

**SAF-RC-029**  
**Remaining Sites Confirmation Sampling -**  
**Soil**  
**FINAL DATA PACKAGE**

COMPLETE COPY OF DATA PACKAGE TO:

Kathy Wendt

H4-21

KW 11/20/08  
INITIAL/DATE

COMMENTS:

**SDG P142040**

**SAF RC-029**

Rad only

Chem only

Rad & Chem

Complete

Partial

**Waste Site: 100-H-28:6**

**RECEIVED**  
DEC 16 2008  
**EDMC**

**Interoffice Memorandum**

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TO: Document Control H4-11

DATE: November 18, 2008

COPIES: See Below

FROM: M. W. Perrott  
H4-23/372-9088

SUBJECT: **100-H-28:6 SPLIT DATA**

Attached are 11 pages received from the Washington State Department of Ecology (Ecology) on November 13, 2008. Only selected pages of the original report were delivered to WCH by Ecology. The original report from Paragon Analytics, dated September 25, 2008, is Paragon work order 08-09-034.

MWP:lrs

Attachment: 100-H-28:6 Split Data

Copies: w/a

J. R. Davidson H4-23

M. W. Perrott H4-23

M. L. Proctor H4-22

L. R. Shelp H4-22

K. M. Wendt H4-21

Records and Document Control H4-11



A Division of DataChem Laboratories, Inc.

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11/13/08  
provided by  
MWF/jack

RECEIVED

OCT 06 2008

Department of Ecology  
NWP - Richland

COPY FOR YOUR INFORMATION

to WCH!

October 3, 2008

Ms. Noel Smith-Jackson  
Washington State Dept. of Ecology  
3100 Port of Benton Blvd.  
Richland WA 99352

Central Files \_\_\_\_\_  
File Name: \_\_\_\_\_  
Cross Reference: \_\_\_\_\_

Re: Paragon Workorder: 08-09-034  
Client Project Name: 182 Reservoir Sump Drains  
Client Project Number: 100-H-28:6

Dear Ms. Smith-Jackson:

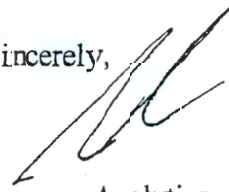
One soil sample was received from Washington State Dept. of Ecology on September 5, 2008. The sample was scheduled for the following analyses:

PCBs	pages 1-94	Gross Alpha/Beta	pages 1-156
Metals	pages 1-270	Gamma Spectroscopy	pages 1-108
Inorganics	pages 1-28		

The results for these analyses are contained in the enclosed reports.

Thank you for your confidence in Paragon Analytics. Should you have any questions, please call.

Sincerely,

  
Paragon Analytics  
Lance Steere  
Senior Project Manager

LRS/eh  
Enclosure (s): Report

# Paragon Analytics

## Sample Number(s) Cross-Reference Table

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**Paragon OrderNum:** 0809034

**Client Name:** Washington State Dept. of Ecology

**Client Project Name:** 182 Reservoir Sump Drains

**Client Project Number:** 100-H-28:6

**Client PO Number:** C9700008

---

Client Sample Number	Lab Sample Number	COC Number	Matrix	Date Collected	Time Collected
Ecology-J17FY8	0809034-1		SOIL	03-Sep-08	9:40

**PCBs**  
**Method SW8082**  
**Sample Results**

Lab Name: Paragon Analytics  
 Work Order Number: 0809034  
 Client Name: Washington State Dept. of Ecology  
 ClientProject ID: 182 Reservoir Sump Drains 100-H-28:6

Field ID: Ecology-J17FY8  
 Lab ID: 0809034-1

Sample Matrix: SOIL  
 % Moisture: 3.3  
 Date Collected: 03-Sep-08  
 Date Extracted: 12-Sep-08  
 Date Analyzed: 26-Sep-08  
 Prep Method: SW3540 Rev C

Prep Batch: EX080912-3  
 QCBatchID: EX080912-3-1  
 Run ID: PT080925-1  
 Cleanup: SW3665  
 Basis: Dry Weight  
 File Name: 01756.dat

