START 9713506.2031

B09M28-TMA-645
TMA
0045861

RECORD COPY

JAN 1994
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SDLA

WESTINGHOUSE HANFORD COMPANY

Results of Analyses For:

GENERAL CHEMISTRY
Case No. 11-077
(TMA/ARLI W.O. No. A3-11-077)

METALS & NITRATE/NITRITE
Case No. N3-11-105
(TMA/Skinner & Sherman W.O. Nos. S3-11-229,
S3-11-230 & S3-11-231)

January 10, 1994

NOV 1996
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EDMC

TMA Master Work Order N3-11-105

MS
7/23/96

GENERAL CHEMISTRY RESULTS

CASE NO. 11-077

Water Sample #:

B09M28

CASE NARRATIVE

The data from the Calibration Verification, run on November 20, 1993, was reprocessed on December 20, 1993. The calculated data was originally from a five point calibration forced through the zero point. The data has been reprocessed without forcing the calibration through the zero point.

No other problems were encountered during sample analysis. All QC results were acceptable.

Maureen Parrish 12-23-93

Maureen Parrish

9713506.2036

000009

TMA Inc. REPORT Work Order # A3-11-077

Received: 11/22/93

Results by Sample

SAMPLE ID B09M28 FRACTION 01A TEST CODE WCCLPL NAME Anions & Wet Chem.

Date & Time Collected 11/15/93 Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	4.7	mg/L	0.2
Fluoride	300.0	0.1	mg/L	0.1
Phosphate	300.0	<0.4	mg/L	0.4
Sulfate	300.0	31	mg/L	5
Nitrate Nitrogen	300.0	8.3	mg/L	1.0
Nitrite Nitrogen	300.0	<0.1	mg/L	0.1

FORM I

9713506.2034

TMA

Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.

QUALITY ENVIRONMENTAL SERVICES

JAN 1994
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Report for

TMA/Norcal

WORK ORDER #S311231

Scientific Services Since 1922

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.
300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200
1-800-4 LAB TEST FAX (617) 890-3883

MS
7/23/96

9713506.2035

 Skinner&Sherman REPORT Work Order # S3-11-231

Received: 11/23/93 Results by Sample

SAMPLE ID B09N28 SAMPLE # 01 FRACTIONS: A
Date & Time Collected 11/15/93 13:15:00 Category WATER

NO3NO2 1.87
mg N/L

SAMPLE ID B09N28D SAMPLE # 01 FRACTIONS: B
Date & Time Collected 11/15/93 13:15:00 Category WATER

NO3NO2 2.05
mg N/L

SAMPLE ID B09N28S SAMPLE # 01 FRACTIONS: C
Date & Time Collected 11/15/93 13:15:00 Category WATER

NO3NO2 4.22
mg N/L

SAMPLE ID LCSW SAMPLE # 02 FRACTIONS: A
Date & Time Collected not specified Category WATER

NO3NO2 1.99
mg N/L

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.

This report is rendered upon all of the following conditions: Skinner & Sherman Laboratories, Inc., retains ownership of this report until associated submitted invoice is satisfied. Expert witness services shall be available in conjunction with this report only if prior notification of this potential requirement was made and accepted, before the analysis. Client will be responsible for Skinner & Sherman costs and consulting fees if our services are required by subpoena or otherwise in legal proceedings. Total liability is limited to the invoice amount. The results listed refer only to tested samples and applicable parameters. Samples are not analyzed in accordance with New York State protocol unless indicated. Product endorsement is neither inferred nor implied. Skinner & Sherman Laboratories, Inc., will exercise due diligence but will not be responsible for lost or destroyed samples or evidence unless client makes appropriate insurance coverage arrangements. Samples are held for thirty days following issuance of report. Samples will be stored at client's expense, if authorized in writing.

300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200
1-800-4 LAB TEST FAX (617) 890-3883

TMA 9713506.2036
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

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RECORD COPY

January 7, 1994

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

Quality Control Narrative

Scope
One (1) water sample was submitted to TMA/Skinner & Sherman Laboratories, Inc. on November 23, 1993. The sample was analyzed for the USEPA CLP metals. The analysis was performed under TMA/Skinner and Sherman work order S311229.

Methodology
The sample was prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program Statement of Work ILM02.

Discussion
All quality control requirements were met for the samples with no exceptions.

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

Respectfully submitted,

TMA/SKINNER & SHERMAN LABORATORIES, INC.

Steven Provencal

Steven R. Provencal
Lead Chemist

MS
7/23/96

i

9713506.2037

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B09M28

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-11-10SSAS No.: SDG No.: B09M28

Matrix (soil/water): WATER Lab Sample ID: 11229-01S

Level (low/med): LOW Date Received: 11/23/93

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	15.0	B		P
7440-36-0	Antimony	12.9	U		P
7440-38-2	Arsenic	2.1	U		P
7440-39-3	Barium	40.7	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	1.3	U		P
7440-70-2	Calcium	44000			P
7440-47-3	Chromium	64.5			P
7440-48-4	Cobalt	2.6	U		P
7440-50-8	Copper	2.5	U		P
7439-89-6	Iron	24.8	B		P
7439-92-1	Lead	2.9	U		P
7439-95-4	Magnesium	7500			P
7439-96-5	Manganese	0.80	U		P
7439-97-6	Mercury	0.20	U		AV
7440-02-0	Nickel	3.4	U		P
7440-09-7	Potassium	2560	B		P
7782-49-2	Selenium	2.8	U		P
7440-22-4	Silver	2.6	U		P
7440-23-5	Sodium	13500			P
7440-28-0	Thallium	3.7	B		P
7440-62-2	Vanadium	5.5	U		P
7440-66-6	Zinc	10.8	B		P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

TMA 9713506.2038
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

RECORD COPY

JAN 1994
RECEIVED
SDLA

January 7, 1994

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

Quality Control Narrative

Scope
One (1) water sample was submitted to TMA/Skinner & Sherman Laboratories, Inc. on November 23, 1993. The sample was analyzed for the USEPA CLP metals. The analysis was performed under TMA/Skinner and Sherman work order S311230.

Methodology
The sample was prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program Statement of Work ILM02.

Discussion
All quality control requirements were met for the samples with no exceptions.

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

Respectfully submitted,

TMA/SKINNER & SHERMAN LABORATORIES, INC.

Steven Provencal

Steven R. Provencal
Lead Chemist

MS
1/23/96

i

9713506.2039

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

809M29

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-11-105SAS No.: SDG No.: 809M29

Matrix (soil/water): WATER Lab Sample ID: 11230-01S

Level (low/med): LOW Date Received: 11/23/93

% Solids: 0.0

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

CAS No	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	10.6	U		P
7440-36-0	Antimony	12.9	U		P
7440-38-2	Arsenic	2.1	U		P
7440-39-3	Barium	39.5	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	1.3	U		P
7440-70-2	Calcium	43500			P
7440-47-3	Chromium	64.2			P
7440-48-4	Cobalt	2.6	U		P
7440-50-8	Copper	2.5	U		P
7439-89-6	Iron	5.3	U		P
7439-92-1	Lead	2.9	U		P
7439-95-4	Magnesium	7360			P
7439-96-5	Manganese	0.80	U		P
7439-97-6	Mercury	0.20	U		AV
7440-02-0	Nickel	3.4	U		P
7440-09-7	Potassium	2520	B		P
7782-49-2	Selenium	2.8	U		P
7440-22-4	Silver	2.6	U		P
7440-23-5	Sodium	13200			P
7440-28-0	Thallium	1.6	U		P
7440-62-2	Vanadium	5.5	U		P
7440-66-6	Zinc	4.4	U		P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

9713506.2090

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

JAN 1994
RECEIVED
SDLA

January 24, 1994

Ref: TMA/Norcal N3-11-107-7302

Ms. Briana Colley
Westinghouse Hanford Company
345 Hills Street
Richland, WA 99352

Dear Ms. Colley:

Enclosed is the data report for the one water sample received November 18, 1993 from location 100-HR-3. Results are given for gross alpha, gross beta, tritium, carbon-14, strontium-90, technetium-99, and isotopic uranium.

