308 --- Q200505230011

Scientific Notebook No. 631: Radionuclide Transport (RT) Key Technical Issue - Continuation of Scientific Notebook No. 517 (01/14/2004 through 05/03/2005)

LABORATORY NOTEBOOK

CNWRA/SwRI

CONTROLLED COPY # 631

NOTEBOOK NO. 631
ISSUED TO James D. Prikryl
ON 1/14/04 **20**____
DEPARTMENT _____
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James D. Pyle JP	
Jonathan M Brown JB	
Bradley Watkins BW	
Miriam Puckett MP	
Marla Roberts MR	

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1/14/04 JP

Radionuclide Transport (RT) KTI

20.06002.01.141

Characterization of EWDP core samples.

Initial only 1/14/04 by James D. [illegible]

Individuals performing activities - John Brown, Marla Roberts.

This notebook documents laboratory studies being conducted for the RT KTI.

* Note: this notebook is a continuation of scientific notebook 517.

Objective - characterizing the mineralogy and chemistry of EWDP core samples

Methods - surface area analysis, sieve analysis, x-ray fluorescence.

JP

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Coulter SA 3100 Surface Area and Pore Size Analyzer
Analysis Report

Serial No.	w46020	Software Version	2.11
Sample ID	EWDP-58	Start Date	~~11/05/03~~ 1/13/04
Customer	CNWRA	Start Time	11:38:55
Operator	JMB	Elapsed Time	45 min
Sample Wt	2.0809 g	Outgas Time	720 min
Profile	BET5	Outgas Temperature	350 C

1-15-04

Summary

NC-Washburn-1X
610-615 ft
1010 876

Surface Area Report

BET Surface area	18.650 sq.m/g
Correlation Coefficient	0.99988

Coulter SA 3100 Surface Area and Pore Size Analyzer
Analysis Report

Serial No.	w46020	Software Version	2.11
Sample ID	EWDP-61	Start Date	~~11/05/03~~ 1-13-04
Customer	CNWRA	Start Time	13:55:23
Operator	JMB	Elapsed Time	47 min
Sample Wt	2.1568 g	Outgas Time	720 min
Profile	BET5	Outgas Temperature	350 C

1-15-04

Summary

NC-Washburn-1X
640-645
1010 879

Surface Area Report

BET Surface area	12.214 sq.m/g
Correlation Coefficient	0.99986

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Coulter SA 3100 Surface Area and Pore Size Analyzer
Analysis Report

Serial No.	w46020	Software Version	2.13
Sample ID	EWDP-61	Start Date	01/30/04
Customer	CNWRA	Start Time	09:31:21
Operator	JMB	Elapsed Time	46 min
Sample Wt	2.1099 g	Outgas Time	720 min
Profile	BET5-T	Outgas Temperature	350 C

Summary

Total Surface Area 12.159 sq.m/g

t-Plot Surface Area Report

2-9-04

NC-Washburn-1X
640-645 ft
1010 879

t-Plot Surface Area	8.042 sq.m/g
Micropore Surface Area	4.117 sq.m/g
Micropore Volume	0.00179 ml/g
Correlation Coefficient	0.99925

Coulter SA 3100 Surface Area and Pore Size Analyzer
Analysis Report

Serial No.	w46020	Software Version	2.13
Sample ID	EWDP-66	Start Date	01/30/04
Customer	CNWRA	Start Time	10:35:35
Operator	JMB	Elapsed Time	58 min
Sample Wt	2.2738 g	Outgas Time	720 min
Profile	BET5-T	Outgas Temperature	350 C

Summary

Total Surface Area 30.699 sq.m/g

t-Plot Surface Area Report

2-9-04

NC-EWDP-02D
35-40 ft
1010 551

t-Plot Surface Area	19.977 sq.m/g
Micropore Surface Area	10.722 sq.m/g
Micropore Volume	0.00464 ml/g
Correlation Coefficient	0.99879

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Coulter SA 3100 Surface Area and Pore Size Analyzer
Analysis Report

Serial No.	w46020	Software Version	2.13
Sample ID	EWDP-73	Start Date	01/30/04
Customer	CNWRA	Start Time	11:50:47
Operator	JMB	Elapsed Time	49 min
Sample Wt	2.2506 g	Outgas Time	720 min
Profile	BET5-T	Outgas Temperature	350 C

Total Surface Area 11.069 sq.m/g
JB 2-9-04
NC-EWDP-02D
105-110 gx
1010 559

Summary

t-Plot Surface Area Report

t-Plot Surface Area	6.812 sq.m/g
Micropore Surface Area	4.256 sq.m/g
Micropore Volume	0.00186 ml/g
Correlation Coefficient	0.99841

Coulter SA 3100 Surface Area and Pore Size Analyzer
Analysis Report

NC-EWDP-19PB-350.8-352.4 <#35 B

Serial No.	w46020	Software Version	2.13
Sample ID	19PB-350	Start Date	01/31/04
Customer	CNWRA	Start Time	11:47:16
Operator	JMB	Elapsed Time	58 min
Sample Wt	1.954 g	Outgas Time	720 min
Profile	BET5-T	Outgas Temperature	350 C

Total Surface Area 33.517 sq.m/g
JB 2-9-04

Summary

t-Plot Surface Area Report

t-Plot Surface Area	23.648 sq.m/g
Micropore Surface Area	9.869 sq.m/g
Micropore Volume	0.00425 ml/g
Correlation Coefficient	0.99943

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Coulter SA 3100 Surface Area and Pore Size Analyzer
Analysis Report

NC-EWDP-19PB-355.0-356.6 <#35 B

Serial No.	w46020	Software Version	2.13
Sample ID	19PB-355	Start Date	01/31/04
Customer	CNWRA	Start Time	15:16:24
Operator	JMB	Elapsed Time	50 min
Sample Wt	1.9944 g	Outgas Time	720 min
Profile	BET5-T	Outgas Temperature	350 C

Total Surface Area 22.681 sq.m/g
JB 2-9-04

Summary

t-Plot Surface Area Report

t-Plot Surface Area	17.300 sq.m/g
Micropore Surface Area	5.381 sq.m/g
Micropore Volume	0.00229 ml/g
Correlation Coefficient	0.99985

Coulter SA 3100 Surface Area and Pore Size Analyzer
Analysis Report

NC-EWDP-19PB-364.9-366.7 <#35 B

Serial No.	w46020	Software Version	2.13
Sample ID	19PB-364	Start Date	01/31/04
Customer	CNWRA	Start Time	16:50:14
Operator	JMB	Elapsed Time	49 min
Sample Wt	1.9875 g	Outgas Time	720 min
Profile	BET5-T	Outgas Temperature	350 C

Total Surface Area 19.692 sq.m/g
JB 2-9-04

Summary

t-Plot Surface Area Report

t-Plot Surface Area	14.183 sq.m/g
Micropore Surface Area	5.509 sq.m/g
Micropore Volume	0.00238 ml/g
Correlation Coefficient	0.99965

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Coulter SA 3100 Surface Area and Pore Size Analyzer
Analysis Report

NC-EWDP-19PB-367.0-368.5 <#35B

Serial No.	w46020	Software Version	2.13
Sample ID	19PB-367	Start Date	02/01/04
Customer	CNWRA	Start Time	11:31:20
Operator	JMB	Elapsed Time	59 min
Sample Wt	2.0258 g	Outgas Time	720 min
Profile	BET5-T	Outgas Temperature	350 C

Summary Total Surface Area 21.353 sq.m/g 2-9-04

t-Plot Surface Area Report

t-Plot Surface Area	15.212 sq.m/g
Micropore Surface Area	6.141 sq.m/g
Micropore Volume	0.00265 ml/g
Correlation Coefficient	0.99970

Coulter SA 3100 Surface Area and Pore Size Analyzer
Analysis Report

NC-EWDP-19PB-373.6-374.6 <#35B

Serial No.	w46020	Software Version	2.13
Sample ID	19PB-373	Start Date	02/01/04
Customer	CNWRA	Start Time	14:03:33
Operator	JMB	Elapsed Time	56 min
Sample Wt	2.0068 g	Outgas Time	720 min
Profile	BET5-T	Outgas Temperature	350 C

Summary Total Surface Area 33.476 sq.m/g 2-9-04

t-Plot Surface Area Report

t-Plot Surface Area	23.945 sq.m/g
Micropore Surface Area	9.531 sq.m/g
Micropore Volume	0.00408 ml/g
Correlation Coefficient	0.99949

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Coulter SA 3100 Surface Area and Pore Size Analyzer
Analysis Report

NC-EWDP-19PB-374.6-375.4 <#35B

Serial No.	w46020	Software Version	2.13
Sample ID	19PB-374	Start Date	02/01/04
Customer	CNWRA	Start Time	15:19:29
Operator	JMB	Elapsed Time	51 min
Sample Wt	2.0975 g	Outgas Time	720 min
Profile	BET5-T	Outgas Temperature	350 C

Summary Total Surface Area 25.452 sq.m/g 2-9-04

t-Plot Surface Area Report

t-Plot Surface Area	18.582 sq.m/g
Micropore Surface Area	6.870 sq.m/g
Micropore Volume	0.00294 ml/g
Correlation Coefficient	0.99955

Coulter SA 3100 Surface Area and Pore Size Analyzer
Analysis Report

NC-EWDP-19PB-382.4-383.7 <#35B

Serial No.	w46020	Software Version	2.13
Sample ID	19PB-382	Start Date	02/02/04
Customer	CNWRA	Start Time	11:44:23
Operator	JMB	Elapsed Time	59 min
Sample Wt	1.9062 g	Outgas Time	720 min
Profile	BET5-T	Outgas Temperature	350 C

Summary Total Surface Area 39.278 sq.m/g 2-9-04

t-Plot Surface Area Report

t-Plot Surface Area	28.259 sq.m/g
Micropore Surface Area	11.019 sq.m/g
Micropore Volume	0.00473 ml/g
Correlation Coefficient	0.99946

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Coulter SA 3100 Surface Area and Pore Size Analyzer
Analysis Report

NC-EWDP-19PB-387.2-388.9 <#35B

Serial No.	w46020	Software Version	2.13
Sample ID	19PB-387	Start Date	02/02/04
Customer	CNWRA	Start Time	13:52:36
Operator	JMB	Elapsed Time	56 min
Sample Wt	1.9441 g	Outgas Time	720 min
Profile	BET5-T	Outgas Temperature	350 C

Summary Total Surface Area 33.560 sq.m/g JB 2-9-04

t-Plot Surface Area Report

t-Plot Surface Area	24.256 sq.m/g
Micropore Surface Area	9.304 sq.m/g
Micropore Volume	0.00399 ml/g
Correlation Coefficient	0.99952

Coulter SA 3100 Surface Area and Pore Size Analyzer
Analysis Report

NC-EWDP-19PB-401.1-406.1 (dry) <#35B

Serial No.	w46020	Software Version	2.13
Sample ID	19PB-401	Start Date	02/02/04
Customer	CNWRA	Start Time	15:09:44
Operator	JMB	Elapsed Time	1 hrs 2 min
Sample Wt	1.8618 g	Outgas Time	720 min
Profile	BET5-T	Outgas Temperature	350 C

Summary Total Surface Area 30.321 sq.m/g JB 2-9-04

t-Plot Surface Area Report

t-Plot Surface Area	21.610 sq.m/g
Micropore Surface Area	8.711 sq.m/g
Micropore Volume	0.00375 ml/g
Correlation Coefficient	0.99960

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Coulter SA 3100 Surface Area and Pore Size Analyzer
Analysis Report

NC-EWDP-19PB-406.3-407.5 <#35B

Serial No.	w46020	Software Version	2.13
Sample ID	19PB-406	Start Date	02/03/04
Customer	CNWRA	Start Time	11:44:51
Operator	JMB	Elapsed Time	57 min
Sample Wt	1.9748 g	Outgas Time	720 min
Profile	BET5-T	Outgas Temperature	350 C

Summary Total Surface Area 29.285 sq.m/g JB 2-9-04

t-Plot Surface Area Report

t-Plot Surface Area	20.886 sq.m/g
Micropore Surface Area	8.399 sq.m/g
Micropore Volume	0.00362 ml/g
Correlation Coefficient	0.99958

Coulter SA 3100 Surface Area and Pore Size Analyzer
Analysis Report

NC-EWDP-19PB-408.5-409.9 (dry) <#35B

Serial No.	w46020	Software Version	2.13
Sample ID	19PB-408	Start Date	02/03/04
Customer	CNWRA	Start Time	14:03:50
Operator	JMB	Elapsed Time	57 min
Sample Wt	1.8711 g	Outgas Time	720 min
Profile	BET5-T	Outgas Temperature	350 C

Summary Total Surface Area 39.272 sq.m/g JB 2-9-04

t-Plot Surface Area Report

t-Plot Surface Area	28.061 sq.m/g
Micropore Surface Area	11.211 sq.m/g
Micropore Volume	0.00482 ml/g
Correlation Coefficient	0.99952

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Coulter SA 3100 Surface Area and Pore Size Analyzer
Analysis Report

NC-EWDP-19PB-409.9-411.9 <#35B

Serial No. w46020 Software Version 2.13

Sample ID	19PB-409	Start Date	02/03/04
Customer	CNWRA	Start Time	17:00:49
Operator	JMB	Elapsed Time	52 min
Sample Wt	1.9697 g	Outgas Time	720 min
Profile	BET5-T	Outgas Temperature	350 C

Summary

Total Surface Area 26.598
2-9-04

t-Plot Surface Area Report

t-Plot Surface Area	19.281 sq.m/g
Micropore Surface Area	7.318 sq.m/g
Micropore Volume	0.00314 ml/g
Correlation Coefficient	0.99962

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Coulter SA 3100 Surface Area and Pore Size Analyzer
Analysis Report

