

**START**

**0045384**

**200-BP-1 SITE INVESTIGATION  
ANALYTICAL CHEMISTRY SUPPORT PROJECT**

**TASKS 2 & 4**

**DATA PACKAGE/REPORT No. 11**

**Revision 0**

**February 14, 1992**



**Prepared by: B.M. Gillespie**

**Pacific Northwest Laboratory**

**(PNL Project #16772)**

## INTRODUCTION

This data package contains the results obtained by Pacific Northwest Laboratory (PNL) staff in the characterization of samples for the 200-BP-1 site investigation analytical chemistry support Project. The samples were submitted for analysis by Westinghouse Hanford Company (WHC) under the Technical Project Plan (TPP) 16772 and the Quality Assurance Project Plan (QAPjP) ALO-001. The samples are soil samples collected in support of Tasks 2 and 4. The analytical procedures required for analysis were defined in the Test Instructions (TI) prepared by the PNL 200-BP-1 Project Management Office in accordance with the TPP and the QAPjP ALO-001.

The samples (Table 1) were submitted with the appropriate WHC Chain of Custody (COC) and Sample Analysis Request Forms. The samples were delivered at refrigerated temperature to the 300 Area, 325 Building and 314 Building 200-BP-1 Sample Custodian.

The requested analyses for these samples were cyanide, free cyanide and ferrocyanide. A complex cyanide result is determined by the difference of the total cyanide and the free cyanide results. The quality control (QC) requirements for each sample are defined in the test instructions for each sample. The QC requirements outlined in the procedures and requested in the WHC SOW were followed. Sample duplicates, methods blank, matrix spikes and laboratory control standards were analyzed. All QC data that exist are included in this Data Package/Report.

The data in this package are reported in table 2. Three appendices are provided; one for Test Instruction, one for Chain of Custody, Sample Analysis Request Forms and Sample Receipt Forms and one that contains the primary inorganic analytical data.

CERTIFICATION STATEMENT

I certify that this data package is in compliance with the terms and conditions of the TPP 16772 and QAPJP ALO-001 for completeness. Release of the data contained in this hard copy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Project Manager or the Project Manager's designee, as verified by the following signature.

B. M. Gillespie

B. M. Gillespie  
200-BP-1 Project Manager

2-13-92

Date

**TABLE 1: 200-BP-1 Sample Numbers**

<u>WHC Sample Number</u>	<u>PNL ALO Sample Number</u>	<u>Sample Type</u>
B015M8(S)	92-01984	Soil
B015N2(S)	92-02224	Soil
B015N4(S)	92-02225	Soil
B015N6(S)	92-02226	Soil
B015N8(S)	92-02227	Soil

CYANIDE ANALYSIS RESULTS

Total cyanide analysis was performed in room 313 of building 325 in the Hanford Site 300 area. This data package includes cyanide results for five soil-sediment samples. Soil-sediment sample 92-01827 is not part of this data package. Cyanide results for Task 2&4 data package #11 are presented by colorimetric analysis run batch. Data package #11 results are summarized in Table 2.

Total cyanide results for soil-sediment samples and corresponding duplicates (where applicable) were below the instrument detection limit (IDL) of 0.6 mg/kg.

The 12 day hold time specified for cyanide analysis under the CLP protocol was met for all samples in this data package.

Average spiked soil-sediment sample cyanide recovery was 100% with a standard deviation of 5%.

Average recovery of cyanide for the laboratory control /initial calibration verification sample (ICV-6) was 91% with a standard deviation of 3% in the case of the soil-sediment samples. Recovery value for ICV-6 (LCS-0789, prepared by ICF Corporation) is based on the spiking of 2 ml of stock standard ICV-6 to 500 ml of deionized water and recovery back calculated to the original ICV-6 cyanide concentration.

Cyanide found in blanks analyzed for analysis groups within the data package were below the IDL.