Sample Aliquot: 30.7g  
 Final Volume: 10 ml  
 Result Units: UG/KG  
 Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
12674-11-2	AROCLOR-1016	1	34	34	U	
11104-28-2	AROCLOR-1221	1	67	67	U	
11141-16-5	AROCLOR-1232	1	34	34	U	
53469-21-9	AROCLOR-1242	1	34	34	U	
12672-29-6	AROCLOR-1248	1	34	34	U	
11097-69-1	AROCLOR-1254	1	34	34	U	
11096-82-5	AROCLOR-1260	1	34	34	U	

**Surrogate Recovery**

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
2051-24-3	DECACHLOROBIPHENYL	16.2		16.8	96	60 - 125
877-09-8	TETRACHLORO-M-XYLENE	16.6		16.8	99	70 - 125

Data Package ID: PT0809034-1



# Total ICP Metals

Method SW6010B

## Sample Results

Lab Name: Paragon Analytics

Work Order Number: 0809034

Client Name: Washington State Dept. of Ecology

ClientProject ID: 182 Reservoir Sump Drains 100-H-28:6

Field ID: Ecology-J17FY8

Lab ID: 0809034-1

Sample Matrix: SOIL

% Moisture: 3.3

Date Collected: 03-Sep-08

Date Extracted: 19-Sep-08

Date Analyzed: 22-Sep-08

Prep Method: SW3050 Rev B

Prep Batch: IP080919-3

QC Batch ID: IP080919-3-2

Run ID: IT080922-2A1

Cleanup: NONE

Basis: Dry Weight

File Name: 080922A.

Sample Aliquot: 1.01 g

Final Volume: 100 ml

Result Units: MG/KG

Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	7200	20		
7440-36-0	ANTIMONY	1	2	2	U	N
7440-38-2	ARSENIC	1	2.5	1		
7440-39-3	BARIUM	1	74	10		
7440-41-7	BERYLLIUM	1	0.51	0.51	U	
7440-43-9	CADMIUM	1	0.51	0.51	U	
7440-70-2	CALCIUM	1	6000	100		N
7440-47-3	CHROMIUM	1	13	1		
7440-48-4	COBALT	2	7.2	2		
7440-50-8	COPPER	1	14	1		
7439-89-6	IRON	2	19000	20		
7439-92-1	LEAD	2	6.8	0.61		E
7439-95-4	MAGNESIUM	1	5000	100		
7439-96-5	MANGANESE	1	240	1		
7440-02-0	NICKEL	1	15	2		
7440-09-7	POTASSIUM	1	970	100		
7782-49-2	SELENIUM	2	1	1	U	
7440-22-4	SILVER	1	1	1	U	
7440-23-5	SODIUM	1	210	100		
7440-28-0	THALLIUM	2	2	2	U	
7440-62-2	VANADIUM	2	41	2		
7440-66-6	ZINC	1	41	2		

Data Package ID: IT0809034-1

Date Printed: Wednesday, October 01, 2008

Paragon Analytics

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LIMS Version: 6.196A

# Total Mercury

Method SW7471A

Sample Results

Lab Name: Paragon Analytics

Work Order Number: 0809034

Client Name: Washington State Dept. of Ecology

ClientProject ID: 182 Reservoir Sump Drains 100-H-28:8

Field ID: Ecology-J17FY8  
Lab ID: 0809034-1

Sample Matrix: SOIL  
% Moisture: 3.3  
Date Collected: 03-Sep-08  
Date Extracted: 17-Sep-08  
Date Analyzed: 17-Sep-08  
Prep Method: METHOD

Prep Batch: HG080917-1  
QCBatchID: HG080917-1-1  
Run ID: HG080917-1A1  
Cleanup: NONE  
Basis: Dry Weight  
File Name: 08091701

Sample Aliquot: 0.602 g  
Final Volume: 100 g  
Result Units: MG/KG  
Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7439-97-6	MERCURY	1	0.034	0.034	U	