NC-EWDP-19PB-418.4-419.6 (dry) <#35B

Serial No. w46020 Software Version 2.13

Sample ID	19PB-418	Start Date	02/04/04
Customer	CNWRA	Start Time	18:56:49
Operator	JMB	Elapsed Time	58 min
Sample Wt	1.9644 g	Outgas Time	720 min
Profile	BET5-T	Outgas Temperature	350 C

t-Plot Surface Area Report

t-Plot Surface Area	24.782 sq.m/g
Total Surface Area	34.406 sq.m/g
Micropore Surface Area	9.624 sq.m/g
Micropore Volume	0.00412 ml/g
Film Thickness Range	0.35 to 0.50
Slope	16.0193
Intercept	2.66459
Correlation Coefficient	0.99953

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Coulter SA 3100 Surface Area and Pore Size Analyzer
Analysis Report

NC-EWDP-19PB-419.6-421.2 (dry) <#35B

Serial No. w46020 Software Version 2.13

Sample ID	19PB-419	Start Date	02/04/04
Customer	CNWRA	Start Time	20:21:23
Operator	JMB	Elapsed Time	54 min
Sample Wt	2.0693 g	Outgas Time	720 min
Profile	BET5-T	Outgas Temperature	350 C

t-Plot Surface Area Report

t-Plot Surface Area	23.568 sq.m/g
Total Surface Area	32.392 sq.m/g
Micropore Surface Area	8.824 sq.m/g
Micropore Volume	0.00377 ml/g
Film Thickness Range	0.35 to 0.50
Slope	15.2347
Intercept	2.43471
Correlation Coefficient	0.99950

Coulter SA 3100 Surface Area and Pore Size Analyzer
Analysis Report

NC-EWDP-19PB-422.5-424.4 (dry) <#35B

Serial No. w46020 Software Version 2.13

Sample ID	19PB-422	Start Date	02/04/04
Customer	CNWRA	Start Time	21:32:00
Operator	JMB	Elapsed Time	55 min
Sample Wt	2.2021 g	Outgas Time	720 min
Profile	BET5-T	Outgas Temperature	350 C

t-Plot Surface Area Report

t-Plot Surface Area	21.759 sq.m/g
Total Surface Area	30.050 sq.m/g
Micropore Surface Area	8.291 sq.m/g
Micropore Volume	0.00354 ml/g
Film Thickness Range	0.35 to 0.50
Slope	14.0655
Intercept	2.28603
Correlation Coefficient	0.99940

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Coulter SA 3100 Surface Area and Pore Size Analyzer
Analysis Report

NC-EWDP-19PB-424.6-428.7 (dry) < #35 B

Serial No.	w46020	Software Version	2.13
Sample ID	19PB-424	Start Date	02/07/04
Customer	CNWRA	Start Time	18:14:21
Operator	JMB	Elapsed Time	50 min
Sample Wt	2.0796 g	Outgas Time	720 min
Profile	BET5-T	Outgas Temperature	350 C

t-Plot Surface Area Report

t-Plot Surface Area	20.630 sq.m/g
Total Surface Area	28.599 sq.m/g
Micropore Surface Area	7.969 sq.m/g
Micropore Volume	0.00333 ml/g
Film Thickness Range	0.35 to 0.50
Slope	18.3355
Intercept	2.15122
Correlation Coefficient	0.99949

Coulter SA 3100 Surface Area and Pore Size Analyzer
Analysis Report

NC-EWDP-19PB-441.2-442.9 (dry) < #35 B

Serial No.	w46020	Software Version	2.13
Sample ID	19PB-441	Start Date	02/07/04
Customer	CNWRA	Start Time	19:16:18
Operator	JMB	Elapsed Time	53 min
Sample Wt	2.0168 g	Outgas Time	720 min
Profile	BET5-T	Outgas Temperature	350 C

t-Plot Surface Area Report

t-Plot Surface Area	21.093 sq.m/g
Total Surface Area	30.680 sq.m/g
Micropore Surface Area	9.587 sq.m/g
Micropore Volume	0.00416 ml/g
Film Thickness Range	0.35 to 0.50
Slope	13.6350
Intercept	2.68779
Correlation Coefficient	0.99950

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Coulter SA 3100 Surface Area and Pore Size Analyzer
Analysis Report

NC-EWDP-19PB-457.2-460.7 (dry) < #35 B

Serial No.	w46020	Software Version	2.13
Sample ID	19PB-457	Start Date	02/07/04
Customer	CNWRA	Start Time	20:22:17
Operator	JMB	Elapsed Time	54 min
Sample Wt	2.0599 g	Outgas Time	720 min
Profile	BET5-T	Outgas Temperature	350 C

t-Plot Surface Area Report

t-Plot Surface Area	16.293 sq.m/g
Total Surface Area	22.865 sq.m/g
Micropore Surface Area	6.572 sq.m/g
Micropore Volume	0.00282 ml/g
Film Thickness Range	0.35 to 0.50
Slope	10.5322
Intercept	1.82072
Correlation Coefficient	0.99942

Coulter SA 3100 Surface Area and Pore Size Analyzer
Analysis Report

NC-EWDP-19PB-470.5-474.3 (dry) < #35 B

Serial No.	w46020	Software Version	2.13
Sample ID	19PB-470	Start Date	02/08/04
Customer	CNWRA	Start Time	18:59:22
Operator	JMB	Elapsed Time	54 min
Sample Wt	2.0033 g	Outgas Time	720 min
Profile	BET5-T	Outgas Temperature	350 C

t-Plot Surface Area Report

t-Plot Surface Area	20.641 sq.m/g
Total Surface Area	29.077 sq.m/g
Micropore Surface Area	8.436 sq.m/g
Micropore Volume	0.00363 ml/g
Film Thickness Range	0.35 to 0.50
Slope	13.3426
Intercept	2.34477
Correlation Coefficient	0.99952

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Coulter SA 3100 Surface Area and Pore Size Analyzer
Analysis Report

NL-EWDP-19PB-496.7-499.0 (dry) <#35B

Serial No.	w46020	Software Version	2.13
Sample ID	19PB-496	Start Date	02/08/04
Customer	CNWRA	Start Time	20:19:55
Operator	JMB	Elapsed Time	1hrs 1 min
Sample Wt	2.0284 g	Outgas Time	720 min
Profile	BET5-T	Outgas Temperature	350 C

t-Plot Surface Area Report

t-Plot Surface Area	22.070 sq.m/g
Total Surface Area	30.462 sq.m/g
Micropore Surface Area	8.392 sq.m/g
Micropore Volume	0.00359 ml/g
Film Thickness Range	0.35 to 0.50
Slope	14.2662
Intercept	2.32150
Correlation Coefficient	0.99955

Coulter SA 3100 Surface Area and Pore Size Analyzer
Analysis Report

NL-EWDP-19PB-503.4-506.0 (dry) <#35B

Serial No.	w46020	Software Version	2.13
Sample ID	19PB-503	Start Date	02/08/04
Customer	CNWRA	Start Time	21:38:14
Operator	JMB	Elapsed Time	52 min
Sample Wt	2.0023 g	Outgas Time	720 min
Profile	BET5-T	Outgas Temperature	350 C

t-Plot Surface Area Report

t-Plot Surface Area	18.098 sq.m/g
Total Surface Area	25.150 sq.m/g
Micropore Surface Area	7.053 sq.m/g
Micropore Volume	0.00302 ml/g
Film Thickness Range	0.35 to 0.50
Slope	11.6986
Intercept	1.95065
Correlation Coefficient	0.99950

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Coulter SA 3100 Surface Area and Pore Size Analyzer
Analysis Report

NL-EWDP-19PB-547.6-549.6 (dry) <#35B

Serial No.	w46020	Software Version	2.13
Sample ID	19PB-547	Start Date	02/09/04
Customer	CNWRA	Start Time	18:36:02
Operator	JMB	Elapsed Time	56 min
Sample Wt	2.2101 g	Outgas Time	720 min
Profile	BET5-T	Outgas Temperature	350 C

t-Plot Surface Area Report

t-Plot Surface Area	21.614 sq.m/g
Total Surface Area	30.183 sq.m/g
Micropore Surface Area	8.569 sq.m/g
Micropore Volume	0.00370 ml/g
Film Thickness Range	0.35 to 0.50
Slope	13.9713
Intercept	2.39338
Correlation Coefficient	0.99964

Coulter SA 3100 Surface Area and Pore Size Analyzer
Analysis Report

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NL-EWDP-19PB-~~552.35~~ 555.2-557.8 (dry) <#35B

Serial No.	w46020	Software Version	2.13
Sample ID	19PB-552	Start Date	02/09/04
Customer	CNWRA	Start Time	20:24:08
Operator	JMB	Elapsed Time	57 min
Sample Wt	2.0662 g	Outgas Time	720 min
Profile	BET5-T	Outgas Temperature	350 C

t-Plot Surface Area Report

t-Plot Surface Area	17.604 sq.m/g
Total Surface Area	25.244 sq.m/g
Micropore Surface Area	7.640 sq.m/g
Micropore Volume	0.00331 ml/g
Film Thickness Range	0.35 to 0.50
Slope	11.3793
Intercept	2.14225
Correlation Coefficient	0.99964

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Coulter SA 3100 Surface Area and Pore Size Analyzer
Analysis Report

NL-EWDP-19PB-584.1-587.4 (dry) <# 35 B

Serial No.	w46020	Software Version	2.13
Sample ID	19PB-584	Start Date	02/09/04
Customer	CNWRA	Start Time	21:48:47
Operator	JMB	Elapsed Time	57 min
Sample Wt	2.0888 g	Outgas Time	720 min
Profile	BET5-T	Outgas Temperature	350 C

t-Plot Surface Area Report

t-Plot Surface Area	18.525sq.m/g
Total Surface Area	25.705 sq.m/g
Micropore Surface Area	7.180 sq.m/g
Micropore Volume	0.00309 ml/g
Film Thickness Range	0.35 to 0.50
Slope	11.9746
Intercept	1.99937
Correlation Coefficient	0.99970

Coulter SA 3100 Surface Area and Pore Size Analyzer
Analysis Report

NL-EWDP-19PB-595.2-596.2 (dry) <# 35 B

Serial No.	w46020	Software Version	2.13
Sample ID	19PB-595	Start Date	02/10/04
Customer	CNWRA	Start Time	23:37:12
Operator	JMB	Elapsed Time	57 min
Sample Wt	2.0817 g	Outgas Time	720 min
Profile	BET5-T	Outgas Temperature	350 C

t-Plot Surface Area Report

t-Plot Surface Area	19.803 sq.m/g
Total Surface Area	27.769 sq.m/g
Micropore Surface Area	7.965 sq.m/g
Micropore Volume	0.00344 ml/g
Film Thickness Range	0.35 to 0.50
Slope	12.8010
Intercept	2.22583
Correlation Coefficient	0.99970

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Coulter SA 3100 Surface Area and Pore Size Analyzer
Analysis Report

NL-EWDP-19PB-631.1-633.8 (dry) <# 35 B

Serial No.	w46020	Software Version	2.13
Sample ID	19PB-631	Start Date	02/11/04
Customer	CNWRA	Start Time	01:44:55
Operator	JMB	Elapsed Time	59 min
Sample Wt	2.1721 g	Outgas Time	720 min
Profile	BET5-T	Outgas Temperature	350 C

t-Plot Surface Area Report

t-Plot Surface Area	16.552 sq.m/g
Total Surface Area	23.169 sq.m/g
Micropore Surface Area	6.617 sq.m/g
Micropore Volume	0.00287 ml/g
Film Thickness Range	0.35 to 0.50
Slope	10.6994
Intercept	1.85713
Correlation Coefficient	0.99975

Coulter SA 3100 Surface Area and Pore Size Analyzer
Analysis Report

Standard

Serial No.	w46020	Software Version	2.13
Sample ID	1899	Start Date	02/11/04
Customer	CNWRA	Start Time	03:36:08
Operator	JMB	Elapsed Time	33 min
Sample Wt	1.6938 g	Outgas Time	720 min
Profile	BET5-T	Outgas Temperature	350 C

t-Plot Surface Area Report

t-Plot Surface Area	9.388 sq.m/g
Total Surface Area	9.675 sq.m/g
Micropore Surface Area	0.287 sq.m/g
Micropore Volume	0.00003 ml/g
Film Thickness Range	0.35 to 0.50
Slope	6.0684
Intercept	0.01987
Correlation Coefficient	0.99998

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JP
10/5/04

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TITLE Book No.

From Page No.

10/5/04 JP

Determine effect of spike 46A on pH of sample NC-EWDP-19PB-SHAL-0504-FUA-2

Place 30 ml of NE-EWDP-19PB-SHAL-0504-FUA-2 in a 50 ml polycarbonate centrifuge tube.

Place stir bar in tube & measure pH.

pH = 8.48

Transfer 100 µl of spike 46A to tube and measure pH.

pH = 8.48

Spike had no effect on pH.

8 Oct. 04 JB

Calibration of pH meter

meter: Orion model 920A S/N 039518
probe: Thermo Orion 8103BN
Fisher Buffer soln 7.00 (lot 033316-24, cat # SB108-500) and 10 (lot 033031-24, cat # SB116-500)

Two buffer calibration points were used, pH 7.02 and 10.06. Temperature was 19.1 °C. The slope of the calibration was 99.9 (Target of acceptable slope is 92-102 %).

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pH reading of ground water sample (NC-EWDP-19PB-SHAL-0504-FWA-2) was 8.52. Calibration check of pH meter + probe was 7.02 (target pH 7.02).

A 10 mL sample (NC-EWDP-19PB-~~SA~~ 10-8-04 SHAL-0504-FWA-2) was removed with an Oxford macro pipet and placed into a small disposable plastic beaker for the pH measurement.

Weighing and adding sediment (alluvium) sample to polycarbonate centrifuge tubes, and labeling

Six polycarbonate centrifuge tubes that have been acid washed (~40 mL capacity) were labeled AL1-Np-1 through 6 with a sharpy. One polycarbonate centrifuge tube (PC tube) was labeled AL1-Np-INp.