The data package is paginated 1 through 270.

Please call if you have any questions concerning this data.

Sincerely,

D. P. Kharkar

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

DPK/ss

Enclosure: Data Package

TMA/Norcal

Report N3-11-107-7302
Sample Delivery Group 7302

Westinghouse Hanford Company
P.O. MBH-SVV-069262

Case Narrative

January 24, 1994

1.0 GENERAL

TMA/Norcal Sample Delivery Group 7302 is comprised of the one water sample from location 100-HR-3, delivered under Field Log Book #EFL-0057. Chain-of-Custody numbers were not provided.

One 4000 mL, one 1000 mL plastic bottle, and one 250 mL glass bottle containing each sample was received for analysis.

2.0 ANALYSIS NOTES

2.1 Gross Alpha Analyses

The recovery of gross alpha in the LCS is 75% which is outside the (80-120)% protocol limits but within the 3σ contract limit.

2.2 Gross Beta Analyses

No problems were encountered by the laboratory in the analyses.

2.3 Tritium Analyses

No problems were encountered by the laboratory in the analyses.

2.4 Carbon-14 Analyses

No problems were encountered by the laboratory in the analyses.

2.5 Strontium-90 Analyses

No problems were encountered by the laboratory in the analyses.

2.6 Technetium-99 Analyses

The reagent blank contained activity above the RDL which is probably due to molybdenum-99 contamination in the technetium tracer. This may have contributed to activity in the sample at the same level and affected the duplicate results.

2.7 Total Uranium Analyses

The MDA of the LCS is greater than the RDL. Given that this is an LCS containing activity two hundred and fifty times greater than the RDL the high MDA is of no particular concern.

9713506.2092

N311107-01

TMA NORCAL
REPORTING GROUP 7302

DATA SHEET

B09M28

SDG	7302	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N311107-01	Client sample id	B09M28
Dept sample id	7302-001	Location/Matrix	100-HR-3 LIQUID
Received	11/18/93	Collected	11/15/93
		Chain of custody id	EFL-0057

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Gross Alpha	Alpha	5.9	2.0	1	3		80A
Gross Beta	Beta	100	4.1	2	4		80B
Tritium	10028-17-8	800	160	200	400		H
Carbon 14	14762-75-5	33	28	50	100	U	C
Strontium 90	10098-97-2	14	0.53	0.2	2		Y
Technetium 99	14133-76-7	130	5.1	3	5		TC
Total Uranium (ug/L)	7440-61-1	7.7	1.5	0.03	0.1		U_T

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	01/24/94

9713506.2093

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator KD LEE/GG HAMILTON

Company Contact PH BUTCHER

Telephone (509) 376-5045

Project Designation/Sampling Locations 100-HR-3

Collection Date 11-15-93

Ice Chest No. 0 GW5058

Field Logbook No. EFL-0057

Bill of Lading/Airbill No. 2519010615

Offsite Property No. W94-0-0001-42

Method of Shipment EMERY

Shipped to TMA

Possible Sample Hazards/Remarks

Sample Identification

BO 9M28

1, 1L, P, WATER, CLP-METALS(HNO3 to pH<2) UNFILTERED
1, 500ml, G, WATER, ANIONS(F,Cl,SO4,PO4,NO2,NO3)
1, 500ml, P, WATER, NO2/NO3(H2SO4 pH<2)
1, 4L, P/G, WATER, TOTAL ALPHA/BETA, Sr-90, TOTAL URANIUM(HNO3 pH<2)
1, 250ml, Gs, WATER, TRITIUM, C-14
1, 1L, P/G, WATER, Tc-99(HCl pH<2)

BO 9M29

1, 1L, P, WATER, CLP-METALS(HNO3 to pH<2) FILTERED

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished By	Date	Time	Received By	Date	Time
LD Walker L.D. Walker	11/16/93	0831	AJ Simpson AJ SIMPSON	11/16/93	0832
AJ Simpson AJ SIMPSON	11/17/93	0738	[illegible] / H. NARCISO	11-18-93	12:30

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/92) WEF061

9713506.2094

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector K. Lee, G. Hamilton Date Sampled 11-15-93 Time 1315 hours

Company Contact P. H. Butcher Telephone (509) 376-5045

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
BØ9M28	1, 1L, P	WATER	CLP-METALS(HNO3 pH<2) UNFILTERED
	1, 500ml, G	WATER	ANIONS(F,Cl,SO4,PO4,NO2,NO3)
	1, 500ml, P	WATER	NO2/NO3(H2SO4 pH<2)
	1, 4L, P/G	WATER	TOT ALPHA/BETA,Sr-90,TOT U(HNO3 pH<2)
	1, 250ml, Gs	WATER	TRITIUM, C-14
	1, 1L, P/G	WATER	Tc-99(HCl pH<2)
BØ9M29	1, 1L, P	WATER	CLP-METALS(HNO3 pH<2) FILTERED
			OPC: ~~W93-~~ W94-0-0001-42 CCS 11-17-93
			BOL: 2519010101015
			TASK: 93-238

Field Information**

Special Handling and/or Storage

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by [signature] Title Sample Control Technician Date 11-18-93

Analysis Required

*Indicate whether sample is soil, sludge, water, etc.

**Use back of page for additional information relative to sample location.

A-6000-406(05/90)

FORM OF PAYMENT

Check ☐ GBL ☐ FCCOD ☐

Bill to Shipper ☒ Bill to Consignee ☐ Third Party Billing ☐

79

EMERY WORLDWIDE

A CF Company

SERVICES

UNITED STATES / CANADA: Same Day (Extra Charges) ☐ AM ☒ PM ☐ Second Day ☐ Saturday Delivery ☐

INTERNATIONAL: Express ☐ Standard Plus ☐ Preferred ☐ Standard ☐ Business Documents ☐ Customs Clearance ☐ Delivery ☐

PULL FOR SHPT. NO. TAB

E Shipper's Account Number: B502B1585

Date: 11-17-93 Origin: PBC Shipment Number: 251901061 5

From:
WESTINGHOUSE SHIPPING DEPT (509) 376-6665
U.S. DEPARTMENT OF ENERGY C/O
WESTINGHOUSE HANFORD
BLDG 1163
2355 STEVENS DRIVE
RICHLAND WA Canada ☐

To:
TMA/NORCAL
TMA/NORCAL
2030 WRIGHT AVENUE
RICHMOND CA USA Canada ☐

Hold for Pick Up ☐

Tariff Dest. Gateway

Check to Shipper $

EMERY WORLDWIDE will accept Consignee's check with all risks being assumed by Shipper, including but not limited to non-payment, fraud and misrepresentation.