Data Package ID: HG0809034-1

Date Printed: Wednesday, October 01, 2008

Paragon Analytics  
LIMS Version: 6.196A

Page 1 of 1

# Hexavalent Chromium

Method SW7196A

## Sample Results

Lab Name: Paragon Analytics

Work Order Number: 0809034

Client Name: Washington State Dept. of Ecology

ClientProject ID: 182 Reservoir Sump Drains 100-H-28:6

Field ID: Ecology-J17FY8

Lab ID: 0809034-1

Sample Matrix: SOIL

% Moisture: 3.3

Date Collected: 03-Sep-08

Date Extracted: 25-Sep-08

Date Analyzed: 29-Sep-08

Prep Method: SW3080

Prep Batch: CR080925-2

QCBatchID: CR080925-2-1

Run ID: cr080929-2a

Cleanup: NONE

Basis: Dry Weight

File Name: Manual Entry

Sample Allquot: 2.5 g

Final Volume: 100 ml

Result Units: MG/KG

Clean DF: 1

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
18540-29-9	CHROMIUM VI	1	0.41	0.41	U	

Data Package ID: cr0809034-1

Date Printed: Wednesday, October 01, 2008

Paragon Analytics

LMS Version: 6.196A

Page 1 of 1



# Gross Alpha/Beta Analysis by GFPC Sample Results Summary

Client Name: Washington State Dept. of Ecology

Laboratory Name: Paragon Analytics

Page: 1 of 1

Client Project Name: 182 Reservoir Sump Drains

PAI Work Order: 0809034

Reported on: Wednesday, September 24, 2008

Client Project Number: 100-H-28.6

3:42:03 PM

Lab Sample ID	Client Sample ID	Sample Type	Nuclide	Result +/- 2 s TPU	MDC	Units	Matrix	Prep Batch	Date Analyzed	Flags
0809034-1	Ecology-J17FY8	Sample	GROSS ALPHA	2.7 +/- 1.1	0.8	pCi/g	SOIL	AB080917-1	9/22/2008	LT
0809034-1	Ecology-J17FY8	Sample	GROSS BETA	2.22 +/- 0.92	1.46	pCi/g	SOIL	AB080917-1	9/22/2008	LT

**Comments:**

**Data Package ID:** AB0809034-1

**Qualifiers/Flags:**

U - Result is less than the sample specific MDC.

LT - Result is less than Requested MDC, greater than sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

M - The requested MDC was not met.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

**Abbreviations:**

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Date Printed: Wednesday, September 24, 2008

Paragon Analytics

Page 1 of 1

LIMS Version: 8.195A

# Gross Alpha/Beta Analysis by GFPC

PAI 724 Rev 10

## Sample Results

Lab Name: Paragon Analytics  
Work Order Number: 0809034  
Client Name: Washington State Dept. of Ecology  
ClientProject ID: 182 Reservoir Sump Drains 100-H-28:6

Field ID: Ecology-J17FY8

Lab ID: 0809034-1

Sample Matrix: SOIL

Prep SOP: PAI 702 Rev 19

Date Collected: 03-Sep-08

Date Prepared: 17-Sep-08

Date Analyzed: 22-Sep-08

Prep Batch: AB080917-1

QCBatchID: AB080917-1-1

Run ID: AB080917-1A

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 1.00 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: ABA0922C

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
12587-46-1	GROSS ALPHA	2.7 +/- 1.1	0.8	3	LT
12587-47-2	GROSS BETA	2.22 +/- 0.92	1.46	4	LT

### Comments:

#### Qualifiers/Flags:

U - Result is less than the sample specific MDC.

Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.

Y2 - Chemical Yield outside default limits.

LT - Result is less than Requested MDC, greater than sample specific MDC.

M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.

M - The requested MDC was not met.

#### Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)

MDC - Minimum Detectable Concentration (see PAI SOP 709)

BDL - Below Detection Limit

Data Package ID: AB0809034-1

# Gamma Spectroscopy Results

PAI 713 Rev 10

## Sample Results

**Lab Name:** Paragon Analytics  
**Work Order Number:** 0809034  
**Client Name:** Washington State Dept. of Ecology  
**Client/Project ID:** 182 Reservoir Sump Drains 100-H-28:8