Weighing PC tubes

A 30 mL glass beaker (spout directed to right) was used to stabilize the PC tubes on the balance. The Mettler AE 240 scale (S/N 101237) was used to weigh the labeled PC tubes. The scale was tared with the beaker on it then the ~~test~~ 10-8-04 PC tubes were placed in and the measurement was taken.

Inital calibration check (target 20.0001 g) reading 20.0001 g

Sample ID	Weight of empty tube (g)	Weight of tube after addition of alluvium (g)
AL1-Np-1	21.9644	22.4634
AL1-Np-2	22.1687	22.6679
AL1-Np-3	22.1445	22.6428
AL1-Np-4	22.4869	22.9863
AL1-Np-5	22.0216	22.5206
AL1-Np-6	22.1933	22.6929
AL1-Np-INp	22.2007	——

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Final calibration check of scale (target 20.0001 g) reading 20.0001 g

Adding alluvium to tubes

Alluvium sample (NC-EWDP-19PB-406.3-407.5 <#35 mesh A) was transfered into the 6 PC tubes (AL1-Np-1 through 6) (631/20). A glass beaker (30 mL) was placed on the Mettler AE 240 scale (S/N 101237) with the ~~test~~ 10-8-04 PC tube in it without its cap, and tared. The alluvium sample was transfered with a spatula (0.5 ± 0.001 g). Once the sample was taken the PC tube was removed and capped. The empty 30 mL beaker was tared, then the PC tube with its cap and sample were weighed and recorded on 631/20.

Addition of groundwater sample to sample tubes for Np + alluvium sorption experiment

30 ± 0.1 g of NC-EWDP-19PB-SHAL-0504-FWA-2 groundwater sample transfered to the Polycarbonate centrifuge tubes (PC tubes) (631/20), with an Oxford macro pipet 10 mL at a time.

A 30 mL glass beaker is placed on the Mettler AE 240 scale (S/N 101237) with a PC tube in it with its cap off. The scale is tared, then the groundwater sample is added. Lastly the cap is placed on the PC tube and the glass beaker is tared by its self. Then the PC tube is weighed and recorded on 631/22.

10-8-04 [illegible]

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Sample ID	Weight of tube after addition of solution (g)
AL1-Np-1	52.5017
AL1-Np-2	52.7357
AL1-Np-3	52.6913
AL1-Np-4	53.0565
AL1-Np-5	52.5678
AL1-Np-6	52.7879
AL1-Np-INp	52.2217

12 Oct. 04 [initials]

Weighing of test tube + soln + alluvium for Np sorption experiment

Each of the 7, test tubes with solution (groundwater) and alluvium samples, were weighed after 3 days of equilibrium. A 30 mL glass beaker was placed on the Mettler AE240 scale (S/N 101237) and tared. The glass beaker was used to balance the test-tubes. Readings recorded in table below.
Inital calibration check (target 20.0001 g)
(reading 20.0000 g)
Final calibration check (target 20.0001 g)
reading 20.000

Sample ID (631/22)	Weight of tube after solid/soln equilibrium (about 3 days) (g)	Weight of tube after Np spike added (g)
AL1-Np-1	52.4431	52.5421
AL1-Np-2	52.6494	52.7492
AL1-Np-3	52.6314	52.7310
AL1-Np-4	52.9967	53.0961
AL1-Np-5	52.5168	52.6160
AL1-Np-6	52.7334	52.8326
AL1-Np-INp	52.1719	52.2722

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Addition of Np spike solution to sample tubes

Spike: 46A, 237 Np, ~60 ppm, (556/84)

100 µL of ~~spike~~ 10-12-04 Np spike was transfered into the 7 polycarbonate centrifuge test tubes (631/20-22) with an Eppendorf 100 µL pipet. This should produce ~200 ~~ppm~~ ppb 1-11-05 Np in the test tubes.

After spike added the tubes were ~~recorded~~ 10-12-04 reweighed and recorded on 631/22. 10-12-04 Weighing procedures are the same as on 631/22.
Inital calibration check (Target 20.0001 g)
(reading 20.0001 g)
Final calibration check (Target 20.0001 g)
(reading 20.0001 g)

Addition of HNO_3 to AL1-Np-INp tube sample

Creation of 50/50 vol/vol of HNO_3/water.
3 mL of Nanopure water was transfered into a 15 mL plastic beaker with a volumetric pipet. Then 3 mL of Fisher Nitric Acid (A200-212, Lot # 040708) was added to the water with a volumetric pipet. Gently swirled. A 100 µL sample of 50/50 (HNO_3/water) was transfered with an Eppendorf 100 µL pipet into the tube labled AL1-Np-INp (631/22).

Addition of 0.02 M HNO_3 and AL1-Np-INp to two LSC vials, weighing

Two, 7 mL Liquid Scintillation ~~Analep~~ 10-12-04 (LSC) vials were labled AL1-Np-INp-a and AL1-Np-INp-b on their caps.

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From Page No.____ 12 Oct. 04 cont. AB

Creating 0.02 M HNO_3

12.6 mL of Fisher Nitric Acid (A200-212, Lot#040708) was transfered into a 100 mL vol Flask with an eppendorf reference adjustable pipet. The 100 mL Flask was filled to line with nanopure water.

Adding 0.5 mL of 0.02 M HNO_3 to LSC vial

0.5 mL of 0.02 M HNO_3 was transfered to the two LSC vials (631/23) with a 500 uL Eppendorf Pipet. Each LSC vial was then weighed on the Mettler AE 240 scale (S/N 101237) and recorded on (631/23). 10-12-04 AB

Initial calibration check of scale (Target 20.0001g) reading 20.0001g

Final calibration check of scale (Target 20.0001g) reading 20.0001g

Height of AL1-Np-INp test tube also taken and recorded.

Transferring 0.5 mL of AL1-Np-INp to LSC vials

A 500 ~~mg~~ uL eppendorf pipet was used to transfer ~~0.0~~ 0.5 mL of solution from AL1-Np-INp into the two LSC vials (AL1-Np-INp-a and AL1-Np-INp-b). 10-12-04 AB The LSC vials and test tube AL1-Np-INp were weighed after transferring soln on the Mettler AE 240 scale (S/N 101237). Data recorded on table below.

Sample ID	Weight of 7 ml LSC vial plus 0.5 ml of 0.02 M HNO3 (g)	Weight of vial with 0.5 ml of sample solution added (g)
AL1-Np-INp-a	7.8949	8.3939
AL1-Np-INp-b	7.9070	8.4056
	Weight of tube before sampling	Weight of tube after sampling
AL1-Np-INp	52.3921	51.3932

10-12-04 AB

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From Page No.____ 12 Oct. 04 cont. AB

Addition of cocktail to LSC vial

5 mL of Ultima Gold AB (Lot# 6013309, lot# 91-2111) was transfered to the two LSC vials (631/24) with a Repipet Dispenser. The vials were then swirled and stored in the RAD hood in Lab 106 Bldg 57.

Swirling and storing of tubes

Test tubes AL1-Np-1 through AL1-Np-6 were swirled for 1 min each. Then placed on the gyratory shaker (~120 rpm) with their caps loosened. They will be allowed to equilibrate with the atmosphere for ~10 days. Samples will be swirled every couple of days and have their caps removed for ~20 min to allow equilibrium with atmosphere.

20 Oct 04 AB

Labeling of LSC vials

For each sample solution (AL1-Np-1 through AL1-Np-6) two 7 mL Liquid Scintillation (LSC) vials were labeled on their caps (e.g., AL1-Np-1a and AL1-Np-1b). A total of 12 LSC vials were labeled

Adding 0.5 mL of 0.02 M HNO_3 to LSC vials

0.5 mL of 0.02 M HNO_3 (631/23) was transfered into each of the 12 LSC vials with a 500 uL eppendorf pipet. The LSC vials + HNO_3 weights are recorded on 631/26.

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Weighing of LSC vials + HNO_3

The 12 LSC vials were placed on the Mettler AE 240 scale (S/N 101237) weighed and recorded on the table below.
Initial calibration check of scale (Target 20.0001g) reading 20.0000g
Final calibration check of scale (Target 20.0001g) reading 20.0001g

Sample ID	Weight of 7 ml LSC vial plus 0.5 ml of 0.02 M HNO3 (g)	Weight of vial with 0.5 ml of sample solution added (g)
AL1-Np-1a	7.8441	8.3411
AL1-Np-1b	7.9132	8.4124
AL1-Np-2a	7.8967	8.3929
AL1-Np-2b	7.9064	8.4059
AL1-Np-3a	7.9895	8.4886
AL1-Np-3b	7.8739	8.3729
AL1-Np-4a	7.9169	8.4150
AL1-Np-4b	7.9879	8.4863
AL1-Np-5a	7.9375	8.4367
AL1-Np-5b	7.9481	8.4467
AL1-Np-6a	7.8804	8.3775
AL1-Np-6b	7.8981	8.3965

Creation of a Blank

A 7ml LSC vial was labeled Blank. 0.5 ml of 0.02 M HNO_3 and 0.5 ml of ground water sample (NC-EHDP-19PB-SHAL-0504-FUA-2) was transferred into the vial with a 500 ml eppendorf pipet.

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Weighing of each sample test tube

The six test tubes (631/22) with alluvium groundwater + Np spike were reweighed on the Mettler AE 240 scale (S/N 101237). Weight taken to determine amount of H_2O lost to evaporation. A 30 ml glass beaker was placed on the scale and tared. The test tubes were placed in the beaker for stability while being weighed. Weights recorded on the table below.

	Weight of tube before sampling (g)	Weight of tube after sampling (g)
AL1-Np-1	52.3961	51.4011
AL1-Np-2	52.5574	51.5648
AL1-Np-3	52.5665	51.5696
AL1-Np-4	52.8585	51.8631
AL1-Np-5	52.4366	51.4403
AL1-Np-6	52.6884	51.6942
	Weight of tube after sample withdrawn for pH measurement (g)	
AL1-Np-1		
AL1-Np-2		
AL1-Np-3		
AL1-Np-4		
AL1-Np-5		
AL1-Np-6		

10-20-04 [illegible]

Aliquot transfer from test tube to LSC vial

A 0.5 ml aliquot was transferred ~~from~~ 10-20-04 into the appropriate 7 ml LSC vial from the corresponding test tube (631/27). Samples were taken with a 500 ~~ml~~ 10-20-04 eppendorf pipet. Two aliquots removed from each of the 6 test tube solns.

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Weighing of LSC vials and Test tubes

LSC vials (631/26) ~~and test tubes~~ 10-20-04 weighed after addition of HNO_3 and aliquot from test tubes. The 6 test tubes (631/27) were reweighed after aliquot taken. The LSC vials and test tubes were weighed on the Mettler AE 240 scale (S/N 101237). Data recorded on 631/26 + 27.
Initial calibration check (target 20.0001g) reading 20.0002g
Final calibration check reading 20.0001g

Addition of cocktail to LSC vials

The 12, 7 mL LSC vials (631/26) and the Blank LSC vial (631/26) ~~[illegible]~~ 10-20-04 [illegible] had 5 mL of ULTIMA GOLD AB (lot # 6013309, lot #91-2511) added to them by a Repipetter. After the cocktail was added the samples were mixed and set aside for counting. Samples stored in Liquid Scintillation analyzer.

Measuring pH of Test tubes

pH meter: Orion model 930A (S/N 039518)
probe: Thermo Orion 8103 BN

Calibration with two standards Fisher Buffer Soln pH 7.02 (Lot # 041088-24, SB108-500) and pH 10.06 (lot # 033031-24, SB116-500). Temperature was 21.0°C. Slope of calibration was 100.1 (acceptable range is 92-102%)
Readings of 7 test tube samples (631/22) recorded on 631/29.

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Sample ID	pH
ALI-Np-1	8.53
ALI-Np-2	8.54
ALI-Np-3	8.54
ALI-Np-4	8.55
ALI-Np-5	8.54
ALI-Np-6	8.52
ALI-Np-Avg	0.77

Final calibration check with pH 7.02 Buffer soln reading = 7.03.

22 Oct. 04 [illegible]

Testing of Np spike

Two, 7 mL ~~LS~~ 10-22-04 [illegible] Liquid Scintillation (LSC) vials were labled Spike 46A 1 and 2.
Each LSC tube had 0.5 mL of 0.02 M HNO_3 (631/23) added by a 500 µL eppendorf pipet.
The samples were then weighed on the Mettler AE240 scale ~~(S/N)~~ 10-22-04 (S/N 101237). Recorded below.
Initial calibration check (Target 20.0001g) reading 20.0001g
Final calibration check (Target 20.0001g) reading 20.0001g

Sample ID	Weight of Vial + acid (g)	Weight (g) of vial + acid + spike
Spike 46A-1	7.9101	8.0110
Spike 46A-2	7.8480	7.9488

Next 100 µL of Np spike 46A (556/84) was added with a 100 µL eppendorf pipet to each of the LSC vials.

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22 Oct. 04 cont. [illegible]

After spike added the samples were reweighed and recorded on G31/29. Samples weighed on mettler AE 240 scale (SN 101237).
5 mL of ULTIMA GOLD AB (cat# G013309, lot# 91-2111) was added to each of the LSC vials with a Repipetter. Samples mixed by hand after cocktail added and set inside RAP hood.