Customer's Reference Numbers: W81232 PE3A1 W94-0-0001#42

Zip: 99352

E Consignee's Account Number: 94804

Description	Pcs.	L	W	H	Total Pieces	Total Weight (In Lbs.)
COOLER ID: GWS 058 WATER SAMPLES	1	24	16	17	1	50

FOR INFORMATION OR RATES CALL 1-800 44 EMERY (1-800-443-6379)

Declared Value $

2 5 1 9 0 1 0 6 1 5

Remarks: OVERNIGHT DELIVERY SIGNATURE SECURITY SERVICE

Shipper's Signature X

Zip Ship ☐ For shipments within the 50 United States Shipper has the option to check this box and, by checking, agrees that the Zip Ship conditions, described in the area to the right, apply.

Mark if Emery Packaging is used: Urgent Letter 9X12 ☒ Urgent Pack 12X15 ☒

International Shipments: Free Domicile ☐ Commodity Code

Third Party Account Number mandatory for Third Party Billing. E Third Party Account Number

International Customs Value

International Insurance

Base Charge

Total Transportation Charges

Other Charges/Advance at Origin ☐ OC/AO- $

1-OAK-A

Terms and Conditions on Back

CONSIGNEE — PACKAGE COPY — 4

9713506.2095

41

Overnight Delivery

Signature Security Service

Contractor WHC	OFF-SITE PROPERTY CONTROL	CONTROL NUMBER (To be obtained from PROPERTY MANAGEMENT) W9C-C-0001-42

PART I – TO BE COMPLETED BY ORIGINATOR

Department Env. Eng. & Tech.	Section Geosciences	Unit Geochem. & Hydrochem.

The following items are to be shipped from ☒ Contractor ☐ Vendor

Routing Emery ☒ Contractor ☐ Vendor

Shipped to TMA/NORCAL
2030 Wright Ave.
Richmond, CA 94804

Off-site Custodian

Full Title

Quantity	Description (Include Serial and any Government Tag Numbers)	Original Cost
1 lbs.	Sample #: 100N28, 300-29 Cooler ID: GW 5656 Polycooler with groundwater samples packed in wet ice and vermiculite	N/A
1 lbs.	Sample #: Cooler ID: 100 11-17-93 Polycooler with groundwater samples packed in wet ice and vermiculite	N/A

☐ Classified ☒ Unclassified ☐ Shipped Under DOE Contract ☐ Shipped Under Contractor's Use Permit Contract

Necessity for the Off-Site Use of this Property

Sampling supports RI/FS work in the 100 [illegible]

Bill of Lading # [illegible]

CERTIFICATION OF THE RADIATION MONITORING RELEASE MUST BE SECURED THE SAME DAY THAT MATERIAL IS DELIVERED TO SHIPPING.

RM Clearance for Public Release	RM Survey No.	Date

Location of Property (Area & Bldg.)	Contact	Phone
100-HR-3	PH Butcher	(509) 376-5045

Date Ready for Shipment	Cost Code to be Charged	Approximate Date This Property will be Returned
11-17-93	W81232/PC3A1	NA

Originated By	Date	Authorized By	Date
PH Butcher	11-17-93	[illegible]	11/17/93

Signature and Name of Property Control	Custodian Date	Property Management Approval	Date
		[illegible]	11/17/93

PART II – TO BE COMPLETED BY SHIPPING

Signature of Recipient	Return Order No.	Date Issued	Purchase Order No.	Date Issued
[illegible]	45		—	
Date 11/17/93				

DISTRIBUTION

By Originator	Shipping Operation – Sign all Copies and Forward to:
White, Green, Yellow, Pink – Property Management Goldenrod – Retain	White – Property Management Green – Property Control Custodian (Issuing Office) Yellow – Retain Pink – Originator

54-3000-479 (09/89)

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: Westinghouse Hanford		DATA PACKAGE: X02454	
VALIDATOR: RJS	LAB: TMA		DATE: 6.15.94
CASE: 100-HR-3		SDG: B09M28	

ANALYSES PERFORMED

☒ CLP/ICP	☒ CLP/GFAA	☒ CLP/Hg	☐ CLP/Cyanide	☐	☐
☐ SW-846/ICP	☐ SW-846/GFAA	☐ SW-846/Hg	☐ SW-846 Cyanide	☐	☐

SAMPLES/MATRIX B09M28 (WATER)

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . (Yes) No N/A

Is a case narrative present? . . . . . (Yes) No N/A

Comments:

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments: Hg [collected 11/15.93 RJ.
Analyzed 12/13.93 -28 days ✓

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

Were initial calibrations performed on all instruments? . . . . Yes No N/A
Are initial calibrations acceptable? . . . . . Yes No N/A
Are ICP interference checks acceptable? . . . . . Yes No N/A
Were ICV and CCV checks performed on all instruments? . . . . . Yes No N/A
Are ICV and CCV checks acceptable? . . . . . Yes No N/A
Comments:

4. BLANKS

Were ICB and CCB checks performed for all applicable analyses? Yes No N/A
Are ICB and CCB results acceptable? . . . . . Yes No N/A
Were preparation blanks analyzed? . . . . . Yes No N/A
Are preparation blank results acceptable? . . . . . Yes No N/A
Were field/trip blanks analyzed? . . . . . Yes No N/A
Are field/trip blank results acceptable? . . . . . Yes No N/A
Comments:

5. ACCURACY

Were spike samples analyzed? . . . . . Yes No N/A
Are spike sample recoveries acceptable? . . . . . Yes No N/A
Were laboratory control samples (LCS) analyzed? . . . . . Yes No N/A
Are LCS recoveries acceptable? . . . . . Yes No N/A
Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

6. PRECISION

Were laboratory duplicates analyzed? . . . . . Yes No N/A
Are laboratory duplicate samples RPD values acceptable? . . . . Yes No N/A
Were ICP serial dilution samples analyzed? . . . . . Yes No N/A
Are ICP serial dilution %D values acceptable? . . . . . Yes No N/A
Are field duplicate RPD values acceptable? . . . . . Yes No N/A
Are field split RPD values acceptable? . . . . . Yes No N/A

Comments:

7. FURNACE AA QUALITY CONTROL

Were duplicate injections performed as required? . . . . . Yes No N/A
Are duplicate injection %RSD values acceptable? . . . . . Yes No N/A
Were analytical spikes performed as required? . . . . . Yes No N/A
Are analytical spike recoveries acceptable? . . . . . Yes No N/A
Was MSA performed as required? . . . . . Yes No N/A
Are MSA results acceptable? . . . . . Yes No N/A

Comments:

8. REPORTED RESULTS AND DETECTION LIMITS

Are results reported for all requested analyses? . . . . . Yes No N/A
Are all results supported in the raw data? . . . . . Yes No N/A
Are results calculated properly? . . . . . Yes No N/A
Do results meet the CRDLs? . . . . . Yes No N/A

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

Comments (attach additional sheets as necessary):

9713506.2101

WESTINGHOUSE/HANFORD

1

WC

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B09M28

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-11-105SAS No.: SDG No.: B09M28

