-82-9	0.86	0.076				GAM
Thorium 232	7440-29-1	0.83	0.22				GAM

Lab id	TMAN
Protocol	WHC-HEIS
Version	Ver 1.0
Form	DVD-DS
Version	2.17
Report date	10/02/92

N209168-04

TMA NORCAL
REPORTING GROUP 7088

DATA SHEET

B01905

SDG	7088	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N209168-04	Client sample id	B01905
Dept sample id	7088-004	Matrix	SOIL
Received	09/21/92	Collected	09/17/92
		Chain of custody id	003023

PARAMETER	CAS NO	RESULT pCi/G	2σ ERR (COUNT)	MDA pCi/G	RDL pCi/G	QUALI-FIERS	TEST
GAMMA SCAN ANALYTES							
Potassium 40	13966-00-2	16	1.1				GAM
Iron 59		U		0.17	0.050	U	GAM
Chromium 51	14392-02-0	U		0.37		U	GAM
Cobalt 60	10198-40-0	U		0.051	0.050	U	GAM
Zinc 65	17982-39-3	U		0.13		U	GAM
Ruthenium 106	13967-48-1	U		0.38		U	GAM
Cesium 134	17967-70-9	U		0.036		U	GAM
Cesium 137	10045-97-3	0.092	0.053		0.050		GAM
Europium 152	14683-23-9	U		0.085	0.10	U	GAM
Europium 154	15585-10-1	U		0.062	0.10	U	GAM
Radium 226	13982-67-7	0.55	0.091		0.10		GAM
Thorium 228	14274-82-9	0.72	0.055				GAM
Thorium 232	7440-29-1	0.88	0.21				GAM

Lab id	TMAN
Protocol	WHC-HEIS
Version	Ver 1.0
Form	DVD-DS
Version	2.17
Report date	10/02/92

N209168-05

TMA NORCAL
REPORTING GROUP 7088

DATA SHEET

B01906

SDG 7088
Contact Dinkar Kharkar

Client Westinghouse Hanford
Contract MBH-SVV-069262

Lab sample id N209168-05
Dept sample id 7088-005
Received 09/21/92

Client sample id B01906
Matrix SOIL
Collected 09/17/92
Chain of custody id 003023

PARAMETER	CAS NO	RESULT pCi/G	2σ ERR (COUNT)	MDA pCi/G	RDL pCi/G	QUALI-FIERS	TEST
GAMMA SCAN ANALYTES							
Potassium 40	13966-00-2	13	1.1				GAM
Iron 59		U		0.16	0.050	U	GAM
Chromium 51	14392-02-0	U		0.38		U	GAM
Cobalt 60	10198-40-0	U		0.042	0.050	U	GAM
Zinc 65	17982-39-3	U		0.13		U	GAM
Ruthenium 106	13967-48-1	U		0.35		U	GAM
Cesium 134	17967-70-9	U		0.057		U	GAM
Cesium 137	10045-97-3	0.10	0.053		0.050		GAM
Europium 152	14683-23-9	U		0.10	0.10	U	GAM
Europium 154	15585-10-1	U		0.067	0.10	U	GAM
Radium 226	13982-67-7	0.58	0.097		0.10		GAM
Thorium 228	14274-82-9	0.79	0.060				GAM
Thorium 232	7440-29-1	0.83	0.20				GAM

Lab id TMAN
Protocol WHC-HEIS
Version Ver 1.0
Form DVD-DS
Version 2.17
Report date 10/02/92

N209168-06

TMA NORCAL
REPORTING GROUP 7088

DATA SHEET

B01907

SDG	7088	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N209168-06	Client sample id	B01907
Dept sample id	7088-006	Matrix	SOIL
Received	09/21/92	Collected	09/17/92
		Chain of custody id	003023