10 Nov. 04 [illegible]

Np sorption on alluvium from drillhole NC-EWDP-19PB in 60mL square bottles

Jon Brown will be preforming this experiment.
Objective: To investigate Np sorption on alluvium from drillhole NC-EWDP-19PB
Conditions: $\Sigma Np = 200$ ppb
equilibrium with atmospheric $CO_2(g)$; $pCO_2 = 10^{-3.5}$
solution volume = 30 mL
M/V = 16.7

Equipment: Orion 920A pH meter and ~~[illegible]~~ 11-10-04 combination pH electrode
Gyratory shaker
~~Fisher~~ 11-10-04
Mettler PR5002 and AE240 balances
Packard 2500 TR/AB LSC
Eppendorf micropipettes and tips
Oxford pipettes and tips
Repipetter for transfer of scintillation cocktail
Supplies: Alluvium sample NC-EWDP-19PB 406.3 ft depth interval (< 35 mesh size fraction)
Np spike 46A (60 ppm ^{237}Np stock solution; pH 5.85)

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10 Nov. 04 cont. [illegible]

Supplies: Filtered, unacidified water collected from NC-EWDP-19PB; sample NC-EWDP-19PB-SHAL-0504-FUA-2
Polycarbonate square bottles with caps (60ml capacity)
pH buffer solutions
Ultimate-Gold liquid scintillation cocktail
7 ml scintillation vials
concentrated HNO_3
50/50 v/v HNO_3
0.02 M HNO_3
weighing paper/boats
deionized ultrapure water, $DI H_2O$
plastic ware and glassware as needed
Filter size 0.45 nm

Calibration of pH meter

meter: Orion model 920A (SN 039518)
probe: Thermo Orion 8103BN
Fisher Buffer soln 7.02 (lot #041088-24) and 10.0 (lot # 033031-24)

Two buffer calibration points were used 7.02 and 10.06 pH. Temperature was 18.6 °C. The slope of the calibration was 99.8% (Target of exceptable slope is 92-102%).

A 10 mL sample of NC-EWDP-19PB-SHAL-0504-FUA-2 was removed with an oxford Macro pipett and placed into a small plastic beaker for pH measurement. A stickar was added and sample placed on stir plate.

pH reading of sample = 8.52

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From Page No.___ 10 Nov. 04 cont. 11-10-04 [illegible] [illegible]

Labeling and weighing of beakers

Six polycarbonate square beakers with caps (160 ml capacity) that had been acid washed were labeled AL2-Np-1 through 6.

Beakers weighed on the Mettler AE 240 scale (S/N 101237) with caps after labeled. Inital calibration check (Target 20.0001g) reading 20.0001g.
Final calibration check reading 20.0001g.
Heights recorded in table below.

Sample ID	Weight (g) of empty tube	Weight (g) of tube after addition of alluvium
AL2-Np-1	20.1610	20.6626
AL2-Np-2	20.3076	20.8106
AL2-Np-3	20.1727	20.6757
AL2-Np-4	20.1627	20.6650
AL2-Np-5	20.2544	20.7567
AL2-Np-6	20.2395	20.7418

Adding alluvium to beakers and weighing

Alluvium sample (NL-EMDP-19PB-406.3-407.5 <#35 mesh A) transferred into each of the 6 PC beakers with a spatula. About 0.5g ± 0.001g alluvium transferred into each of the beakers (AL2-Np-1 through 6). The Mettler AE240 scale (S/N 101237) was used to weigh samples. Heights recorded on table above.

11-10-04 [illegible]

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From Page No.___ 10 Nov. 04 cont. [illegible]

Addition of groundwater samples to beakers for Np + Alluvium sorption experiment

About 30 ml of NL-EMDP-19PB-SHAL-0504-FWA-2 groundwater sample transferred to each of the 6 PC beakers with alluvium already in them (631/32), with an oxford micro pipett 10 ml at a time. After addition of groundwater sample, beakers weighed on Mettler AE 240 (S/N 101237) and recorded on table below.
Inital calibration checks of scale (Target 20.0001g) reading 20.0001g
Final calibration check of scale reading 20.0001g

Sample ID	Weight (g) of tube after addition of solution
AL2-Np-1	51.1195
AL2-Np-2	51.2714
AL2-Np-3	51.1500
AL2-Np-4	51.0735
AL2-Np-5	50.9933
AL2-Np-6	50.9222

12 Nov 04 [illegible]

Adding Np spike to beakers with alluvium and soln. Weighing of beakers

Each of the 6 beakers with solution (groundwater) and alluvium samples were weighed after 2 days of equilibrium with the atmosphere. The Mettler AE 240 scale (S/N 101237) was used to weigh samples.
Inital calibration check of scale (Target 20.0001g) reading 19.9998g
Final calibration check of scale (Target 20.0001g) reading 19.9998g
Results recorded on table (631/34).

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From Page No.____ 12 Nov 04 cont. [initials]

Sample ID	Weight (g) of tube after solid/soln equilibrium (about 3 days)	Weight (g) of tube after Np Spike added
AL2-Np-1	50.9880	51.7019
AL2-Np-2	51.1303	51.8415
AL2-Np-3	51.0725	51.7851
AL2-Np-4	50.9521	51.6655
AL2-Np-5	50.9437	51.6561
AL2-Np-6	50.8575	51.5694

Addition of Np spike

Spike: 46A 237 Np ~60 ppm (556/84)

About ~~100~~ 700 11-19-04 [initials] µL of Np spike transfered into each of the 6 beakers (631/34) with an Eppendorf pipett (100 µL). This should produce Np concentrations of ~200 ppb.

After ~~sample~~ 11-12-04 [initials] Np spike added samples were reweighed and recorded on table above. Inital calibration check of scale (Target 20.0001g) reading 19.9999g. Final calibration check reading = 19.9998g.

16 Nov. 04 [initials]

Labeling of LSC vials

For each sample solution (AL2-Np-1 through AL2-Np-6) two 7 mL Liquid Scintillation (LSC) vials were labeled on their caps (eg AL2-Np-1a and AL2-Np-1b). A total of 12 LSC vials were labeled.

Adding 0.5 mL of ~~0.0M~~ 11-16-04 [initials] 0.02 M HNO_3 to LSC vials

0.5 mL of 0.02 M HNO_3 (631/23) was transfered into each of the 12 LSC vials with a 500 µL eppendorf pipett.

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From Page No.____ 16 Nov. 04 cont. [initials]

Weighing of LSC vials + HNO_3

The 12 LSC vials were then placed on the Mettler AE 240 scale (S/N 101237) weighed and recorded on the table below.
Inital calibration check of scale (Target 20.0001g) reading 20.0000g
Final calibration check of scale (Target 20.0001g) reading 20.0000g

Sample ID	Weight (g) of 7 mL LSC vial plus 0.5 ml of 0.02 M HNO_3	Weight (g) of vial with 0.5 ml of sample solution added
AL2-Np-1a	7.8565	8.3567
AL2-Np-1b	7.9267	8.4290
AL2-Np-2a	7.9313	8.4323
AL2-Np-2b	7.8727	8.3756
AL2-Np-3a	7.9126	8.4055
AL2-Np-3b	7.9510	8.4362
AL2-Np-4a	7.9620	8.4580
AL2-Np-4b	7.8972	8.3958
AL2-Np-5a	7.9054	8.3997
AL2-Np-5b	7.9181	8.4151
AL2-Np-6a	7.8597	8.3523
AL2-Np-6b	7.8267	8.3231

Creation of a Blank

A 7 mL LSC vial was labled Blank. 0.5 mL of 0.02 M HNO_3 and 0.5 mL of ground water sample NC-EWDP-19PB-SHAL-0504-FUA-2) was transfered into the vial with a 500 µL eppendorf pipett. Weight of Blank ~~sample~~ 11-16-04 [initials] LSC vial with 0.5 mL of 0.02 M HNO_3 is 7.8876 g. Weight of "Blank" vial with 0.5 ml of ground water added equals 8.3934 g.

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From Page No.___ 16 Nov. 04 cont. [illegible]

Weighing of each sample beaker

The 6 sample beakers (631/34) with alluvium + groundwater + spike were reweighed on the Mettler AE 240 scale (S/N 101237). Weight taken to determine the amount of H_2O lost to evaporation. Weights recorded below.

Sample ID	Weight (g) og tube before sampling	Weight of tube after sampling
AL2-Np-1	51.6780	50.6756
AL2-Np-2	51.8134	50.8102
AL2-Np-3	51.7569	50.7783
AL2-Np-4	51.6392	50.6447
AL2-Np-5	51.6275	50.6365
AL2-Np-6	51.5338	50.5454

Aliquot transfer from beaker to LSC vials

A 0.5 ml aliquot was transfered into the appropriate 7 ml LSC vial from the corresponding beaker (631/36). Samples were taken with a 500 ul eppendorf pipett. A total of two aliquots removed from each of the 6 beakers.

Weighing of LSC vials and Beakers

LSC vials (631/35) weighed after the addition of HNO_3 and aliquot (0.5 ml) from beakers. The 6 Beakers (631/36) were reweighed after aliquots taken and recorded in table above. The LSC vial weights were recorded on 631/35. The Mettler AE 240 scale (S/N 101237) was used to determine weight. Initial calibration check of scale (Target 20.0001g) reading = 20.0000g. Final calibration check = 20.0001g.

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Addition of cocktail to LSC vials

The 12, 7 ml ~~vial~~ 11-16-04 LSC vials (631/35) and the Blank (631/35) LSC vial ~~bad~~ 11-16-04 had 5 ml of ULTIMA GOLD AB (cat # 6013309, lot # 91-211) added to them by a Repipetter. After the cocktail was added the samples were mixed by hand and set aside for counting.

Testing of Np Spike

Two, 7 ml LSC vials were labeled Spike 46A-3 and Spike 46A-4. Each LSC vial had 0.5 ml of 0.02 M HNO_3 (631/23) added by a 500 ul pipett. The samples were then weighed on the Mettler AE 240 scale (S/N 101237) and recorded below.
Initial calibration check of scale (Target 20.0001g) reading 20.0000g
Final calibration check of scale (Target 20.0001g) reading 20.0000g

Sample ID	Weight of vial + acid (g)	Weight (g) of vial + acid + spike
Spike 46A-3	~~7.9285~~ 11-16-04 7.9678	8.0132
Spike 46A-4	7.9140	7.9651

Next 50 ul of Np Spike 46A (556/84) was added with a 10-100 ul eppendorf Reference ~~pipet~~ ~~pipetter~~ 11-16-04 pipetter into each of the LSC vials. After spike added the samples were reweighed and recorded in table above. 5 ml of ULTIMA GOLD AB (cat # 6013309, lot # 91-211) was added to each of the LSC vials with a Repipetter. Samples mixed by hand.

A third sample was created, but not used. It contains the same volumes as above and is labled Spike 46A-3b.

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From Page No. 16 Nov. 04 cont. JB

Measuring pH of soln in beakers for Np + Alluvium sorption experiment

pH meter: Orion model 920A (SN035518)
probe: Thermo Orion 8103 BN

Calibration with two standards Fisher Buffer soln pH 7.02 (lot # 041088-24, SB108-500) and pH 10.06 (lot # 033031-24, SB116-500). Temperature was 19.8°C. Slope of the calibration was 99.8% (acceptable slope range is 92-102%).
Readings of 6 Beaker pH's recorded below.

Sample ID	pH
AL2-Np-1	8.00
AL2-Np-2	8.12
AL2-Np-3	8.22
AL2-Np-4	8.08
AL2-Np5	8.21
AL2-Np-6	8.31

Final calibration check of pH reading with pH Buffer soln 7.02, reading = 7.04.

19 Nov. 04 JB

Analysis results of Np + Alluvium sorption experimental solutions (AL1)

The 15 Np + alluvium sorption experimental solutions (including the blank) and two spike solutions 631/26, 24, 29 were analysed on the Packard TRI-CARB 3100TR Liquid Scintillation Analyzer (model # A3100, SN 405314). The results point offs are on 631/39.

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From Page No. 19 Nov. 04 cont. JB

10/22/04 11:44:20 AM QuantaSmart (TM) - 1.31 - Serial# 405314 Page # 2
Protocol# 15 - Pa_Np_Exp_AB.lsa User: Bertetti

3H Background CPM (0-18.6 keV): 15.72 Date Processed: 10/20/04 5:06:41 PM
14C Background CPM (0-156 keV): 22.95 Date Processed: 10/20/04 5:06:41 PM
3H Calibration DPM: 285000
3H Reference Date: 10/29/99
14C Calibration DPM: 134100

Cycle 1 Results

Sample ID	S#	Count Time	CPMA	A:2S%	CPMB	B:2S%	CPMa	alpha2S%	SIS
MESSAGES									
Blank	1	240.00	21.18	2.81	2.89	7.60	0.46	19.07	137.7
	B								
AL1-Np-1a	2	81.16	1.10	*****	0.65	72.70	122.77	2.01	512.6
1b	3	83.11	1.16	*****	0.89	53.84	119.86	2.01	659.8
2a	4	80.47	0.61	*****	0.83	58.26	123.84	2.01	*****
2b	5	80.89	0.48	*****	0.99	49.28	123.18	2.01	*****
3a	6	82.15	1.59	76.11	1.37	36.82	121.28	2.01	560.9
3b	7	80.75	1.45	83.70	0.74	64.42	123.41	2.01	492.7
4a	8	82.18	1.21	98.87	1.19	41.76	121.26	2.01	739.9
4b	9	81.70	1.43	84.37	1.73	30.31	121.94	2.01	881.6
5a	10	80.62	3.06	40.73	1.64	31.85	123.61	2.01	398.9
5b	11	81.72	2.88	42.91	1.48	34.56	121.91	2.01	396.0
6a	12	82.54	2.86	43.05	2.09	25.72	120.71	2.01	603.3
6b	13	83.22	2.49	49.12	1.57	32.62	119.73	2.01	471.1
AL1-Np-INp-a	14	75.25	52.95	3.91	20.12	5.60	132.45	2.01	268.4
AL1-Np-INp-b	15	75.02	58.76	3.66	22.33	5.28	132.84	2.01	271.1

10/22/04 7:29:42 PM QuantaSmart (TM) - 1.31 - Serial# 405314 Page # 2
Protocol# 15 - Pa_Np_Exp_AB.lsa User: Bertetti

3H Background CPM (0-18.6 keV): 15.45 Date Processed: 10/22/04 3:20:32 PM
14C Background CPM (0-156 keV): 22.67 Date Processed: 10/22/04 3:20:32 PM
3H Calibration DPM: 285000
3H Reference Date: 10/29/99
14C Calibration DPM: 134100

Cycle 1 Results

Sample ID	S#	Count Time	CPMA	A:2S%	CPMB	B:2S%	CPMa	alpha2S%	SIS
MESSAGES									
	1	240.00	20.01	2.89	2.90	7.59	0.47	18.73	148.1
	B								
Spike 46A-1	2	1.14	4393.15	2.83	1860.26	4.35	8795.14	2.00	304.3
Spike 46A-2	3	1.12	6296.95	2.39	2648.00	3.67	9020.06	1.99	298.2

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From Page No.___ 19 Nov. 04 cont. [illegible]

Analysis results of Np + Alluvium experimental solutions, sorption experiment (AL2)

The 15 Np + Alluvium sorption experimental solutions (including the blank) (631/35) and two spike solns 631/37 were analysed on the Packard TRI-CARB 3100TR liquid Scintillation Analyser (model # 43100, S/N 405314). Results printoffs pasted below.