Matrix (soil/water): WATER Lab Sample ID: 11229-01S

Level (low/med): LOW Date Received: 11/23/93

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	15.0	Ø		P	U - cal., Prep blank
7440-36-0	Antimony	12.9	U		P	
7440-38-2	Arsenic	2.1	U		P	
7440-39-3	Barium	40.7	B		P	
7440-41-7	Beryllium	0.20	U		P	
7440-43-9	Cadmium	1.3	U		P	
7440-70-2	Calcium	44000			P	
7440-47-3	Chromium	64.5			P	
7440-48-4	Cobalt	2.6	U		P	
7440-50-8	Copper	2.5	U		P	
7439-89-6	Iron	24.8	Ø		P	U - cal., Prep blank
7439-92-1	Lead	2.9	U		P	
7439-95-4	Magnesium	7500			P	
7439-96-5	Manganese	0.80	U		P	UJ - neg. cal., neg. Prep)
7439-97-6	Mercury	0.20	U		AV	
7440-02-0	Nickel	3.4	U		P	
7440-09-7	Potassium	2560	B		P	
7782-49-2	Selenium	2.8	U		P	
7440-22-4	Silver	2.6	U		P	
7440-23-5	Sodium	13500			P	
7440-28-0	Thallium	3.7	B		P	
7440-62-2	Vanadium	5.5	U		P	
7440-66-6	Zinc	10.8	Ø		P	U - cal., Prep blank
	Cyanide				NR	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

6.15.94

FORM I - IN ILM02.1

02

9716506.2102

WESTINGHOUSE/HANFORD

SAMPLE NUMBER:

B09M28

INORGANIC ANALYSIS DATA SHEET

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-11-10SSAS No.: SDG No.: B09M28

Matrix (soil/water): WATER Lab Sample ID: 11229-01S

Level (low/med): LOW Date Received: 11/23/93

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	15.0	Ø		P	U
7440-36-0	Antimony	12.9	U		P	
7440-38-2	Arsenic	2.1	U		P	
7440-39-3	Barium	40.7	B		P	
7440-41-7	Beryllium	0.20	U		P	
7440-43-9	Cadmium	1.3	U		P	
7440-70-2	Calcium	44000			P	
7440-47-3	Chromium	64.5			P	
7440-48-4	Cobalt	2.6	U		P	
7440-50-8	Copper	2.5	U		P	
7439-89-6	Iron	24.8	Ø		P	U
7439-92-1	Lead	2.9	U		P	
7439-95-4	Magnesium	7500			P	
7439-96-5	Manganese	0.80	U		P	UJ
7439-97-6	Mercury	0.20	U		AV	
7440-02-0	Nickel	3.4	U		P	
7440-09-7	Potassium	2560	B		P	
7782-49-2	Selenium	2.8	U		P	
7440-22-4	Silver	2.6	U		P	
7440-23-5	Sodium	13500			P	
7440-28-0	Thallium	3.7	B		P	
7440-62-2	Vanadium	5.5	U		P	
7440-66-6	Zinc	10.8	Ø		P	U
	Cyanide				NR	

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

6-15-94

BLANK AND SAMPLE DATA SUMMARY

SDG: B09M28	VALIDATOR: RJS	DATE: 6·16·94	PAGE____OF____
COMMENTS:			

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
CCV 1	Aluminum	27.1			mg/L	135.5	271	B09M28	U
CCV1,	Iron	39.8				199	398	B09M28	U
Prep	Iron	20.0				100	200	B09M28	U
CCV 1	Manganese	-1.0				-5	-10	B09M28	UJ
Prep	Manganese	-1.6				-8	-16	B09M28	UJ
CCV 1	Zinc	8.7				43.5	87	B09M28	U
Prep	Zinc	4.5				22.5	45	B09M28	U

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DATA QUALIFICATION SUMMARY

SDG: B09M28	VALIDATOR: RJS	DATE: 6·16·94	PAGE____OF____
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Aluminum	U	B09M28	cal. blank
IRON	U	B09M28	cal., Prep blank
Manganese	UJ	B09M28	neg. cal., Prep. blanks
Zinc	U	B09M28	cal., Prep blank

9713506.2105

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

B09M28

INORGANIC ANALYSIS DATA SHEET

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-11-10SSAS No.: SDG No.: B09M28

Matrix (soil/water): WATER Lab Sample ID: 11229-01S

Level (low/med): LOW Date Received: 11/23/93

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q (LCB)	M
7429-90-5	Aluminum	15.0	~~B~~	U-cal+MB	P
7440-36-0	Antimony	12.9	U		P
7440-38-2	Arsenic	2.1	U		P
7440-39-3	Barium	40.7	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	1.3	U		P
7440-70-2	Calcium	44000			P
7440-47-3	Chromium	64.5			P
7440-48-4	Cobalt	2.6	U		P
7440-50-8	Copper	2.5	U		P
7439-89-6	Iron	24.8	~~B~~	U-cal+MB	P
7439-92-1	Lead	2.9	U		P
7439-95-4	Magnesium	7500			P
7439-96-5	Manganese	0.80	~~U~~	UJ-neg cal+MB	P(neg)
7439-97-6	Mercury	0.20	U		AV
7440-02-0	Nickel	3.4	U		P
7440-09-7	Potassium	2560	B		P
7782-49-2	Selenium	2.8	U		P
7440-22-4	Silver	2.6	U		P
7440-23-5	Sodium	13500			P
7440-28-0	Thallium	3.7	B		P
7440-62-2	Vanadium	5.5	U		P
7440-66-6	Zinc	10.8	~~B~~	U-cal+MB	P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN ILM02.1

9713506.2106

WESTINGHOUSE/HANFORD

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-11-105SAS No.: SDG No.: B09M28

Initial Calibration Source: EPA-LV

Continuing Calibration Source: SKINER

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum	2000.0	1932.20	96.6	25000.0	24447.00	97.8	23982.00	95.9	P
Antimony	600.0	578.62	96.4	2500.0	2409.50	96.4	2310.50	92.4	P
Arsenic	50.9	50.11	98.4	50.0	49.91	99.8	48.06	96.1	P
Barium	2000.0	1905.70	95.3	2500.0	2389.40	95.6	2332.60	93.3	P
Beryllium	50.0	45.00	90.0	500.0	496.64	99.3	487.03	97.4	P
Cadmium	50.0	47.84	95.7	2500.0	2370.20	94.8	2353.90	94.2	P
Calcium	50000.0	49226.00	98.5	25000.0	25112.00	100.4	25012.00	100.0	P
Chromium	100.0	95.97	96.0	2500.0	2418.40	96.7	2380.90	95.2	P
Cobalt	500.0	477.11	95.4	2500.0	2423.90	97.0	2382.00	95.3	P
Copper	250.0	225.50	90.2	2500.0	2430.30	97.2	2363.70	94.5	P
Iron	1000.0	907.48	90.7	10000.0	10028.00	100.3	9779.90	97.8	P
Lead	98.8	101.13	102.4	50.0	49.94	99.9	49.71	99.4	P
Magnesium	50000.0	49081.00	98.2	25000.0	24599.00	98.4	24135.00	96.5	P
Manganese	150.0	142.68	95.1	2500.0	2408.20	96.3	2378.70	95.1	P
Mercury	5.0	5.92	118.4	2.0	1.96	98.0	2.03	101.5	AV
Nickel	400.0	374.31	93.6	2500.0	2410.00	96.4	2366.20	94.6	P
Potassium	50000.0	48757.00	97.5	25000.0	24558.00	98.2	23807.00	95.2	P
Selenium	50.7	48.42	95.5	50.0	49.65	99.3	48.46	96.9	P
Silver	100.0	93.01	93.0	500.0	468.32	93.7	458.44	91.7	P
Sodium	50000.0	48758.00	97.5	25000.0	24536.00	98.1	23872.00	95.5	P
Thallium	98.9	100.31	101.4	50.0	53.34	106.7	51.31	102.6	P
Vanadium	500.0	483.96	96.8	2500.0	2432.00	97.3	2388.40	95.5	P
Zinc	200.0	195.06	97.5	2500.0	2412.80	96.5	2373.70	94.9	P
Cyanide									NR