<b>Field ID:</b> Ecology-J17FY8 <b>Lab ID:</b> 0809034-1  <b>Library:</b> FANP	<b>Sample Matrix:</b> SOIL <b>Prep SOP:</b> PAI 739 Rev 9 <b>Date Collected:</b> 03-Sep-08 <b>Date Prepared:</b> 11-Sep-08 <b>Date Analyzed:</b> 12-Sep-08	<b>Prep Batch:</b> GS080911-5 <b>QC Batch ID:</b> GS080911-5-1 <b>Run ID:</b> gs080911-5a <b>Count Time:</b> 30 minutes <b>Report Basis:</b> Dry Weight	<b>Final Aliquot:</b> 93.7 g <b>Prep Basis:</b> Dry Weight <b>Moisture(%):</b> NA <b>Result Units:</b> pCi/g <b>File Name:</b> 081011d03
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CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14331-83-0	Ac-228	0.54 +/- 0.71	1.16		U
14391-76-5	Ag-110m	-0.01 +/- 0.11	0.21		U
14682-66-7	Al-26	-0.06 +/- 0.12	0.28		U
14596-10-2	Am-241	0.15 +/- 0.84	1.48		U
13966-02-4	Be-7	-0.24 +/- 0.93	1.78		U
14913-49-6	Bi-212	2.2 +/- 1.6	2.1		TI
14733-03-0	Bi-214	0.60 +/- 0.32	0.43		J
13982-30-4	Ce-139	-0.041 +/- 0.067	0.129		U
14762-78-8	Ce-144	-0.26 +/- 0.47	0.90		U
14093-03-9	Co-56	0.17 +/- 0.22	0.35		U
13981-50-5	Co-57	0.014 +/- 0.059	0.103		U
13981-38-9	Co-58	0.03 +/- 0.10	0.18		U
10198-40-0	Co-60	-0.05 +/- 0.10	0.23		U
14392-02-0	Cr-51	-0.88 +/- 0.97	1.94		U
13967-70-9	Cs-134	-0.002 +/- 0.095	0.180		U

**Comments:**

**Qualifiers/Flags:**

U - Result is less than the sample specific MDC or less than the associated TPU Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed. Y2 - Chemical Yield outside default limits. LT - Result is less than Requested MDC, greater than sample specific MDC. M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC. M - The requested MDC was not met.  Abbreviations: TPU - Total Propagated Uncertainty (see PAI SOP 743) MDC - Minimum Detectable Concentration (see PAI SOP 709) BDL - Below Detection Limit	SQ - Spectral quality prevents accurate quantitation. SI - Nuclide identification and/or quantitation is tentative. TI - Nuclide identification is tentative. R - Nuclide has exceeded 8 half-lives. G - Sample density differs by more than 15% of LCS density.
--	--

**Data Package ID:** GSS0809034-1



# Gamma Spectroscopy Results

## PAI 713 Rev 10

### Sample Results

**Lab Name:** Paragon Analytics  
**Work Order Number:** 0809034  
**Client Name:** Washington State Dept. of Ecology  
**ClientProject ID:** 182 Reservoir Sump Drains 100-H-28:6

<b>Field ID:</b> Ecology-J17FY8 <b>Lab ID:</b> 0809034-1  <b>Library:</b> FANP	<b>Sample Matrix:</b> SOIL <b>Prep SOP:</b> PAI 739 Rev 9 <b>Date Collected:</b> 03-Sep-08 <b>Date Prepared:</b> 11-Sep-08 <b>Date Analyzed:</b> 12-Sep-08	<b>Prep Batch:</b> GS080911-5 <b>QCBatchID:</b> GS080911-5-1 <b>Run ID:</b> gs080911-5a <b>Count Time:</b> 30 minutes <b>Report Basis:</b> Dry Weight	<b>Final Aliquot:</b> 93.7 g <b>Prep Basis:</b> Dry Weight <b>Moisture(%):</b> NA <b>Result Units:</b> pCi/g <b>File Name:</b> 081011d03
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CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
10045-97-3	Cs-137	0.09 +/- 0.13	0.22	0.5	U
14683-23-9	Eu-152	-0.29 +/- 0.59	1.30		U
15585-10-1	Eu-154	-0.20 +/- 0.62	1.28		U
14391-16-3	Eu-155	-0.13 +/- 0.30	0.56		U
14596-12-4	Fe-59	0.08 +/- 0.25	0.45		U
10043-66-0	I-131	0.09 +/- 0.19	0.32		U
13966-00-2	K-40	12.3 +/- 3.5	3.0		
13966-31-9	Mn-54	-0.07 +/- 0.13	0.26		U
13966-32-0	Na-22	-0.08 +/- 0.14	0.30		U
14681-63-1	Nb-94	0.038 +/- 0.098	0.174		U
13967-76-5	Nb-95	0.03 +/- 0.13	0.23		U
15100-28-4	Pa-234m	6 +/- 20	36		U
15092-94-1	Pb-212	0.74 +/- 0.26	0.31		
15067-28-4	Pb-214	0.71 +/- 0.28	0.43		J
13967-48-1	Ru-106	0.15 +/- 0.98	1.80		U