11/17/04 10:01:00 PM QuantaSmart (TM) - 1.31 - Serial# 405314 Page # 2
Protocol# 15 - Pa_Np_Exp_AB.lsa User: Bertetti

3H Background CPM (0-18.6 keV): 14.85 Date Processed: 11/17/04 3:30:27 PM
14C Background CPM (0-156 keV): 21.28 Date Processed: 11/17/04 3:30:27 PM
3H Calibration DPM: 285000
3H Reference Date: 10/29/99
14C Calibration DPM: 134100

Cycle 1 Results

Sample ID	S#	Count Time	CPMA	A:2S%	CPMB	B:2S%	CPMa	alpha2S%	SIS
MESSAGES									
Blank	1	240.00	19.87	2.90	2.96	7.50	0.42	19.80	152.9
B									
AL2-Np-1a	2	11.17	34.65	12.86	13.33	18.20	895.19	2.00	262.8
1b	3	11.14	38.30	12.03	17.59	15.49	898.05	2.00	303.5
2a	4	11.18	40.24	11.61	18.86	14.86	894.48	2.00	316.8
2b	5	10.82	47.69	10.55	17.92	15.55	925.36	2.00	277.3
3a	6	11.26	38.13	12.00	15.07	16.86	888.56	2.00	265.2
3b	7	11.63	34.73	12.59	15.27	16.47	859.51	2.00	302.7
4a	8	11.04	37.38	12.28	15.33	16.85	905.55	2.00	272.2
4b	9	11.16	39.45	11.78	15.23	16.83	896.08	2.00	291.3
5a	10	11.01	37.08	12.36	16.75	16.03	908.20	2.00	298.0
5b	11	11.06	37.82	12.17	16.02	16.41	904.37	2.00	290.0
6a	12	11.33	53.83	9.54	19.90	14.32	882.63	2.00	270.4
6b	13	11.10	47.79	10.40	20.91	14.07	901.38	2.00	301.0
Spike 46A-3	14	2.25	2958.36	2.46	1209.04	3.84	4448.91	2.00	294.9
Spike 46A-4	15	2.22	3105.81	2.42	1288.03	3.74	4517.59	2.00	299.2

11-19-04 [illegible]

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From Page No.___ 19 Nov. 04 cont. [illegible]

Np sorption on alluvium from drillhole NC-EWDP-19PB in 60 mL square bottles

Same materials, conditions, equipment and supplies used as listed on 631/30-31.

Calibration of pH meter + measuring groundwater pH

meter: Orion model 920A (S/N 039518)
probe: Thermo Orion 8103 BN
Fisher Buffer soln 7.02 (lot# 041088-24) and pH 10.0 (lot# 033031-24)

Two buffer calibration points were used, 7.02 and 10.06 pH. The temperature was 20.3°C. The slope of the calibration was 99.5% (Target of acceptable slope is 92-102%).

A 10 mL sample of NC-EWDP-19PB-SHAL-0504-FILA-2 was compied with an Oxford Macro pipett and placed into a small plastic beaker for pH measurement.

pH reading of sample = 8.55

Aliquot of alluvium (NC-EWDP-19PB 406.3-407.5 < #35 mesh, A) taken for thin section analysis (628/37-43)

A ~5.1 g aliquot of NC-EWDP-19PB 406.3-407.5 < #35 mesh A was taken with a spatula and placed in a 5 DR plastic container. Sample will be sent out for thin section analysis. Sample labeled NC-EWDP-19PB 406.3-407.5 < #35 mesh A, Thin section.

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From Page No.___ 19 Nov. 04 cont. JB

Labeling and weighing of Beakers

Six polycarbonate square beakers with caps (60 mL) that had been washed with 10% Nitric acid and rinsed with DI water were labled AL3-Np-1 through 6.

Beakers weighed on the Mettler AE240 scale (S/N 101237) with caps after labled. Inital calibration check of scale (Target 20.0001g), reading = 20.0001g
Final calibration check reading = 20.0000g
Weights recorded in table below.

Sample ID	Weight (g) of empty tube	Weight (g) of tube after addition of alluvium
AL3-Np-1	20.2664	20.7704
AL3-Np-2	20.2285	20.7381
AL3-Np-3	20.4219	20.9285
AL3-Np-4	20.2247	20.7303
AL3-Np-5	20.1793	20.6845
AL3-Np-6	20.2585	20.7638

Adding alluvium to beakers and weighing

About 0.5g ± 0.001g of alluvium (NC-EHDP-1995 406.3-407.5 <# 35 mesh A) was transferred into each of the 6 PC beakers with a spatula. 11-19-04 JB AL3Np (AL3-Np-1 through 6). The Mettler AE240 scale (SN 101237) was used to weigh sample. Weights recorded above. Challenge of scale after measurements (Target 20.0001g) reading = 20.0001g

~~4-19-04 JB~~

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From Page No.___ 19 Nov. 04 cont. JB

Addition of groundwater samples to beakers for Np + Alluvium sorption experiment

About 30mL of NC-EHDP-1995-SHAL-0504-FWA-2 groundwater sample was transferred into each of the 6 PC beakers with alluvium already in them (631/42), with an Oxford Macro pipett, 10mL at a time.
After addition of groundwater sample, beakers were weighed on Mettler AE 240 scale (S/N 101237) and recorded on table below. Inital calibration check of scale (Target 20.0001g) reading = 20.0001g
Final calibration check of scale, reading = 20.0000g

Sample ID	Weight (g) of tube after addition of solution
AL3-Np-1	51.4380
AL3-Np-2	51.3584
AL3-Np-3	51.5459
AL3-Np-4	51.0138
AL3-Np-5	50.8477
AL3-Np-6	51.1951

Samples placed in gyratory shaker with caps loosly placed on to allow air transfer.

22 Nov. 04 JB

Adding Np spike to beakers with alluvium and groundwater, weighing of beakers

Each of the 6 beakers with solution (groundwater) and alluvium samples were weighed after 3 days of equilibrium with the atmosphere. The Mettler AE240 scale (S/N 101237) was used to weigh samples.

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From Page No.___ 22 Nov. 04 cont. AB

Initial calibration of scale (Target reading = 20.0001g) reading = 20.0000g. Final calibration check of scale reading = 20.0001g (check 11-22-04 AB)

Sample ID	Weight (g) of tube after solid/soln equilibrium (about 3 days)	Weight (g) of tube after Np Spike added
AL3-Np-1	51.3808	51.4782
AL3-Np-2	51.3233	51.4213
AL3-Np-3	51.5094	51.6083
AL3-Np-4	50.9731	51.0708
AL3-Np-5	50.7993	50.8968
AL3-Np-6	51.0792	51.1779

Addition of Np Spike

Spike: 46A 237Np, ~60 ppm (556/84)

About 100 µl of Np spike transfered into each of the 6 beakers (63/44) with a 100 µl eppendorf pipett. This should produce Np concentrations of ~200 ppb.

After Np spike added samples were reweighed and recorded on table above. Final calibration check of scale (Target reading = 20.0001g) reading = 20.0001g.

30 Nov. 04 AB

Labeling of LSC vials

For each sample solution (AL3-Np-1 through AL3-Np-6) two 7mL Liquid Scintillation (LSC) vials were labeled on their caps (e.g. AL3-Np-1a and AL3-Np-1b). A total of 12 LSC vials were labled.

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From Page No.___ 30 Nov. 04 cont. AB

Creation of 0.02 M HNO_3

~~0.125 mL~~ (11-30-04 AB) of 0.127 mL of 15.8 M HNO_3 (Fisher A200-212, Lot # 040708) was transfered into a 100 mL volumetric flask and filled to the line with DI water. Acid transfered with an adjustable eppendorf pipett.

Adding 0.5 mL of 0.02 M HNO_3 to LSC vials

0.5 mL of 0.02 M HNO_3 (631/45) was transfered into each of the 12 LSC vials with a 500 µl eppendorf pipett.

Weighing of LSC vials + HNO_3

The 12 LSC vials were then weighed on the Mettler AE 240 scale (SN 101237) and recorded on the table below.
Initial calibration check of scale (Target 20.0001g) reading = 19.9998g, Final reading = 19.9997g

Sample ID	Weight (g) of 7 mL LSC vial plus 0.5 ml of 0.02 M HNO_3	Weight (g) of vial with 0.5 ml of sample solution added
AL3-Np-1a	7.8889	8.3843
AL3-Np-1b	7.8738	8.3712
AL3-Np-2a	7.9255	8.4204
AL3-Np-2b	7.9001	8.3970
AL3-Np-3a	7.7845	8.2807
AL3-Np-3b	7.8336	8.3310
AL3-Np-4a	7.8808	8.3752
AL3-Np-4b	7.8428	8.3401
AL3-Np-5a	7.8845	8.3788
AL3-Np-5b	7.8052	8.3021
AL3-Np-6a	8.0000	8.4924
AL3-Np-6b	7.8297	8.3273

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[Creation of a Blank]

A 7 mL LSC vial was labled Blank. 0.5 mL of 0.02 M HNO_3 and 0.5 mL of groundwater sample (WC-EMDP-19PB-SHAL-0504-FILA-2) was transfered into the vial with a 500 uL eppendorf pipett. Height of Blank LSC vial with 0.5 mL of 0.02 M HNO_3 was 7.9353 g. Height of Blank LSC vial with 0.5 mL of groundwater added is 8.4311 g. Measurements taken on the Mettler AE240 scale (S/N 101237).

[Weighing of each sample beaker]

The 6 sample beakers (631/44) with alluvium + groundwater + spike were reweighed on the Mettler AE240 (S/N 101237) scale. Height taken to determine amount of H_2O lost to evaporation. weights recorded below. Initial calibration check of scale (target = 20.0000 g) reading 19.9998 g.

Sample ID	Weight (g) og tube before sampling	Weight of tube after sampling
1-30-04 JB AL3-Np-1	51.1384	50.1453
AL3-Np-2	50.8741	49.8799
AL3-Np-3	51.0441	50.0484
AL3-Np-4	50.5432	49.5489
AL3-Np-5	50.5820	49.5869
AL3-Np-6	50.8079	49.8197

Final calibration check reading = 19.9998 g.

[Aliquot transfer from beaker to LSC vials]

A 0.5 mL aliquot was transfered into the appropriate 7 mL LSC vial from the corresponding beaker (631/46). Samples were taken with a 500 uL eppendorf

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pipett. A total of 2 aliquots removed from each of the 6 beakers.

[Weighing of LSC vials and Beakers]

LSC vials (631/45) weighed after addition of HNO_3 and aliquot (0.5 mL) from beakers. The 6 beakers (631/46) were reweighed after aliquots taken and recorded on table above. The LSC vial weights recorded on (631/45). The Mettler AE240 scale (S/N 101237) was used to determine weights. Initial calibration check of scale (target 20.0000 g) reading = 19.9997 g, Final reading = 19.9997 g.

[Addition of cocktail to LSC vials]

The 12, 7 mL LSC vials (631/45) and the Blank (631/46) LSC vial had 5 mL of of ULTIMA GOLD AB (Lot # 6013309, Lot 91-211) added to them by a Repipetter. After the cocktail was added samples mixed by hand and set aside for counting.

[Measuring pH of soln in Beakers for Np+ Alluvium sorption experiment]

pH Meter: Orion model 920A (S/N 039518)
probe: Thermo Orion 8103 BN

Calibration with two standards Fisher Buffer soln pH 7.02 (lot # 041088-24, SB108-500) and pH 10.06 (lot # 033031-24, SB116-500). Temperature was 19.5°C. Slope of the calibration was 99.6 %. (acceptable slope range is 90-102 %) Readings of 6 Beaker pH's recorded on 631/48).

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Sample ID	pH
AL3-Np-1	8.57
AL3-Np-2	8.59
AL3-Np-3	8.58
AL3-Np-4	8.56
AL3-Np-5	8.58
AL3-Np-6	8.55

Final calibration check of pH reading with pH Buffer soln 7.02, reading = 7.06 at 19.6°C

3 Dec. 04 JB

Analysis results of Np + Alluvium experimental soln
Sorption Experiment AL3

The 12 Np + Alluvium sorption experimental soln's (631/45), Blank (631/46), and 2 spikes (631/37) were analysed on the Packard TRI-CARB 3100TR Liquid Scintillation Analyser (model # A3100, S/N 405314). ~~Results printoff below~~ 12-03-04 JB
Results printoff on 631/49.