(1) Control limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

03

9713506.2107

WESTINGHOUSE/HANFORD

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-02-0039

Lab Code: SKINER Case No.: N3-11-105SAS No.: SDG No.: 809M28

Initial Calibration Source: EPA-LV

Continuing Calibration Source: SKINER

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum				25000.0	24346.00	97.4	24372.00	97.5	P
Antimony				2500.0	2270.60	90.8	2254.10	90.2	P
Arsenic				50.0	47.43	94.9	48.99	98.0	P
Barium				2500.0	2363.10	94.5	2363.40	94.5	P
Beryllium				500.0	494.62	98.9	495.23	99.0	P
Cadmium				2500.0	2349.60	94.0	2422.80	96.9	P
Calcium				25000.0	25360.00	101.4	25507.00	102.0	P
Chromium				2500.0	2420.30	96.8	2425.00	97.0	P
Cobalt				2500.0	2425.10	97.0	2436.00	97.4	P
Copper				2500.0	2397.10	95.9	2395.00	95.8	P
Iron				10000.0	10133.00	101.3	10176.00	101.8	P
Lead				50.0	48.69	97.4	48.56	97.1	P
Magnesium				25000.0	24471.00	97.9	24498.00	98.0	P
Manganese				2500.0	2411.90	96.5	2406.30	96.3	P
Mercury									NR
Nickel				2500.0	2407.90	96.3	2416.40	96.7	P
Potassium				25000.0	24087.00	96.3	24236.00	96.9	P
Selenium				50.0	47.78	95.6	49.72	99.4	P
Silver				500.0	468.44	93.7	467.56	93.5	P
Sodium				25000.0	24199.00	96.8	24235.00	96.9	P
Thallium				50.0	50.92	101.8	49.54	99.1	P
Vanadium				2500.0	2423.40	96.9	2427.50	97.1	P
Zinc				2500.0	2297.10	91.9	2337.20	93.5	P
Cyanide									NR

(1) Control limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

04

WESTINGHOUSE/HANFORD

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-11-105SAS No.: SDG No.: 809M28

Initial Calibration Source: EPA-LV

Continuing Calibration Source: SKINER

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum				25000.0	23611.00	94.4			P
Antimony				2500.0	2469.70	98.8			P
Arsenic				50.0	48.42	96.8	50.63	101.3	P
Barium				2500.0	2464.70	98.6			P
Beryllium				500.0	500.00	100.0			P
Cadmium				2500.0	2458.30	98.3			P
Calcium				25000.0	24475.00	97.9			P
Chromium				2500.0	2460.50	98.4			P
Cobalt				2500.0	2451.10	98.0			P
Copper				2500.0	2500.70	100.0			P
Iron				10000.0	9685.10	96.9			P
Lead				50.0	49.14	98.3	49.43	98.9	P
Magnesium				25000.0	23705.00	94.8			P
Manganese				2500.0	2456.20	98.2			P
Mercury									NR
Nickel				2500.0	2440.00	97.6			P
Potassium				25000.0	23412.00	93.6			P
Selenium				50.0	49.12	98.2	48.39	96.8	P
Silver				500.0	453.36	90.7			P
Sodium				25000.0	23560.00	94.2			P
Thallium				50.0	50.25	100.5	50.90	101.8	P
Vanadium				2500.0	2470.50	98.8			P
Zinc				2500.0	2472.70	98.9			P
Cyanide									NR

(1) Control limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

05

WESTINGHOUSE/HANFORD

2A

INITIAL AND CONTINUING CALIBRATION VERIFICATION

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-11-10SSAS No.: SDG No.: 809M28

Initial Calibration Source: EPA-LV

Continuing Calibration Source: SKINER

Concentration Units: ug/L

Analyte	Initial Calibration True	Initial Calibration Found	Initial Calibration %R(1)	Continuing Calibration True	Continuing Calibration Found	Continuing Calibration %R(1)	Continuing Calibration Found	Continuing Calibration %R(1)	M
Aluminum									NR
Antimony									NR
Arsenic				50.0	47.61	95.2			P
Barium									NR
Beryllium									NR
Cadmium									NR
Calcium									NR
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead				50.0	49.01	98.0			P
Magnesium									NR
Manganese									NR
Mercury									NR
Nickel									NR
Potassium									NR
Selenium				50.0	49.85	99.7			P
Silver									NR
Sodium									NR
Thallium				50.0	51.45	102.9			P
Vanadium									NR
Zinc									NR
Cyanide									NR

(1) Control limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

06

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WESTINGHOUSE/HANFORD

28

CRDL STANDARD FOR AA AND ICP

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-11-105SAS No.: SDG No.: 809M28

AA CRDL Standard Source: CONTRACTOR

ICP CRDL Standard Source: SKINER

Concentration Units: ug/L

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
				Initial			Final	
	True	Found	%R	True	Found	%R	Found	%R
Aluminum								
Antimony				120.0	112.75	94.0	104.33	86.9
Arsenic				20.0	18.18	90.9	18.64	93.2
Barium								
Beryllium				10.0	9.07	90.7	9.37	93.7
Cadmium				10.0	11.70	117.0	10.63	106.3
Calcium								
Chromium				20.0	16.35	81.8	17.44	87.2
Cobalt				100.0	95.10	95.1	96.31	96.3
Copper				50.0	69.01	138.0	57.13	114.3
Iron								
Lead				6.0	6.99	116.5	6.92	115.3
Magnesium								
Manganese				30.0	26.12	87.1	26.28	87.6
Mercury								
Nickel				80.0	74.93	93.7	77.30	96.6
Potassium								
Selenium				10.0	9.16	91.6	9.65	96.5
Silver				20.0	18.10	90.5	18.41	92.0
Sodium								
Thallium				20.0	20.83	104.2	21.86	109.3
Vanadium				100.0	90.63	90.6	92.34	92.3
Zinc				40.0	42.03	105.1	45.52	113.8

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WESTINGHOUSE/HANFORD

3

BLANKS

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-11-105SAS No.: SDG No.: B09M28