TABLE 2: TOTAL CYANIDE ANALYSIS DATA FOR TASKS 2 AND 4  
SDG #11

SOIL-SEDIMENT SAMPLES

Sample ID#	PNL Log#	Sample G1 (mg/kg)	C	Sample dup. G2 (mg/kg)	C	%RPD	Blank G5 (µg/L)	C	Spike added (µg)	Sample+ spike G3 (mg/kg)	sample G4 (ICV) (mg/L)	Sample+ spike G3 recovery(%)	sample G4 (ICV) recovery(%)	Flags Q	Footnote#
B015M8	92-01984	0.6	U	0.6	U	N/A	5.9	U	48.9	10.7	8.63	106	92		1,2,3 (ALL)
B015M9	92-01827	14													4
B015N2	92-02224	0.6	U	0.6	U	N/A	5.9	U	48.6	10.2	8.1	100	86		
B015N4	92-02225	0.6	U												
B015N6	92-02226	0.6	U	0.6	U	N/A	5.9	U	48.6	9.5	8.8	94	94		
B015N8	92-02227	0.6	U												
										Mean		100	91		
										Std. Dev.		5	3		

Footnotes

1. Concentration of stock ICV-6=9.4 mg/L (18.4 µg of cyanide is added to each distillation flask and recovered in 250 mL of NaOH).
2. Contract required detection limit for soil-sediment = 1.0 mg/kg.
3. Duplicate precision under the CLP protocol must be within one CRDL when either sample or duplicate are below 5X CRDL.
4. Sample B015M9 is not part of this data package.

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FREE CYANIDE ANALYSIS RESULTS

Free cyanide analysis was not performed as samples must have a total cyanide concentration of greater than 2 mg/kg before free cyanide analysis is required.

Table 3: Free Cyanide Analysis Data

NO DATA REQUIRED

COMPLEX CYANIDE RESULTS

Complex cyanide cannot be determined from the existing total cyanide data as no free cyanide results were required.

Table 4: Complex (Ferro) Cyanide Determination

**NO DATA REQUIRED**

SAMPLE RECEIPT FORM

Delivered by: W. THOMPSON Date/Time: 11-21-91 = 1210

Received by: J. ROBBINS

Customer Name or Project: 200BP-1

Customer Sample Number(s): BØ15M8

ALO Sample Number(s): 92-01984

1. Customer Chain-of-Custody Form: Present  Absent

2. Additional Shipping Forms (list):

SAR

3. Custody Seals on Shipping and/or Sample Containers and their Conditions.

Present  Absent

If Present, Condition: INTACT

4. Sample Tag(s) ID Numbers if not Recorded on the Chain-of-Custody Record or on Sample Vial.

Notes: N/A

5. Condition of Shipping Container (i.e., broken container, dented, breached plastic bag, temperature of sample container as defined in Section 3.0 in PNL-ALO-051, etc.)

OK 0°C

6. Condition of Sample Vials.

OK

7. Verification of Agreement or Nonagreement of Information on Receiving Documents.

OK

8. Resolution of Problems or Discrepancies.

OK

RETURN COMPLETED FORM TO PROJECT MANAGER

B01 002





Westinghouse  
Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector M. C. Douglas, M. Campbell

Date Sampled 11-20-91 Time 1030 hours

Company Contact W. S. Thompson

Telephone (509) 376-2153

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B015M8	1; 125 ml; glass	Soil	CLP - Total CN, Free CN, Ferro CN
<div style="position: absolute; top: 50%; left: 50%; transform: translate(-50%, -50%); opacity: 0.5; font-size: 4em;">/</div>			

Field Information\*\* Sample was collected from the 216-B-49B borehole in support of 200-BP-1 Task 2 & 4 RI/FS.

Special Handling and/or Storage Keep samples chilled  
All analyses CLP

Possible Sample Hazards No chemical or radiological hazards detected with field instruments.

PART II: LABORATORY SECTION

Received by J. Robb Title Sr. RES. SCIENTIST Date 11-21-91

Analysis Required TOTAL + FREE CN

\*Indicate whether sample is soil, sludge, water, etc. **B01 004**  
 \*\*Use back of page for additional information relative to sample location.