12/3/04 JB

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From Page No. Dec. 3, 04 cont. JB

12/2/04 2:54:10 PM QuantaSmart (TM) - 1.31 - Serial# 405314 Page # 2
Protocol# 15 - Pa_Np_Exp_AB.lsa User: Bertetti

3H Background CPM (0-18.6 keV): 15.97 Date Processed: 12/1/04 5:34:16 PM
14C Background CPM (0-156 keV): 23.08 Date Processed: 12/1/04 5:34:16 PM
3H Calibration DPM: 285000
3H Reference Date: 10/29/99
14C Calibration DPM: 134100

Cycle 1 Results

Sample ID	S#	Count Time	CPMA	A:2S%	CPMB	B:2S%	CPMa	alpha2S%	SIS
MESSAGES									
Blank	1	240.00	21.20	2.80	2.93	7.54	0.35	21.82	140.2
B									
AL3-Np-1a	2	84.89	5.86	21.78	2.38	22.99	117.47	2.01	290.0
1b	3	85.14	8.95	14.86	3.29	17.75	117.12	2.01	265.7
2a	4	83.66	7.43	17.67	2.71	20.84	119.22	2.01	253.3
2b	5	84.38	7.56	17.33	2.91	19.62	118.19	2.01	285.2
3a	6	81.98	7.90	16.85	2.96	19.60	121.64	2.01	258.2
3b	7	82.58	9.65	14.08	3.46	17.30	120.76	2.01	256.3
4a	8	83.56	9.51	14.20	3.49	17.09	119.34	2.01	251.7
4b	9	84.34	8.28	15.99	4.00	15.36	118.22	2.01	323.9
5a	10	83.19	6.36	20.36	3.47	17.20	119.88	2.01	346.3
5b	11	82.58	8.52	15.72	3.00	19.33	120.76	2.01	259.9
6a	12	83.77	7.41	17.69	3.49	17.09	119.04	2.01	318.5
6b	13	83.85	7.43	17.64	3.07	18.88	118.91	2.01	286.5
Missing vial 14.									
Spike46A-3	15	2.24	3259.16	2.35	1316.71	3.69	4475.10	2.00	288.9
Spike46A-4	16	2.18	3471.46	2.31	1435.14	3.58	4596.44	2.00	297.4

23 Feb 05 JB

Creation of Reagent solution + Standards
For Inorganic Carbon Analysis of Simulated waters

Jon Brown will be preforming this task
Objective: Prepare Reagents and Stock soln
Equipment: Mettler AE 240 scale (SN 101237)
Stirrplate
Supplies: weigh boat
Deionized ultrapure water
1 L amber glass bottles
Sodium Carbonate (Lot# 006077) Fisher (S263)
98% Sodium Persulfate (Lot# B0104212) Acros (20102)
85% Phosphoric Acid (Lot# 001815) Fisher ~~(242-4)~~ 2/24/05 JB (A242-4)
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From Page No.____ 23 Feb. 05 cont. JB

Creation of Inorganic Carbon Standards

Target concentration for stock soln is 200 ppm inorganic carbon (IC) from sodium carbonate (SC).

Formula Weight of SC = 105.99 Na_2CO_3
Carbon = 12.011
For 1 Liter of 200 ppm IC, use 1.7648g of SC

Reagents - type 1 water
Sodium Carbonate = Fisher S263-500, Lot # 006077

Challenge balance at start (Target 20.0001g) reading = ~~20.0001~~ 2/23/05 JB 20.0002g
A weigh boat was tared on the Mettler AE 240 balance (SN 101232). The SC was slowly transferred with a spatula into the weigh boat. The final mass of the SC was 1.7649g.
Challenge of balance at end (Target 20.0001g) reading = 20.0002g

The SC was transferred into a clean 250 mL beaker with about 75 mL of type 1 water. The weigh boat was rinsed several times with type 1 water. The rinsate was also decanted into the beaker. The beaker was placed on a stir plate and a magnetic stir bar was added. The soln was stirred a few minutes. The beaker contents were decanted into a 1000 mL vol. flask. The beaker was rinsed several times with the rinsate transfered into the 1L vol flask. The flask was capped, inverted and swirled. Soln was transfered into a 1L amber glass bottle, labled ~~1000~~ 2/23/05 JB ~~ppm~~ 200 ppm IC.

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From Page No.____ 23 Feb. 05 cont. JB

Preparation of Inorganic Carbon calibration standards for IC analysis

Target 50 ppm Inorganic Carbon (IC) - added 25 mL (vol. pipet) of 200 ppm IC (631/50) into 100 mL vol. flask. Filled to mark with type 1 water.

Target 10 ppm IC, added 25 mL (vol. pipet) of 200 ppm IC (631/50) into 500 mL vol. flask. Fill to mark with type 1 water.

Target 1 ppm IC - added 50 mL of (vol. pipet) 10 ppm (631/51) into 500 mL vol. flask. Filled to mark with type 1 water.

Target 0.5 ppm IC - added 50 mL of (vol. pipet) 10 ppm (631/51) into a 500 mL vol. flask. Filled to mark with type 1 water.

~~Target 0.1 ppm~~ 2/23/05 JB
Target 5 ppm IC - added 50 mL of (vol. pipet) 10 ppm (631/51) into a 100 mL vol flask. Filled to mark with type 1 water.

Target 100 ppm IC - added 50 mL of (vol. pipet) 200 ppm (631/50) into a 100 mL vol flask filled to mark with type 1 water.

Standards stored in refrigerator in Lab 106, Bldg 57.

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From Page No. 24 FEB 05 BW

Continuation of Reagent Solution Preparation for Inorganic Carbon analyses of simulated waters

Initial entry 631/49
Additional equipment 250mL pc square bottle
10mL graduated cylinder
100mL graduated cylinder
500mL graduated cylinder
spatula, 500mL pc square bottle

— Sodium Persulfate Solution. BW 2-24-05
Target conc. 10% persulfate + 5% ~~perct~~ phosphoric
Procedure from Phoenix 8000 User Manual - Section 3.3

A weighing boat was tared on the Mettler AE 240 balance (SN 101237). The sodium persulfate was carefully transferred into the weigh boat.

Challange of Balance (target) 20.0001g mass
At start = 20.0000 g
At finish = 20.0000 g
Mass (g) of Sodium Persulfate = 25.0037

The sodium persulfate was transferred into a 250mL pc square bottle. 213mL (500mL grad cylinder) of type 1 water was added. Some of this water was used to rinse weigh boat with rinsate added to bottle. 9mL (10mL grad cylinder) of phosphoric acid was added. Labeled Sodium Persulfate solution

— 2.1% Phosphoric acid Solution
Procedure from Phoenix 8000 User Manual - Section 3.3

Added 376mL of type 1 water (500mL grad cylinder) to a 500mL pc square bottle. Added 74 mL

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(100mL grad cylinder) of phosphoric acid to the ~~for~~mentioned 500mL bottle. Labeled 21% phosphoric acid.

9 March 05 BB

Creation of Inorganic Carbon Standards

Target concentration for stock soln is 200 ppm inorganic carbon (IC) from sodium carbonate (SC)

Formula weight of SC = 105.99 Na_2CO_3
Carbon = 12.011

For 1 Liter of 200 ppm IC, use 1.7648g of SC

Reagents - Type 1 water
Sodium Carbonate = Fisher S263-500, Lot 006077

Challenge balance at start (Target 20.0001g) reading = 20.0001g
A weigh boat was tared on the Mettler AE 240 balance (SN 101237). The SC was slowly transferred with a spatula into the weighing boat. The final mass of the SC was 1.7647g
Challenge of balance at end (target 20.0001g) reading = 20.0000g

The SC was transferred into a clean 250 mL beaker with about 75 mL of type 1 water. The weigh boat was rinsed several times with type 1 water. The rinsate was also decanted into the beaker. The beaker was placed on a stir plate and a magnetic stir bar was added. The soln was stirred a few min. The beaker contents

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3/9/05 9 March 05 cont. JB

were decanted into a 1000 mL vol flask. The beaker was rinsed several times and decanted into the 1 L vol. flask. The 1 L vol flask was filled to the mark with type 1 water, capped, inverted and swirled. The soln was then transferred into a 1 L glass amber bottle labeled 200 ppm IC.

Preparation of Inorganic Carbon Calibration Standards for IC analysis

Target 100 ppm IC - added 50 mL of (vol. pipet) 200 ppm (631/53) into a 100 mL vol flask. Filled to the mark with type 1 water.

Target 50 ppm IC - added 25 mL of (vol. pipet) 200 ppm IC ~~into~~ 3/9/05 (631/53) into a 100 mL vol. flask. Filled to mark with type 1 water.

Target 10 ppm IC - added 25 mL (vol. pipet) of 200 ppm IC (631/53) into a 500 mL vol flask. Filled to mark with type 1 water.

Target 5 ppm IC - added 50 mL (vol. pipet) of 10 ppm IC (631/54) into a 100 mL vol. flask. Filled to mark with type 1 water.

Target 1 ppm IC - added 50 mL (vol. pipet) of 10 ppm (631/54) into a 500 mL vol. flask. Filled to mark with type 1 water.

Standards stored in refrigerator in lab 106 Bldg 57

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14 MAR 2005 BW

Collection of NC-EWDP-22PC Sonic Core Samples from the Sample Management Facility at the Nevada Test Site

Bradley Werling and Miriam Juckett traveled to the Sample Management Facility (SMF) at the Nevada Test Site (NTS) to collect sonic core samples

Objective: To collect sonic core samples from drillhole NC-EWDP-22PC for (1) characterization of material (alluvium) in the Forty Mile Wash area and (2) possible use in sorption experiments.

Supplies: Gallon size Ziplock bags
Polypropylene scoops (two sizes)
Large spatula
Latex gloves
Sharpies
Pens

Basic Outline of Procedure
- Quickly examine the length of core available for sampling
- Determine the size of the sections (5 ft, 10 ft, etc) to samples.
- Collect about 500 g of sample from each section
- Document information about colors, textures, etc as appropriate.

3-14-05 BW

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3/14/05 MRJ

Samples scooped from core samples and placed in ziplock bags labeled with name, date + depth of sample. The following were taken (noted by start/end depth)

Start depth (ft)	end depth (ft)	Notes
471.3	473.2	EF = 1.02
476.2	478.5	
480.0	481.8	
486.9	488.5	
492.7	494.6	EF = 1.23
497.7	499.3	
502.5	504.2	color variations - yellow & red
507.4	509.1	
512.4	515.3	
517.4	519.3	
522.1	524.4	EF in between = 1.17
529.8	531.6	
534.5	536.2	
539.2	540.8	gray coloration
540.8	542.4	
546.7	548.5	
550.2	551.8	color - more red EF = 1.08
555.3	556.8	
560.2	562.2	EF = 1.09
566.2	568.1	
571.3	574.0	
576.3	578.1	
580.6	583.0	
587.8	589.9	
595.0	596.6	EF = 1.29
600.5	602.0	
604.9	606.6	
609.3	611.0	
614.1	615.5	
618.5	620.5	
625.2	626.7	EF = 1.23

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Start depth (ft)	end depth (ft)	Notes
630.2	632.1	
636.7	637.9	gray "concretized"
640.3	641.6	
644.6	645.9	gray, similar to 2 previous to this, small and taken
647.1	648.4	EF in between = 1.55
653.1	654.5	MRJ 3/14/05
658.3	659.7	EF in between = 1.44
663.7	665.2	
670.5	672.0	EF in between = 1.34
675.9	678.1	
681.9	683.3	
686.1	688.1	
694.3	695.6	EF in between = 1.45
700.9	703.0	color variations within segment
706.1	709.8	
710.6	712.1	
715.0	717.1	
721.5	722.3	EF = 1.62
726.4	727.8	
734.8	736.4	red coloration EF = 1.64
740.5	742.0	
745.0	747.0	
747.4	748.8	brown coloration (moisture?)
753.2	754.9	
756.3	758.1	EF in between = 1.55
760.3	761.6	~~very wet~~ MRJ 3/14/05 very fine
461.3	462.9	
464.9	466.5	EF in between = 1.09

*"Information marker; Due to the nature of sonic coring and core recovery, depths were corrected to a factor of ____ to adjust for compaction or expansion of the alluvium."
EF = expansion factor noted at sample

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3-14-05 CONT BAW

~~SE~~ BW 3-14-05 Sonic Core borehole size changed at the 625.2 to 626.7 interval. Shallower samples (460.1 to 622.0) were 6 inches. Interval 622.0 to ~~65~~ BW 3-14-05 625.2 gone). Intervals 625.2 to 763.0 were 4 inches. At greater depths, equipment was unable to lift the larger 6 inch size cores, so the smaller 4 inch cores were used.

Sample left at SMF for removal approval and shipping to San Antonio by SMF personal. The point of contact at the SMF was Chris Lewis.

Two forms were filled out at the site: The sample examination authorization and the Specimen Removal Request. These were Office of Civilian Radioactive Waste Management forms. Copies were made and included on the following pages. Copies were also sent to NRC on-site rep Jack Parrot per his request. ALL work was performed at the SMF on Monday, 3-14-05.

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OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT QA:QA

SAMPLE EXAMINATION AUTHORIZATION

Requester Name	Organization	Phone
BRADLEY WERLING	CENTER FOR NUCLEAR WASTE REGULATORY ANALYSES	(210) 522-6565
Address	**Planning/Controlling Document**	**Date of Examination**
6220 CULEBRA RD SAN ANTONIO, TX 78238	ACL:HQO.19990811.0015	

The Yucca Mountain Project (YMP) geologic samples that have been provided for your examination at the Sample Management Facility (SMF) are controlled by the YMP Quality Assurance Program. The samples that are made available to you are for VISUAL EXAMINATION ONLY. NO DESTRUCTIVE ACTIONS OR SUBSAMPLING are to be performed. NO FOREIGN SUBSTANCES will be applied to these samples.

FOR NON-QUALITY AFFECTING SAMPLES

The responsibility to adequately identify and control data from non-quality affecting samples (Ltr: January 12, 1988, Gertz to Technical Project Officers, NNA.19880113.0007) is assigned to you, the examiner, as the representative of our organization.