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum	10.6	U	27.1	B	15.9	B	31.0	B	28.390	B	P
Antimony	12.9	U	12.9	U	12.9	U	17.9	B	12.900	U	P
Arsenic	2.1	U	2.1	U	2.1	U	2.1	U	2.100	U	P
Barium	1.2	U	1.2	B	1.2	B	1.7	B	1.380	B	P
Beryllium	0.2	U	0.2	U	0.2	U	0.2	B	0.200	U	P
Cadmium	1.3	U	1.7	B	1.7	B	2.8	B	1.300	U	P
Calcium	59.0	U	59.0	U	59.0	U	59.0	U	59.000	U	P
Chromium	2.1	U	2.1	U	2.1	U	2.1	U	2.100	U	P
Cobalt	2.6	U	4.0	B	2.6	U	2.6	U	3.220	B	P
Copper	22.8	B	11.6	B	5.4	B	6.1	B	5.440	B	P
Iron	-8.6	B	39.8	B	-5.5	B	76.7	B	23.030	B	P
Lead	2.9	U	2.9	U	2.9	U	2.9	U	2.900	U	P
Magnesium	22.9	U	65.0	B	22.9	U	22.9	U	52.370	B	P
Manganese	-1.9	B	-1.0	B	0.8	U	0.8	U	-1.590	B	P
Mercury	0.2	U	0.2	U	0.2	U			0.200	U	AV
Nickel	-4.4	B	3.4	U	3.4	U	3.4	U	3.400	U	P
Potassium	68.5	U	68.5	U	68.5	U	68.5	U	68.500	U	P
Selenium	2.8	U	2.8	U	2.8	U	2.8	U	2.800	U	P
Silver	2.6	U	2.6	U	2.6	U	2.6	U	2.600	U	P
Sodium	114.4	U	114.4	U	114.4	U	114.4	U	114.400	U	P
Thallium	2.8	B	1.6	B	1.6	U	2.0	B	1.600	U	P
Vanadium	5.5	U	5.5	U	5.5	U	5.5	U	5.500	U	P
Zinc	11.8	B	8.7	B	8.0	B	7.6	B	4.520	B	P
Cyanide											NR

ICP analysis

08

9713506.2112

WESTINGHOUSE/HANFORD

3

BLANKS

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-11-105SAS No.: SDG No.: B09M28

Preparation Blank Matrix (soil/water):

Preparation Blank Concentration Units (ug/L or mg/kg):

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum			33.3	B	21.8	B					P
Antimony			12.9	U	16.3	B					P
Arsenic			2.1	U	2.1	U	2.1	U			P
Barium			1.6	B	1.8	B					P
Beryllium			0.3	B	0.3	B					P
Cadmium			2.5	B	3.3	B					P
Calcium			59.0	U	59.0	U					P
Chromium			2.1	U	2.1	U					P
Cobalt			4.8	B	6.7	B					P
Copper			5.8	B	17.7	B					P
Iron			96.8	B	21.0	B					P
Lead			2.9	U	2.9	U	2.9	U			P
Magnesium			22.9	U	22.9	U					P
Manganese			0.8	U	0.8	U					P
Mercury											NR
Nickel			3.4	U	3.4	U					P
Potassium			68.5	U	68.5	U					P
Selenium			2.8	U	2.8	U	2.8	U			P
Silver			2.6	U	2.6	U					P
Sodium			114.4	U	114.4	U					P
Thallium			1.6	U	1.7	B	2.5	B			P
Vanadium			5.5	U	5.5	U					P
Zinc			10.1	B	12.2	B					P
Cyanide											NR

CCV 4 * AA ICP

08A

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WESTINGHOUSE/HANFORD

3
BLANKS

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-11-105SAS No.: SDG No.: B09M28

Preparation Blank Matrix (soil/water):

Preparation Blank Concentration Units (ug/L or mg/kg):

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum											NR
Antimony											NR
Arsenic			2.1	U							P
Barium											NR
Beryllium											NR
Cadmium											NR
Calcium											NR
Chromium											NR
Cobalt											NR
Copper											NR
Iron											NR
Lead			2.9	U							P
Magnesium											NR
Manganese											NR
Mercury											NR
Nickel											NR
Potassium											NR
Selenium			2.8	U							P
Silver											NR
Sodium											NR
Thallium			1.7	B							P
Vanadium											NR
Zinc											NR
Cyanide											NR

09

9713506.2114

WESTINGHOUSE/HANFORD

4

ICP INTERFERENCE CHECK SAMPLE

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-11-105SAS No.: SDG No.: B09M28

ICP ID Number: P2 ICS Source: SPEX INT-A1

Concentration Units: ug/L

Analyte	True Sol. A	True Sol. AB	Initial Found Sol. A	Initial Found Sol. AB	%R	Final Found Sol. A	Final Found Sol. AB	%R
Aluminum	500000	500000	489430	474200.0	94.8	477990	479480.0	95.9
Antimony	0	0	10	0.0		-2	4.8	
Arsenic								
Barium	0	500	-11	435.2	87.0	-10	441.1	88.2
Beryllium	0	500	0	418.3	83.7	0	422.7	84.5
Cadmium	0	1000	0	827.4	82.7	2	837.9	83.8
Calcium	500000	500000	480580	469080.0	93.8	479250	478470.0	95.7
Chromium	0	500	14	440.5	88.1	13	446.4	89.3
Cobalt	0	500	-2	411.8	82.4	-2	415.0	83.0
Copper	0	500	9	435.5	87.1	7	436.7	87.3
Iron	200000	200000	168180	163840.0	81.9	165440	165920.0	83.0
Lead								
Magnesium	500000	500000	501840	487760.0	97.6	493850	494620.0	98.9
Manganese	0	500	9	438.1	87.6	9	444.7	88.9
Mercury								
Nickel	0	1000	-9	804.2	80.4	-7	815.1	81.5
Potassium	0	0	36	27.4		-18	21.3	
Selenium								
Silver	0	1000	-4	1094.0	109.4	-5	1109.5	111.0
Sodium	0	0	454	300.2		455	303.0	
Thallium								
Vanadium	0	500	5	448.8	89.8	4	454.0	90.8
Zinc	0	1000	37	902.2	90.2	34	895.9	89.6

9713506.2115

WESTINGHOUSE/HANFORD

4

ICP INTERFERENCE CHECK SAMPLE

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-11-105SAS No.: SDG No.: B09M28

ICP ID Number: P0 ICS Source: ICF-0292

Concentration Units: ug/L

Analyte	True Sol. A	True Sol. AB	Initial Found Sol. A	Initial Found Sol. AB	Initial Found %R	Final Found Sol. A	Final Found Sol. AB	Final Found %R
Aluminum								
Antimony								
Arsenic	0	0	0	7.0		1	3.9	
Barium								
Beryllium								
Cadmium								
Calcium								
Chromium								
Cobalt								
Copper								
Iron								
Lead	0	4712	2	4099.7	87.0	1	4063.8	86.2
Magnesium								
Manganese								
Mercury								
Nickel								
Potassium								
Selenium	0	0	-1	-0.8		-2	-1.1	
Silver								
Sodium								
Thallium	0	0	-4	-1.0		-5	-2.7	
Vanadium								
Zinc								

9713506.2116

WESTINGHOUSE/HANFORD

5A

SPIKE SAMPLE RECOVERY

SAMPLE NUMBER: 809M28S

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-11-105SAS No.: SDG No.: 809M28

Matrix (soil/water): WATER Level (low/med): LOW

% Solids for Sample: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum	75-125	1987.2000		14.9500	B	2000.00	98.6		P
Antimony	75-125	464.1800		12.9000	U	500.00	92.8		P
Arsenic	75-125	1978.0000		2.1000	U	2000.00	98.9		P
Barium	75-125	1930.6000		40.6900	B	2000.00	94.5		P
Beryllium	75-125	48.0100		0.2000	U	50.00	96.0		P
Cadmium	75-125	48.2700		1.3000	U	50.00	96.5		P
Calcium									NR
Chromium	75-125	253.3600		64.5100		200.00	94.4		P
Cobalt	75-125	472.2500		2.6000	U	500.00	94.4		P
Copper	75-125	239.8100		2.5000	U	250.00	95.9		P
Iron	75-125	1020.1000		24.8300	B	1000.00	99.5		P
Lead	75-125	471.8100		2.9000	U	500.00	94.4		P
Magnesium									NR
Manganese	75-125	472.0600		0.8000	U	500.00	94.4		P
Mercury	75-125	1.0770		0.2000	U	1.00	107.7		AV
Nickel	75-125	475.0100		3.4000	U	500.00	95.0		P
Potassium									NR
Selenium	75-125	2001.9000		2.8000	U	2000.00	100.1		P
Silver	75-125	46.5000		2.6000	U	50.00	93.0		P
Sodium									NR
Thallium	75-125	1894.8000		3.7208	B	2000.00	94.6		P
Vanadium	75-125	478.7900		5.5000	U	500.00	95.8		P
Zinc	75-125	479.8800		10.8000	B	500.00	93.8		P
Cyanide									NR