**Comments:**

**Qualifiers/Flags:**

U - Result is less than the sample specific MDC or less than the associated TPU  
 Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.  
 Y2 - Chemical Yield outside default limits.  
 LT - Result is less than Requested MDC, greater than sample specific MDC.  
 M3 - The requested MDC was not met, but the reported activity is greater than the reported MDC.  
 M - The requested MDC was not met.

SQ - Spectral quality prevents accurate quantitation.  
 SI - Nuclide identification and/or quantitation is tentative.  
 TI - Nuclide identification is tentative.  
 R - Nuclide has exceeded 8 half-lives.  
 G - Sample density differs by more than 15% of LCS density.

**Abbreviations:**

TPU - Total Propagated Uncertainty (see PAI SOP 743)  
 MDC - Minimum Detectable Concentration (see PAI SOP 709)  
 BDL - Below Detection Limit

**Data Package ID:** GSS0809034-1



# Gamma Spectroscopy Results

PAI 713 Rev 10

Sample Results

Lab Name: Paragon Analytics  
Work Order Number: 0809034  
Client Name: Washington State Dept. of Ecology  
ClientProject ID: 182 Reservoir Sump Drains 100-H-28:6

Field ID: Ecology-J17FY8

Lab ID: 0809034-1

Library: FANP

Sample Matrix: SOIL

Prep SOP: PAI 739 Rev 9

Date Collected: 03-Sep-08

Date Prepared: 11-Sep-08

Date Analyzed: 12-Sep-08

Prep Batch: GS080911-5

QCBatchID: GS080911-5-1

Run ID: gs080911-5a

Count Time: 30 minutes

Report Basis: Dry Weight

Final Aliquot: 93.7 g

Prep Basis: Dry Weight

Moisture(%): NA

Result Units: pCi/g

File Name: 081011d03

CASNO	Target Nuclide	Result +/- 2 s TPU	MDC	Requested MDC	Lab Qualifier
14683-10-4	Sb-124	-0.09 +/- 0.11	0.23		U
14234-35-6	Sb-125	-0.03 +/- 0.29	0.54		U
13967-63-0	Sc-46	0.05 +/- 0.13	0.23		U
15623-47-9	Th-227	-0.26 +/- 0.87	1.58		U
15065-10-8	Th-234	-1.2 +/- 1.9	3.4		U
14913-50-9	Tl-208	0.21 +/- 0.16	0.25		U
15117-96-1	U-235	-0.11 +/- 0.55	0.99		U
13982-39-3	Zn-65	-0.14 +/- 0.30	0.60		U

## Comments:

### Qualifiers/Flags:

U - Result is less than the sample specific MDC or less than the associated TPU  
Y1 - Chemical Yield is in control at 100-110%. Quantitative Yield is assumed.  
Y2 - Chemical Yield outside default limits.  
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SQ - Spectral quality prevents accurate quantitation.  
SI - Nuclide identification and/or quantitation is tentative.  
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### Abbreviations:

TPU - Total Propagated Uncertainty (see PAI SOP 743)  
MDC - Minimum Detectable Concentration (see PAI SOP 709)  
BDL - Below Detection Limit

Data Package ID: GSS0809034-1

Date Printed: Tuesday, September 23, 2008

Paragon Analytics  
LIMS Version: 6.194A

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