I have read the above statements and will comply with sample examination restrictions and with directions to identify and control data from non-quality affecting samples.

Requester Signature Bradley Werling Date 3/14/05

SMF Authorization Chris Lewis Date CR 3/14/05 3/14/05

SAMPLES EXAMINED	SAMPLES EXAMINED
Source, Type, and Interval	Source, Type, and Interval
NC-EWDP-22PC, Core 460.0 to 763.0	

SMF USE ONLY — SMF Staff Member (Printed Name/Signature) _____ Date _____

AP-SII.1Q FORM NO. ASII1-1 (Rev. 06/11/2004)

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Witnessed & Understood by me, | Date | Invented by / Recorded by | Date

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OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT QA:QA

SAMPLE EXAMINATION AUTHORIZATION CONTINUATION

Requester Name	Organization	Date of Examination
BRADLEY WERLING	CENTER FOR NUCLEAR WASTE REGULATORY ANALYSES	

The Yucca Mountain Project (YMP) geologic samples that have been provided for your examination at the Sample Management Facility (SMF) are controlled by the YMP Quality Assurance Program. The samples that are made available to you are for VISUAL EXAMINATION ONLY. NO DESTRUCTIVE ACTIONS OR SUBSAMPLING are to be performed. NO FOREIGN SUBSTANCES will be applied to these samples.

FOR NON-QUALITY AFFECTING SAMPLES

The responsibility to adequately identify and control data from non-quality affecting samples (Ltr: January 12, 1988, Gertz to Technical Project Officers, NNA.19880113.0007) is assigned to you, the examiner, as the representative of our organization.

By signing below, I certify that I have read the above statements and will comply with sample examination restrictions and with directions to identify and control data from non-quality affecting samples.

Name	Signature	Organization
Miriam R. Juckett	Miriam R. Juckett	CNWRA/SwRI

SMF USE ONLY — SMF Staff Member (Printed Name/Signature) _____ Date _____

AP-SII.1Q FORM NO. ASII1-2 (Rev. 06/11/2004)

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Witnessed & Understood by me, | Date | Invented by | Date | Recorded by

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OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT QA: QA
SAMPLE OVERVIEW COMMITTEE Page 1 of ___

SPECIMEN REMOVAL REQUEST

Requester	Organization	Telephone	Date
BRADLEY WERLING	CENTER FOR NUCLEAR WASTE REGULATORY ANALYSES	(210) 522-6565	3/14/05

Address: 6220 CULEBRA RD SAN ANTONIO, TX 78238-5166

Planning/Controlling Document Number	Planning/Controlling Document Title
ACC: HQO.1999.0811.0015	

Test or Analysis to be Performed/Performed By

Grain size, petrographic analysis, XRD, surface area analyses, etc. All analyses will be performed by and under supervision of Center for Nuclear Waste Regulatory Analyses staff.

Comments/Directions Send samples to
BRADLEY WERLING (x6565)
CNWRA, Bldg 57
6220 Culebra Rd
San Antonio, TX 78238-5166
project # 20.06002.01.242

FOR NON-QUALITY AFFECTING SAMPLES

The responsibility to adequately identify and control data from non-quality affecting samples (Ltr: January 12, 1988, Gertz to Technical Project Officers, NNA.19880113.0007) is assigned to you, the examiner, as the representative of our organization. Each Affected Organization shall ensure that these data are not used for primary license data or entered into documents or systems which are to contain qualified data only.

Circle one: (A) Approved (D) Disapproved (T) Tabled
TCO Printed Name/Signature _____

Circle one: (A) Approved (D) Disapproved (T) Tabled
SMF Printed Name/Signature _____

Circle one: (A) Approved (D) Disapproved (T) Tabled
SOC Chairperson Printed Name/Signature _____ Date _____

AP-SII.2Q FORM NO. ASII2-1 (Rev. 06/11/2004)

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OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT
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SPECIMEN REMOVAL REQUEST CONTINUATION SHEET

Requester: BRADLEY WERLING
Date: 3/14/05
Planning/Controlling Document Number: ACC.HQO.19990811.0015
Planning/Controlling Document Title:

Specimen Source	Specimen Type	Interval	Amount	Substitution Acceptable/Remarks
NL-EWDP-22PC	Core	471.3-473.2	~500g or ~1.5cups	
		476.2-478.5		
		480.0-481.8		
		486.9-488.5		
		492.7-494.6		
		497.7-499.3		
		502.5-504.2		
		507.4-509.1		
		512.4-515.3		
		517.4-519.3		
		522.1-524.4		
		529.8-531.6		
		534.5-536.2		
		539.2-540.8		
		540.8-542.4		
		546.7-548.5		
		550.2-551.8		
		555.3-556.8		
		560.2-562.2		
		566.2-568.1		
		571.3-574.0		
		576.3-578.1		

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OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT
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SPECIMEN REMOVAL REQUEST CONTINUATION SHEET

Requester: BRADLEY WERLING
Date: 3/14/05
Planning/Controlling Document Number: ACC.HQO.19990811.0015
Planning/Controlling Document Title:

Specimen Source	Specimen Type	Interval	Amount	Substitution Acceptable/Remarks
NL-EWDP-22PC	Core	580.6-583.0	~500g or ~1.5cups	
		587.8-589.9		
		595.0-596.9		
		600.5-602.0		
		604.9-606.6		
		609.3-611.0		
		614.1-615.5		
		618.5-620.5		
		625.2-626.7		
		630.2-632.1		
		636.7-637.9		
		640.3-641.6		
		644.6-645.9		
		647.1-648.4		
		653.1-654.5		
		658.3-659.7		
		663.7-665.2		
		670.5-672.0		
		675.9-678.1		
		681.9-683.3		
		686.1-688.1		
		694.3-695.6		

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OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT
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Requester: BRADLEY WERLING
Date: 3/14/05
Planning/Controlling Document Number: ACC.HQD-19990811.0015
Planning/Controlling Document Title:

Specimen Source	Specimen Type	Interval	Amount	Substitution Acceptable/Remarks
NC-EWDP-22PC	Core	700.9-703.0	~500g or ~1.5 cups	
		706.1-707.8		
		710.6-712.1		
		715.0-717.1		
		721.5-722.3		
		726.4-727.8		
		734.8-736.4		
		740.5-742.0		
		745.0-747.0		
		747.4-748.8		
		753.2-754.9		
		756.3-758.1		
		760.3-761.6		
		461.3-462.9		
		464.9-466.5		

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Copy made for QA

18 April 05 MR

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From Page No. 18 April 05 MR

Receipt of NC-EWDP-22PC Sonic Core Samples

Personnel involved: Bradley Werling and Marla Roberts

Objectives: Document receipt of sonic core samples and take initial weight

Samples: Samples are comprised of sonic cores from NC-EWP-22PC and were collect at the Sample Management Facility (SMF): 631/55-64. Samples were sent to CNWRA after approval for specimen removal from the Office of Civilian Radioactive Waste Management (OCRWM). A total of 59 samples were collected. Samples were double bagged by OCRWM and shipped in 2 boxes. Although, both boxes arrived damaged, all samples were unaffected.

Equipment: Sartorius Balance - Model: 3808MPS-IV20, Serial Number: 39030006

Supplies: Ziploc bags

Basic Outline Procedure:

- Measure weight of empty Ziploc bag
- Measure weight of interior sample bag, including sample contents
- Record measurements
- Create legend to correlated OCRWM ID sample number with CNWRA ID number.

Empty Ziploc bag weight is 12.8g
Balance is tared for 12.8g, so all weigts reported are without the weight of the Ziploc bag. All wet samples will be oven dried and re-measured.
Chain of custody SMF Receipt from OCRWM samples - see 631/80-83

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Date Weighted	OCRWM ID Number:	CNWRA ID Number:	Initial Weight	~~Dried Weight~~ MR 21Apr05	date dry wgt MR 21Apr05
18 Apr 05 18 MR ~~11~~ Apr.05	01026614	NC-EWDP-22PC-0305-462.0-462.9	587.2g		
18 Apr.05	01026615	NC-EWDP-22PC-0305-464.9-466.5	736.3g		
18 Apr.05	01026616	NC-EWDP-22PC-0305-471.3-473.2	575.1g		
18 Apr.05	01026617	NC-EWDP-22PC-0305-476.9-478.5	545.7		
18 Apr.05	01026618	NC-EWDP-22PC-0305-480.0-481.8	538.2g		
18 Apr.05	01026619	NC-EWDP-22PC-0305-486.9-488.5	517.5g		
18 Apr.05	01026620	NC-EWDP-22PC-0305-492.7-493.8	557.1g		
18 Apr.05	01026621	NC-EWDP-22PC-0305-497.7-499.3	498.1g		
18 Apr.05	01026622	NC-EWDP-22PC-0305-502.5-504.2	642.0g		
18 Apr.05	01026623	NC-EWDP-22PC-0305-507.4-509.1	444.8g		
18 Apr.05	01026624	NC-EWDP-22PC-0305-513.3-515.3	664.4g		
18 Apr.05	01026625	NC-EWDP-22PC-0305-517.4-519.2	622.5g		
18 Apr.05	01026626	NC-EWDP-22PC-0305-522.1-523.5	551.9g		
18 Apr.05	01026627	NC-EWDP-22PC-0305-529.8-531.6	460.4g		
18 Apr.05	01026628	NC-EWDP-22PC-0305-534.5-536.2	631.2g		
18 Apr.05	01026629	NC-EWDP-22PC-0305-539.2-540.8	461.3g		
18 Apr.05	01026630	NC-EWDP-22PC-0305-540.8-542.4	551.1g		
18 Apr.05	01026631	NC-EWDP-22PC-0305-546.7-548.5	617.8g		
18 Apr.05	01026632	NC-EWDP-22PC-0305-550.2-551.8	664.8g		
18 Apr.05	01026633	NC-EWDP-22PC-0305-555.3-556.8	516.0g		
18 Apr.05	01026634	NC-EWDP-22PC-0305-560.6-562.2	672.6g		
18 Apr.05	01026635	NC-EWDP-22PC-0305-566.2-568.1	722.2g		
18 Apr.05	01026636	NC-EWDP-22PC-0305-571.3-573.0	513.7g		
18 Apr.05	01026637	NC-EWDP-22PC-0305-576.3-578.1	577.7g		
18 Apr 05	01026638	NC-EWDP-22PC-0305-580.6-581.9	641.1g		
18 Apr.05	01026639	NC-EWDP-22PC-0305-588.3-589.9	519.5g		
18 Apr.05	01026640	NC-EWDP-22PC-0305-595.0-596.6	501.0g		
18 Apr.05	01026641	NC-EWDP-22PC-0305-600.5-602.0	583.1g		
18 Apr.05	01026642	NC-EWDP-22PC-0305-604.9-606.3	543.4g		

Witnessed & Understood by me, | Date | Invented by | Date
Recorded by

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Date Weighted	OCRWM ID Number:	CNWRA ID Number:	Initial Weight	~~Dried Weight~~ 21 Apr 05 MR
18 Apr. 05	01026643	NC-EWDP-22PC-0305-610.1-611.0	625.0g	
18 Apr. 05	01026644	NC-EWDP-22PC-0305-614.1-615.5	589.9g	
18 Apr. 05	01026645	NC-EWDP-22PC-0305-618.5-620.5	714.3g ~~722.6g~~ MR ~~714.3g~~ MR 18 April 05	
18 Apr. 05	01026646	NC-EWDP-22PC-0305-625.2-626.7	658.2g ~~606.4g~~ MR 18 April 05	
18 Apr. 05	01026647	NC-EWDP-22PC-0305-630.2-631.9	598.0g ~~606.4g~~ MR 18 Apr. 05	
18 Apr. 05	01026648	NC-EWDP-22PC-0305-636.7-637.9	555.6g ~~564.2g~~ MR ~~555.6g~~ MR 18 Apr 05	
18 Apr. 05	01026649	NC-EWDP-22PC-0305-640.3-614.4	639.6g	
18 Apr. 05	01026650	NC-EWDP-22PC-0305-644.6-645.0	160.6g	
18 Apr. 05	01026651	NC-EWDP-22PC-0305-647.1-648.4	494.8g	
18 Apr. 05	01026652	NC-EWDP-22PC-0305-653.1-654.5	482.6g	
18 Apr. 05	01026653	NC-EWDP-22PC-0305-658.3-659.7	616.3g	
18 Apr. 05	01026654	NC-EWDP-22PC-0305-663.7-665.2	505.6g	
18 Apr. 05	01026655	NC-EWDP-22PC-0305-670.5-672.0	542.7g	
18 Apr. 05	01026656	NC-EWDP-22PC-0305-675.9-677.3	567.4g	
18 Apr. 05	01026657	NC-EWDP-22PC-0305-681.9-683.3	583.8g	
18 Apr. 05	01026658	NC-EWDP-22PC-0305-686.1-687.4	561.2g	
18 Apr. 05	01026659	NC-EWDP-22PC-0305-694.3-695.6	477.7g	
18 Apr. 05	01026660	NC-EWDP-22PC-0305-700.9-702.1	464.6g	
18 Apr. 05	01026661	NC-EWDP-22PC-0305-707.0-707.8	494.4g	
18 Apr. 05	01026662	NC-EWDP-22PC-0305-710.6-712.1	597.4g	
18 Apr. 05	01026663	NC-EWDP-22PC-0305-715.0-717.1	530.3g	
18 Apr. 05	01026664	NC-EWDP-22PC-0305-721.5-722.3	480.9g	
18 Apr. 05	01026665	NC-EWDP-22PC-0305-726.4-727.8	417.6g	
18 Apr. 05	01026666	NC-EWDP-22PC-0305-735.7-736.4	499.2g	
18 Apr. 05	01026667	NC-EWDP-22PC-0305-740.5-742.0	590.0g	
18 Apr. 05	01026668	NC-EWDP-22PC-0305-745.0-745.9	563.1g	
18 Apr. 05	01026669	NC-EWDP-22PC-0305-747.4-748.8	499.0g	
18 Apr. 05	01026670	NC-EWDP-22PC-0305-753.2-754.9	496.7g	
18 Apr. 05	01026671	NC-EWDP-22PC-0305-756.3-758.1	524.2g	
18 Apr. 05	01026672	NC-EWDP-22PC-0305-760.3-761.6	602.9g	

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From Page No. 18 April 05 MR cont.