SAMPLE RECEIPT FORM

Delivered by: M. DOUGLAS Date/Time: 12-4-91 12:30

Received by: J. ROBBINS

Customer Name or Project: 200 BP-1 TASK 284

Customer Sample Number(s): BO15N2, BO15N4, BO15N6, BO15N8

ALO Sample Number(s): 92-02224 TO 92-02227

1. Customer Chain-of-Custody Form: Present  Absent

2. Additional Shipping Forms (list):

SAR

3. Custody Seals on Shipping and/or Sample Containers and their Conditions.

Present  Absent

If Present, Condition: \_\_\_\_\_

4. Sample Tag(s) ID Numbers if not Recorded on the Chain-of-Custody Record or on Sample Vial.

Notes: N/A

5. Condition of Shipping Container (i.e., broken container, dented, breached plastic bag, temperature of sample container as defined in Section 3.0 in PNL-ALO-051, etc.)

OK

6. Condition of Sample Vials.

OK

7. Verification of Agreement or Nonagreement of Information on Receiving Documents.

OK

8. Resolution of Problems or Discrepancies.

OK

RETURN COMPLETED FORM TO PROJECT MANAGER

**B01-005**

Westinghouse Hanford  
Company

CHAIN OF CUSTODY

Body Form Initiator W.S. Thompson Project #: 91-019  
 Company Contact W. S. Thompson Telephone (509) 376-2153  
 Project Designation/Sampling Locations 200-BP-1 Operable Unit Collection Date 12/2/91  
Boring: 216-B-46A Time: 1008, 1008; 1318  
 Ice Chest No. PACE / KS #22 Field Logbook No. WHC-II-385-12  
 Bill of Lading/Airbill No. II/A Offsite Property No. II/A  
 Method of Shipment Hand Carry  
 Shipped to 325 PNL Laboratory (300 Area)

Possible Sample Hazards/Remarks No hazards indicated with field instruments.  
Keep samples chilled. All analysis is CLP.

Sample Identification

- ① B015N2  
1, 125ml; glass; soil; CLP- total cyanide, free CN; ferro CN
- ② B015N4  
1, 125ml; glass; soil; CLP- total CN, free CN; ferro CN
- ③ B015N6  
1, 125ml; glass; soil; CLP- total CN, free CN, ferro CN

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

Relinquished by: <u>W.S. Thompson</u> <u>Gandy Thompson</u>	Received by: <u>M. C. Douglas</u> <u>Matthew C. Douglas</u>	Date/Time: <u>12-4-91 1128</u>
Relinquished by: <u>M. C. Douglas</u> <u>Matthew C. Douglas</u>	Received by: <u>J ROBBINS</u> <u>J. Robbins</u>	Date/Time: <u>12-4-91 1230</u>
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method: Disposed by: Date/Time:

Comments: 301-006



Westinghouse Hanford  
Company

CHAIN OF CUSTODY

Company Form Initiator W.S. Thompson Project #: 91-019  
 Company Contact W. S. Thompson Telephone (509) 376-2153  
 Project Designation/Sampling Locations 200-BP-1 Operable Unit Collection Date 12/3/91  
Boring: 216-B-46A Time: 0857  
 Ice Chest No. PACE/KS #22 Field Logbook No. WHC-II-385-12  
 Bill of Lading/Airbill No. II/A Offsite Property No. II/A  
 Method of Shipment Hand Carry  
 Shipped to 325 PNL Laboratory (300 Area)

Possible Sample Hazards/Remarks No hazards indicated by field instruments  
Keep samples chilled. All analysis is CIP.

Sample Identification

(1) B015NB  
1, 125ml, glass, soil; CIP - total Cu, free Cu, ferro Cu.

Field Transfer of Custody		CHAIN OF POSSESSION		(Sign and Print Names)
Relinquished by: <u>W.S. Thompson</u> <u>Gwendys Thompson</u>	Received by: <u>M.C. Douglas</u> <u>Matthew C. Douglas</u>	Date/Time:	<u>12-4-91</u>	<u>1127</u>
Relinquished by: <u>M.C. Douglas</u> <u>Matthew C. Douglas</u>	Received by: <u>J. ROBBINS</u> <u>J. Robbins</u>	Date/Time:	<u>12-4-91</u>	<u>1230</u>
Relinquished by:	Received by:	Date/Time:		
Relinquished by:	Received by:	Date/Time:		

Final Sample Disposition

Disposal Method: Disposed by: Date/Time:

Comments: **B01-008**



9613490.0607

Samples were delivered directly to the Analysts. Therefore, no other PNL Chain of Custody forms were needed.

B02-002