PARAMETER	CAS NO	RESULT pCi/G	2σ ERR (COUNT)	MDA pCi/G	RDL pCi/G	QUALI-FIERS	TEST
GAMMA SCAN ANALYTES							
Potassium 40	13966-00-2	13	1.0				GAM
Iron 59		U		0.14	0.050	U	GAM
Chromium 51	14392-02-0	U		0.36		U	GAM
Cobalt 60	10198-40-0	U		0.049	0.050	U	GAM
Zinc 65	17982-39-3	U		0.12		U	GAM
Ruthenium 106	13967-48-1	U		0.43		U	GAM
Cesium 134	17967-70-9	U		0.055		U	GAM
Cesium 137	10045-97-3	0.10	0.036		0.050		GAM
Europium 152	14683-23-9	U		0.084	0.10	U	GAM
Europium 154	15585-10-1	U		0.064	0.10	U	GAM
Radium 226	13982-67-7	0.60	0.088		0.10		GAM
Thorium 228	14274-82-9	0.84	0.058				GAM
Thorium 232	7440-29-1	1.1	0.21				GAM

Lab id	TMAN
Protocol	WHC-HEIS
Version	Ver 1.0
Form	DVD-DS
Version	2.17
Report date	10/02/92

Westinghouse Hanford Company	CHAIN OF CUSTODY	003023

Custody Form Initiator L.GUERRA / R. ARNOLD

Company Contact K.N. POOL/ C.E. HEIDEN Telephone 376-2640

Project Designation/Sampling Locations SAF#92-311 Collection Date 09-17-92

SODIUM DICHROMATE BARREL. LOCATION 100-IU-4

Ice Chest No. Field Logbook No. WHC-N -205-19

Bill of Lading/Airbill No. Offsite Property No.

Method of Shipment SAMPLE DOUBLE-BAGGED PLACED ON WET ICE. AIR FRIEGHT

Shipped to TMA / RICHMOND CA 94804

Possible Sample Hazards/Remarks UNKNOWN

SEE SAMPLES ANALYSIS REQUEST FOR INDIVIDUAL CONTAINERS AND ANALYSIS.

Sample Identification

B01901	(3)	BOTTLES
B01902	(3)	BOTTLES
B01903	(3)	BOTTLES
B01905	(3)	BOTTLES
B01906	(3)	BOTTLES
B01907	(3)	BOTTLES

9-18-92

9-18-92

☐ Field Transfer of Custody **CHAIN OF POSSESSION** (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
L. Guerra	Kermit Blum	9-21-92 0800 *
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time: 034
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments: * Received @ TMA/NORCAL 9-19-92 ; opened 9-21-92 - KB

A-6000-407 (12/90)

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST COC#03023

Collector L.GUERRA /R.ARNOLD Date 09/17/92

Company Contact K.N. POOL/ C.E. HEIDEN Telephone (509) 376-2640

Sample Number	*	Date Collected	Time Collected	Number and Type of Sample Containers/Analysis Requested	
B01901	S	9-17-92	10:00	(1) 250ml (G) Cr+6	(SW-846 7197)
				(1) 250ml (G) ICP/GFAA METALS	(CLP)
				(1) 1000ml (G) GAMMA SPEC.	(RC-30)
B01902			10:40	(1) 250ml (G) Cr+6	(SW-846 7197)
				(1) 250ml (G) ICP/GFAA METALS	(CLP)
				(1) 1000ml (G) GAMMA SPEC.	(RC-30)
B01903			10:40	(1) 250ml (G) Cr+6	(SW-846 7197)
				(1) 250ml (G) ICP/GFAA METALS	(CLP)
				(1) 1000ml (G) GAMMA SPEC.	(RC-30)
B01905			12:50	(1) 250ml (G) Cr+6	(SW-846 7179)
				(1) 250ml (G) ICP/GFAA METALS	(CLP)
				(1) 1000ml (G) GAMMA SPEC.	(RC-30)
B01906			13:05	(1) 250ml (G) Cr+6	(SW-846 7179)
				(1) 250ml (G) ICP/GFAA METALS	(CLP)
				(1) 1000ml (G) GAMMA SPEC.	(RC-30)
B01907			13:35	(1) 250ml (G) Cr+6	(SW-846 7179)
				(1) 250ml (G) ICP/GFAA METALS	(CLP)
				(1) 1000ml (G) GAMMA SPEC.	(RC-30)
BOTTLES		TOTAL	18		

*Type of Sample

A = Air	L = Liquid	SE = Sediment	T = Tissue	X = Other
DL = Drum Liquids	O = Oil	SL = Sludge	W = Water	
DS = Drum Solids	S = Soil	SO = Solid	WI = Wipe	

Field Information SAF# 92-311 SODIUM DICHROMATE BARREL. LOCATION 100-IU -4

035

Special Handling and/or Storage "Samples to be kept cooled to 4°C prior to analysis."