Comments:

6

DUPLICATES

SAMPLE NUMBER:

809M28D

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-11-10SSAS No.: SDG No.: 809M28

Matrix (soil/water): WATER Level (low/med): LOW

% Solids for Sample: 0.0 % Solids for Duplicate: 0.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum		14.9500	B	28.5100	B	62.4		P
Antimony		12.9000	U	12.9000	U			P
Arsenic		2.1000	U	2.1000	U			P
Barium		40.6900	B	40.5200	B	0.4		P
Beryllium		0.2000	U	0.2000	U			P
Cadmium		1.3000	U	1.3000	U			P
Calcium		44027.0000		44973.0000		2.1		P
Chromium		64.5100		68.5200		6.0		P
Cobalt		2.6000	U	2.6000	U			P
Copper		2.5000	U	2.5000	U			P
Iron		24.8300	B	7.1900	B	110.2		P
Lead		2.9000	U	2.9000	U			P
Magnesium	5000.0	7498.8000		7628.1000		1.7		P
Manganese		0.8000	U	0.8000	U			P
Mercury		0.2000	U	0.2000	U			AV
Nickel		3.4000	U	3.4000	U			P
Potassium		2555.8000	B	2634.8000	B	3.0		P
Selenium		2.8000	U	2.8000	U			P
Silver		2.6000	U	2.6000	U			P
Sodium	5000.0	13524.0000		13669.0000		1.1		P
Thallium		3.7208	B	1.6000	U	200.0		P
Vanadium		5.5000	U	5.5000	U			P
Zinc		10.8000	B	4.4000	U	200.0		P
Cyanide								NR

13

7

LABORATORY CONTROL SAMPLE

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-11-105SAS No.: SDG No.: B09M28

Solid LCS Source:

Aqueous LCS Source: SPEX ICV-1

Analyte	Aqueous (ug/L) True	Aqueous (ug/L) Found	Aqueous (ug/L) %R	Solid (mg/kg) True	Solid (mg/kg) Found	C	Limits		%R
Aluminum	2000.0	1908.20	95.4						
Antimony	600.0	543.35	90.6						
Arsenic	50.0	48.56	97.1						
Barium	2000.0	1852.00	92.6						
Beryllium	50.0	44.57	89.1						
Cadmium	50.0	45.92	91.8						
Calcium	50000.0	47264.00	94.5						
Chromium	100.0	93.06	93.1						
Cobalt	500.0	452.93	90.6						
Copper	250.0	237.73	95.1						
Iron	1000.0	901.34	90.1						
Lead	25.0	25.38	101.5						
Magnesium	50000.0	46569.00	93.1						
Manganese	150.0	137.11	91.4						
Mercury									
Nickel	400.0	357.36	89.3						
Potassium	50000.0	46551.00	93.1						
Selenium	50.0	45.80	91.6						
Silver	100.0	85.49	85.5						
Sodium	50000.0	46832.00	93.7						
Thallium	50.0	50.70	101.4						
Vanadium	500.0	466.52	93.3						
Zinc	200.0	191.28	95.6						
Cyanide									

9713506.2119

WESTINGHOUSE/HANFORD

8

STANDARD ADDITION RESULTS

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-11-105SAS No.: SDG No.: B09M28

Concentration Units: ug/L

EPA Sample No.	An	0 ADD ABS	1 ADD CON	1 ADD ABS	2 ADD CON	2 ADD ABS	3 ADD CON	3 ADD ABS	Final Conc.	r	Q

FORM VIII - IN ILM02.1

9713506.2120

WESTINGHOUSE/HANFORD

9

SAMPLE NUMBER:

809M28L

ICP SERIAL DILUTIONS

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-11-105SAS No.: SDG No.: 809M28

Matrix (soil/water): WATER Level (low/med): LOW

Concentration Units: ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Aluminum	14.95	B	94.00	B	528.8		P
Antimony	12.90	U	64.50	U			P
Arsenic	2.10	U	10.50	U			P
Barium	40.69	B	51.95	B	27.7		P
Beryllium	0.20	U	1.00	U			P
Cadmium	1.30	U	7.35	B			P
Calcium	>50 44027.00		42785.50		2.8		P
Chromium	64.51		61.90		4.0		P
Cobalt	2.60	U	14.05	B			P
Copper	2.50	U	51.05	B			P
Iron	24.83	B	497.85	B	1905		P
Lead	2.90	U	14.50	U			P
Magnesium	>50 7498.80		7389.00	B	1.5		P
Manganese	0.80	U	4.00	U			P
Mercury							NR
Nickel	3.40	U	17.00	U			P
Potassium	>50! 2555.80	B	2537.50	B	0.7		P
Selenium	2.80	U	14.00	U			P
Silver	2.60	U	13.05	B			P
Sodium	>50 13524.00		12894.50	B	4.7		P
Thallium	3.72	B	22.50	B	504.8		P
Vanadium	5.50	U	150.60	B			P
Zinc	10.80	B	214.05		1882		P

WESTINGHOUSE/HANFORD

10

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-11-10SSAS No.: SDG No.: 809M28

ICP ID Number: Date: 10/15/93

Flame AA ID Number: M1

Furnace AA ID Number:

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		NR
Antimony			60		NR
Arsenic			10		NR
Barium			200		NR
Beryllium			5		NR
Cadmium			5		NR
Calcium			5000		NR
Chromium			10		NR
Cobalt			50		NR
Copper			25		NR
Iron			100		NR
Lead			3		NR
Magnesium			5000		NR
Manganese			15		NR
Mercury	253.70		0.2	0.2	AV
Nickel			40		NR
Potassium			5000		NR
Selenium			5		NR
Silver			10		NR
Sodium			5000		NR
Thallium			10		NR
Vanadium			50		NR
Zinc			20		NR

Comments:

M1: TECHNICON MERCURY ANALYZER (#SS4199A-D)

9713506.2122

WESTINGHOUSE/HANFORD

10

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-11-105SAS No.: SDG No.: 809M28

ICP ID Number: P0 Date: 10/15/93

Flame AA ID Number:

Furnace AA ID Number:

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		NR
Antimony			60		NR
Arsenic	189.00		10	2.1	P
Barium			200		NR
Beryllium			5		NR
Cadmium			5		NR
Calcium			5000		NR
Chromium			10		NR
Cobalt			50		NR
Copper			25		NR
Iron			100		NR
Lead	220.30		3	2.9	P
Magnesium			5000		NR
Manganese			15		NR
Mercury			0.2		NR
Nickel			40		NR
Potassium			5000		NR
Selenium	196.00		5	2.8	P
Silver			10		NR
Sodium			5000		NR
Thallium	190.80		10	1.6	P
Vanadium			50		NR
Zinc			20		NR

Comments:

P0: THERMO JARRELL-ASH ICAP61E (#171390)

9713506.2123

WESTINGHOUSE/HANFORD

10

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-11-105SAS No.: SDG No.: B09M28

ICP ID Number: P2 Date: 10/15/93

Flame AA ID Number:

Furnace AA ID Number:

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum	308.20		200	10.6	P
Antimony	206.80		60	12.9	P
Arsenic			10		NR
Barium	493.40		200	1.2	P
Beryllium	313.00		5	0.2	P
Cadmium	226.50		5	1.3	P
Calcium	317.90		5000	59.0	P
Chromium	267.70		10	2.1	P
Cobalt	228.60		50	2.6	P
Copper	324.70		25	2.5	P
Iron	259.90		100	5.3	P
Lead			3		NR
Magnesium	279.00		5000	22.9	P
Manganese	257.60		15	0.8	P
Mercury			0.2		NR
Nickel	231.60		40	3.4	P
Potassium	766.40		5000	68.5	P
Selenium			5		NR
Silver	328.00		10	2.6	P
Sodium	588.90		5000	114.4	P
Thallium			10		NR
Vanadium	292.40		50	5.5	P
Zinc	213.80		20	4.4	P

Comments:

P2: THERMO JARRELL-ASH ICAP61 (#22982)

9713506.2124

N311107-01

TMA NORCAL
REPORTING GROUP 7302

DATA SHEET

B09M28

SDG	7302	Client	Westinghouse Hanford
Contact	Dinkar Kharkar	Contract	MBH-SVV-069262
Lab sample id	N311107-01	Client sample id	B09M28
Dept sample id	7302-001	Location/Matrix	100-HR-3 LIQUID
Received	11/18/93	Collected	11/15/93
		Chain of custody id	EFL-0057

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI-FIERS	TEST
Gross Alpha	Alpha	5.9	2.0	1	3		80A
Gross Beta	Beta	100	4.1	2	4		80B
Tritium	10028-17-8	800	160	200	400		H
Carbon 14	14762-75-5	33	28	50	100	U	C
Strontium 90	10098-97-2	14	0.53	0.2	2		Y
Technetium 99	14133-76-7	130	5.1	3	5		TC
Total Uranium (ug/L)	7440-61-1	7.7	1.5	0.03	0.1		U_T

NV

RJS 6-17-94

Lab id	TMAN
Protocol	WHC-HASM
Version	Ver 1.0
Form	DVD-DS
Version	2.28
Report date	01/24/94

DATA SHEETS
Page 1
SUMMARY DATA SECTION
Page 12

9713506.2125

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

B09M28

INORGANIC ANALYSIS DATA SHEET

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-11-105SAS No.: SDG No.: B09M28

Matrix (soil/water): WATER Lab Sample ID: 11229-01S

Level (low/med): LOW Date Received: 11/23/93

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	15.0	B		P
7440-36-0	Antimony	12.9	U		P
7440-38-2	Arsenic	2.1	U		P
7440-39-3	Barium	40.7	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	1.3	U		P
7440-70-2	Calcium	44000			P
7440-47-3	Chromium	64.5			P
7440-48-4	Cobalt	2.6	U		P
7440-50-8	Copper	2.5	U		P
7439-89-6	Iron	24.8	B		P
7439-92-1	Lead	2.9	U		P
7439-95-4	Magnesium	7500			P
7439-96-5	Manganese	0.80	U		P
7439-97-6	Mercury	0.20	U		AV
7440-02-0	Nickel	3.4	U		P
7440-09-7	Potassium	2560	B		P
7782-49-2	Selenium	2.8	U		P
7440-22-4	Silver	2.6	U		P
7440-23-5	Sodium	13500			P
7440-28-0	Thallium	3.7	B		P
7440-62-2	Vanadium	5.5	U		P
7440-66-6	Zinc	10.8	B		P
	Cyanide				NR

NV
6/20/94 SC

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN ILM02.1

02

9713506.2126

WESTINGHOUSE/HANFORD

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B09M29

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: N3-11-10SSAS No.: SDG No.: B09M29

Matrix (soil/water): WATER Lab Sample ID: 11230-01S

Level (low/med): LOW Date Received: 11/23/93

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	10.6	U		P
7440-36-0	Antimony	12.9	U		P
7440-38-2	Arsenic	2.1	U		P
7440-39-3	Barium	39.5	B		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	1.3	U		P
7440-70-2	Calcium	43500			P
7440-47-3	Chromium	64.2			P
7440-48-4	Cobalt	2.6	U		P
7440-50-8	Copper	2.5	U		P
7439-89-6	Iron	5.3	U		P
7439-92-1	Lead	2.9	U		P
7439-95-4	Magnesium	7360			P
7439-96-5	Manganese	0.80	U		P
7439-97-6	Mercury	0.20	U		AV
7440-02-0	Nickel	3.4	U		P
7440-09-7	Potassium	2520	B		P
7782-49-2	Selenium	2.8	U		P
7440-22-4	Silver	2.6	U		P
7440-23-5	Sodium	13200			P
7440-28-0	Thallium	1.6	U		P
7440-62-2	Vanadium	5.5	U		P
7440-66-6	Zinc	4.4	U		P
	Cyanide				NR

NV 6/20/94 8

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN ILM02.1

002

9715506.2127

000009

TMA Inc. REPORT Work Order # A3-11-077

Received: 11/22/93

Results by Sample

SAMPLE ID B09M28 FRACTION 01A TEST CODE WCCLPL NAME Anions & Wet Chem.

Date & Time Collected 11/15/93 Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	4.7	mg/L	0.2
Fluoride	300.0	0.1	mg/L	0.1
Phosphate	300.0	<0.4	mg/L	0.4
Sulfate	300.0	31	mg/L	5
Nitrate Nitrogen	300.0	8.3	mg/L	1.0
Nitrite Nitrogen	300.0	<0.1	mg/L	0.1

FORM I

NV 6/20/94 SC

TMA Inc. REPORT Work Order # A3-11-077

Received: 11/22/93

Results by Sample

SAMPLE ID Lab Blank FRACTION 02A TEST CODE WCCLPL NAME Anions & Wet Chem.

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Chloride	300.0	<0.2	mg/L	0.2
Fluoride	300.0	<0.1	mg/L	0.1
Phosphate	300.0	<0.4	mg/L	0.4
Sulfate	300.0	<1	mg/L	1
Nitrate Nitrogen	300.0	<0.2	mg/L	0.2
Nitrite Nitrogen	300.0	<0.1	mg/L	0.1

FORM I

9713506.2129

 Skinner&Sherman REPORT Work Order # S3-11-231

Received: 11/23/93 Results by Sample

SAMPLE ID B09M28 SAMPLE # 01 FRACTIONS: A
Date & Time Collected 11/15/93 13:15:00 Category WATER

NO3NO2 1.87
mg N/L

SAMPLE ID B09M28D SAMPLE # 01 FRACTIONS: B
Date & Time Collected 11/15/93 13:15:00 Category WATER

NO3NO2 2.05
mg N/L

SAMPLE ID B09M28S SAMPLE # 01 FRACTIONS: C
Date & Time Collected 11/15/93 13:15:00 Category WATER

NO3NO2 4.22
mg N/L

SAMPLE ID LCSW SAMPLE # 02 FRACTIONS: A
Date & Time Collected not specified Category WATER

NO3NO2 1.99
mg N/L

NV
6/20/94 SC