Possible Sample Hazards Non-Detectable with field instrutment.

9-17-92

A-6000-406 (06/91)

TMA/Skinner & Sherman Labs SAMPLE LOG-IN

WORKORDER 3209415 CLIENT HANFORD_NCR No. SAMPLES:

PROTCL CLP TURNARND 10 day Rush! 6 (Soil) (Water) (Specify Other)

COOLER TEMP: 4 oC, or NA

CUSTODIAN Bennett

CUSTODY SEAL: PRESENT/ABSENT/INTACT/NOT

SHIPER & # Fedex #5188038634

TAGS: PRESENT/ABSENT/NA/SEE COC

CHAIN OF CUSTODY: PRESENT/ABSENT/NA, # N/A

SDG/BATCH N/A

CLIENT CASE NZ-09-149

PO/CONTRACT# ↓

CONTACT Dolores Sanchez

COMMENTS: NONE

SAMPLE CONTAINERS-INTACT/BROKEN COMMENTS

CLIENT COMMENT? YES/NO

SAMPLE LABELS AGREE WITH CHAIN OF CUSTODY INFO? YES/NO (COMMENT)

CLIENT PAPERWORK AGREES WITH SAMPLES & COC? YES /NO (COMMENT)

SHIPMENT DATES 9/22/92

LIST ANY DATE WITH PAPERWORK/SHIPMENT PROBLEMS & SPECIFY THE PROBLEM:

N/A

	CLIENT ID	MATRIX	RECEIVED	PH*	TEST(S) & QC	HOLD TIME UP
1	B01901	soil	9/22/92	N/A	TCP/AA, Crt6	RUSH T/A
2	02	↓	↓	↓	↓	H.T not applicable
3	03					
4	05					
5	06					
6	07					
7						
8						
9						
10						
11						
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14						
15						
16						
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21						
22						
23						
24						
25						
26						
27						

COMPLETE 9/28/92

Samples are from site known to have Rad-Contamination: YES ✓ NO

Samples have detectable amounts of Radioactive Material: YES NO ✓

SUBCONTRACT: YES/NO TO: DATE:

REVIEWED

* EPA/CLP required Rev 1.6 PAGE: 016526

FEDERAL EXPRESS

QUESTIONS? CALL 800-238-5355 TOLL FREE.

AIRBILL PACKAGE TRACKING NUMBER 5188038634

22374 5188038634

RECIPIENT'S COPY

1 Date 9/19/92

From (Your Name) Please Print: SAMPLE CONTROL

Your Phone Number (Very Important): (510)235-2633

Company: I N A /NORCAL

Department/Floor No.:

Street Address: 2030 WRIGHT AVE

City: RICHMOND State: CA ZIP Required: 94804

2 To (Recipient's Name) Please Print: SAMPLE CONTROL

Recipient's Phone Number (Very Important): ( )

Company: SKINNER & SHERMAN

Department/Floor No.:

Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes.): 300 SECOND AVENUE

City: WALTHAM State: MA ZIP Required: 02254

YOUR INTERNAL BILLING REFERENCE INFORMATION (optional) (First 24 characters will appear on invoice.): 23206406

H IF HOLD FOR PICK-UP, Print FEDEX Address Here

Street Address

City State ZIP Required

3 PAYMENT 1 [✓] Bill Sender 2 [ ] Bill Recipient's FedEx Acct. No. 3 [ ] Bill 3rd Party FedEx Acct. No. 4 [ ] Bill Credit Card 5 [ ] Cash/Check

4 SERVICES (Check only one box)

Priority Overnight (Delivery by next business morning†)
- 11 [✓] YOUR PACKAGING
- 16 [ ] FEDEX LETTER*
- 12 [ ] FEDEX PAK*
- 13 [ ] FEDEX BOX
- 14 [ ] FEDEX TUBE

Standard Overnight (Delivery by next business afternoon. No Saturday delivery†)
- 51 [ ] YOUR PACKAGING
- 56 [ ] FEDEX LETTER*
- 52 [ ] FEDEX PAK*
- 53 [ ] FEDEX BOX
- 54 [ ] FEDEX TUBE

Economy Two-Day (Delivery by second business day †)
- 30 [ ] ECONOMY*

Government Overnight (Restricted for authorized users only)
- 46 [ ] GOVT LETTER
- 41 [ ] GOVT PACKAGE

Freight Service (for packages over 150 lbs.)
- 70 [ ] OVERNIGHT FREIGHT** (Confirmed reservation required)
- 80 [ ] TWO-DAY FREIGHT**

†Delivery commitment may be later in some areas. *Declared Value Limit $500. **Call for delivery schedule.

5 DELIVERY AND SPECIAL HANDLING (Check services required)
- 1 [ ] HOLD FOR PICK-UP (Fill in Box H)
- 2 [✓] DELIVER WEEKDAY
- 3 DELIVER SATURDAY (Extra charge) [ ] (Not available to all locations)
- 4 [ ] DANGEROUS GOODS (Extra charge)
- 5 [ ]
- 6 [ ] DRY ICE — Lbs.
- 7 [ ] OTHER SPECIAL SERVICE
- 8 [ ]
- 9 [ ] SATURDAY PICK-UP (Extra charge)
- 10 [ ]
- 11 [ ]
- 12 [ ] HOLIDAY DELIVERY (If offered) (Extra charge)

6 PACKAGES | WEIGHT In Pounds Only | YOUR DECLARED VALUE

Total | Total | Total

1 | 48

DIM SHIPMENT (Chargeable Weight) [ ] ____ lbs.

L x W x H

Received At: [✓] 1 Regular Stop [ ] 2 On-Call Stop [ ] 3 Drop Box [ ] 4 B.S.C. [ ] 5 Station

7 Release Signature

Emp. No.: Date:

[ ] Cash Received
[ ] Return Shipment
[ ] Third Party [ ] Chg. To Del. [ ] Chg. To Hold

Street Address

City State Zip

Received By: X

Date/Time Received: 9/22/92 10:00 FedEx Employee Number

Federal Express Use
- Base Charges
- Declared Value Charge
- Other 1
- Other 2
- Total Charges

REVISION DATE 2/92 PART #137204 FXEM 8/92 FORMAT #126

126

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PAGE 1 TMA/Norcal CHAIN OF CUSTODY ORD # N2-09-149

RCVD: 09/21/92 DUE: 10/21/92 09/21/92 14:53:44 KEEP: 01/19/93 DISP: S

DASH	SAMPLE IDENTIFICATION	STORED	TESTS for FRACTIONS with work in DEPT: SU and CATEGORY		
01A-S	B01901	SS_1 (2)	WH001	WH002	WH175
02A-S	B01902	SS_1 (2)	WH001	WH002	WH175
03A-S	B01903	SS_1 (2)	WH001	WH002	WH175
04A-S	B01905	SS_1 (2)	WH001	WH002	WH175
05A-S	B01906	SS_1 (2)	WH001	WH002	WH175
06A-S	B01907	SS_1 (2)	WH001	WH002	WH175
06B-S	B01907 MS	SS_1 (2)	WH001	WH002	WH175
06C-S	B01907 DUP	SS_1 (2)	WH001	WH002	WH175
06D-S	L C S	SS_1 (2)	WH001	WH002	WH175

RELEASED BY	DATE	TRANSFERRED TO	DATE	RECEIVED BY	DATE
ryamamoto	9-21-92	skizner	9-21-92	[illegible]	9/22/92