Samples were dried using a Blue M Stabil-Therm oven. Model: B-2730-Q Serial: C-4850-Q. Only wet samples will be dried and re-weighed.

19 April 05 MR

Sieve Analysis of NC-EWDP-22PC Sonic Core Samples

Personnel involved: Marla Roberts

See revised initial entry 631/ ~~71-72~~ 72-73 21 April 05 MR

Objectives:

Samples: Samples are comprised of sonic cores from NC-EWP-22PC and were collect at the Sample Management Facility (SMF): 631/55-64. Samples were sent to CNWRA after approval for specimen removal from the Office of Civilian Radioactive Waste Management (OCRWM). A total of 59 samples were collected. Samples were double bagged by OCRWM and shipped in 2 boxes. Although, both boxes arrived damaged, all samples were unaffected.

Scientific Notebook Entry of collection procedures: 631/55-64
Scientific Notebook Entry for initial documentation and weight measurements: 631/66-69

Equipment: U.S.A. Standard Test Sieve, ATSM E-11 Specification, Fisher Company

- Mesh # 5 (4mm)
- Mesh # 10 (2mm)
- Mesh # 35 (0.5mm)
- Mesh # 100
- Mesh # 200
- Mesh # 325
- Pan

Sartorius Scale - Model: 3808MPS-IV20, Serial Number: 39030006
Ro-Tap machine – Model-B Spec # 34C63-5506 Combustion Engine
Sieve Brush
Spatula
Ziploc Bag (1 gallon)
Plastic Bottles size, and size

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From Page No. 19 April 05 MR cont.

~~**Basic Outline Procedure**:~~ See revised initial entry 631/72-73 21 Apr. 05 MR

~~Dry samples will be sieved for 15 minutes on Ro-Tap machine using Meshes #5, 10 and 35. Each mesh fraction will be weighed and recorded. Pan sediments (< Mesh #35) will be quartered. From one of the quarters 10g will be removed and labeled to be used for XRD analysis. From the other 75%, 15g will be removed and labeled to be used for XRF analysis. ~~All excess pan sediments will be separated and labeled for 'Archive.'~~ MR 19-04-05 Once all samples have been sieved using meshes #5, 10 and 35, they will be re-sieved using meshes # 100, 200 and 325. Again mesh fractions will be weighed and recorded. Samples will be recombined in Ziploc bag. Storage location will be recorded and Rt database will be updated.~~

20 April 05 MR.

Sieving Data for NC-EWPP-22PC-Sonic Core Samples

Initial Entry: 631/69-70

Samples: NC-EWDP-22PC-0305-interval 631/~~69-70~~ 67-68 20 Apr 05 MR

~~ID Mass(g) at Mesh #5 Mass(g) at Mesh # 10~~ 20 Apr 05 MR

~~ID Mass(g) at Mesh #5 Mass(g) at Mesh # 10 Mass(g) at Mesh # 35 Mass(g) Pan (< #35)~~

20 Apr. 05 MR

Paper tared on scale. Weights recorded are without the 19.7g of paper weight.

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ID	Mass(g) at Mesh #5	Mass(g) at Mesh #10	Mass(g) at Mesh #35	Mass(g) at Pan (< #35)
694.3-695.6	277.9	57.9	81.9	~~6.6~~ 6 May 2005 MR

*see corrected weight 710/11

21 Apr. 05 MR

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From Page No.___ 21 Apr. 05 MR

Sieve Analysis of NC-EWDP-22PC Sonic Core Samples

Personnel involved: Marla Roberts

Objectives

The sieving of the samples is conducted with three objectives:

- To characterized the sonic core samples by quantifying the amount of material in various mesh ranges
- To divide the sample into various mesh ranges in preparation for XRD, XRF, and surface area analyses.
- To create a subsample of material less than mesh 35 for potential use in sorption experiments

Samples

59 samples from NC-EWDP-22PC labeled as NC-EWDP-22PC-0305-"interval" from 631/67-68

- Initial collection at SMF 631/55-64
- Receipt at CNWRA 631/66

Equipment

- Sartoruis Scale - Model 3808MPS-IV20, serial # 39030006
- Ro-Tap machine - Model-B Spec # 34C63-5506 Combustion Engine

Supplies

- Sieve brushes
- Spatula
- Ziplock bags
- Various sizes of polystyrene bottles
- U.S.A Standard Test Sieve, ASTM E-11 Specification, from Fisher Scientific mesh #s 5, 10, 35, 100, 200, 325, and bottom pan
- Surface protector paper
- Weighing paper

Procedure

Each sample will be individually sieved for 15 minutes on the Ro-Tap machine using mesh #s 5, 10, and 35. This will divide the sample into four groups: greater than (>) mesh # 5, between mesh #s 5 and 10, between mesh #s 10 and 35, and less than (<) mesh # 35. A piece of surface protector paper will be placed on the scale and tared. The material from each mesh range will be individually placed on the scale and the mass will be recorded. The material from the three mesh ranges with the largest size material (>5, 5-10, and 10-35) was temporarily transferred into separate ziplock bags. These three bags were placed inside the original ziplock bag for that particular sample. In the future, the material from these three mesh ranges groupings may be recombined into one subsample. For now there are kept separate because aliquots from these specific mesh ranges may be sampled for analyses.

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From Page No.___ 21 Apr. 05 MR ~~21 Apr 05 MR~~ ~~04~~ cont.

Aliquots for XRD and XRF analyses were collected from the less than (<) 35 material portion. The less than (<) 35 material was placed on a piece of surface protector paper. The sample was then quartered. Ideally, the XRF and XRD samples would come from different quarters, but this may not be possible base on the amount of material present. About 10 grams was removed from one quarter portion for XRD and about 15 grams was removed from a different quarter portion for XRF analyses. A polystyrene bottle was placed on the scale and tared. Once the appropriate amount of material was added, the mass was recorded. The polystyrene bottle was then appropriately labeled. The label prefix "22" represents the well ID - NC-EWDP-22PC. The label suffix represents the actual analyses performed: "F" for XRF and "D" for XRD. The middle number of the label represents the sample interval depth. A single number (depth) was selected within the original sample interval range that did not overlap with any other sample interval range.

After the XRF and XRD sampling was finished, the remaining portion of the less than (<) 35 material was transferred into a single polystyrene bottle. These bottles were labeled like the original samples (ie NC-EWDP-22PC-0305-462.0-462.9) with the suffix "<#35" added. More characterization of the less than (<) 35 portion is planned by further quantifying the amount of material in even smaller mesh ranges (100, 200, and 325). Also, surface area analyses of the less than (<) 35 portions is planned. These other characterizations would occur after this initial sieving process is completed. CNWRA staff want to send the XRF and XRD samples to the other labs for analyses as quickly as possible.

*previous initial entry: 631/69-70

Recorded weights of oven dried samples

*Sample prefixes: NC-EWDP-22PC-0305 631/67-68

ID	Mass(g) after oven dried	date dried
540.8-542.4	495.4	20 April 2005
507.4-509.1	~~21 Apr 05 MR~~ ~~414.8~~ 414.8	19 Apr. 2005
595.0-596.6	474.5	19 Apr. 2005

Recorded mass is without weight of bag ~12.8g

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Sieve Analysis - Grain Size Distribution of Sonic Core Samples, NC-EWDP-22PC-0305

ID	Mass(g) >#5	Mass(g) #5-#10	Mass(g) #10-#35	Mass(g) <#35
753.2-754.9	212.7	82.1	112.9	87.2
630.2-631.9	336.6	77.9	97.3	84.7
735.7-736.4	263.0	74.7	78.5	82.2
663.7-665.2	284.2	21 Apr. 05 MR ~~50.0~~ 50.3	84.6	86.4
726.4-727.8	239.1	42.7	61.7	73.5
710.6-712.1	497.0	14.4	36.3	48.9
640.3-641.4	286.7	121.3	123.6	106.7
647.1-648.4	192.4	71.8	122.9	106.9

22 Apr. 05 MR

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XRF Aliquot Sample ID	Mass(g)	XRD Aliquot Sample ID	Mass(g)
22-753-F	15.4	22-753-D	10.0g
22-631-F	15.2	22-631-D	10.2
22-736-F	15.2	22-736-D	10.2
22-664-F	15.0	22-664-D	10.0
22-726-F	15.2	22-726-D	10.1
22-711-F	15.0	22-711-D	10.0
22-640-F	15.2	22-640-D	10.1
22-647-F	15.1	22-647-D	10.1

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Sieve Analysis - Grain Size Distribution of Sonic + Core Samples NC-EWDP-22PC-0305 22Apr05 MR

See initial entry 631 / 72-73

ID	Mass(g) >#5	Mass(g) #5-#10	Mass(g) #10-#35	Mass(g) <#35
462.0-462.9	279.4	90.0	115.7	100.9
464.9-466.5	413.2	106.2	126.7	88.5
507.4-509.1	175.0	76.8	105.2	56.2

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Book No.

From Page No. 22 April 05 MR cont.

XRF Aliquot		XRD Aliquot	
Sample ID	Mass(g)	Sample ID	Mass(g)
22-462-F	15.0	22-462-D	10.2
22-465-F	15.0	22-465-D	10.0
22-508-F	15.0	22-508-D	10.0

25 April 05 MR

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From Page No. 25 April 2005 MR

see initial entry 631 / 72-73

Sieve Analysis - Grain Distribution of Sonic Core Samples
NC-EWDP-22PC-0305

ID	Mass(g) >#5	Mass(g) #5-#10	Mass(g) #10-#35	Mass(g) <#35-Pan
595.0-596.6	216.8	78.6	115.4	61.6
540.8-542.4	156.3	113.4	127.2	97.0
522.1-523.5	255.0	116.6	127.5	49.3
600.5-602.0	259.3	99.1	124.8	97.8

26 April 05 MR

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XRF Aliquot		XRD Aliquot	
Sample ID	Mass(g)	Sample ID	Mass(g)
22-596-F	15.1	22-596-D	10.1g
22-541-F	15.2	22-541-D	10.1
22-522-F	15.1	22-522-D	10.0
22-601-F	15.0	22-601-D	10.1

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26 April 05 TMR

Chain of custody from OCR MRA for NCEWDP22PC 0305 samples. See initial entry 631/616.

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Book No. ___
TITLE ___

BSC

SMF Specimen Custody Receipt

QA:QA
CSITS v.1

Requestor:	Ship To:	
Bradley Werling (ID#757) **6220 Culebra Rd.** **Bldg 57** **San Antonio, TX 78238-5166**	**Bradley Werling (ID#757)** **6220 Culebra Rd.** **Bldg 57** **San Antonio, TX 78238-5166**	Date Received: 4-6-2005 Shipment ID: 01000770 Shipping Date: 05-apr-2005 SMF Geotechnician Gene McNelson Date 4-4-05

Container ID: 01006519 — Specimens in this container: 30

Condition	Specimen ID	Type	Top	Bottom	Parent Borehole:
	01026614	WCSpec	462.0	462.9	NC-EWDP-22PC
	01026615	WCSpec	464.9	466.5	NC-EWDP-22PC
	01026616	WCSpec	471.3	473.2	NC-EWDP-22PC
	01026617	WCSpec	476.9	478.5	NC-EWDP-22PC
	01026618	WCSpec	480.0	481.8	NC-EWDP-22PC
	01026619	WCSpec	486.9	488.5	NC-EWDP-22PC
	01026620	WCSpec	492.7	493.8	NC-EWDP-22PC
	01026621	WCSpec	497.7	499.3	NC-EWDP-22PC
	01026622	WCSpec	502.5	504.2	NC-EWDP-22PC
	01026623	WCSpec	507.4	509.1	NC-EWDP-22PC
	01026624	WCSpec	513.3	515.3	NC-EWDP-22PC
	01026625	WCSpec	517.4	519.2	NC-EWDP-22PC
	01026626	WCSpec	522.1	523.5	NC-EWDP-22PC
	01026627	WCSpec	529.8	531.6	NC-EWDP-22PC
	01026628	WCSpec	534.5	536.2	NC-EWDP-22PC
	01026629	WCSpec	539.2	540.8	NC-EWDP-22PC
	01026630	WCSpec	540.8	542.4	NC-EWDP-22PC
	01026631	WCSpec	546.7	548.5	NC-EWDP-22PC
	01026632	WCSpec	550.2	551.8	NC-EWDP-22PC
	01026633	WCSpec	555.3	556.8	NC-EWDP-22PC
	01026634	WCSpec	560.6	562.2	NC-EWDP-22PC
	01026635	WCSpec	566.2	568.1	NC-EWDP-22PC
	01026636	WCSpec	571.3	573.0	NC-EWDP-22PC
	01026637	WCSpec	576.3	578.1	NC-EWDP-22PC
	01026638	WCSpec	580.6	581.9	NC-EWDP-22PC

Please Sign this form and return to:
Sample Management Facility
Yucca Mountain Site Characterization Project
P.O. Box 617
Mercury, NV 89023-0617

I hereby acknowledge the receipt of the Specimens listed above. I will return this form to the SMF within 10 business days of receipt.

Recipient Bradley Werling Date 4-25-2005

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SMF Specimen Custody Receipt

QA:QA
CSITS v.1

Requestor:	Ship To:	
Bradley Werling (ID#757) **6220 Culebra Rd.** **Bldg 57** **San Antonio, TX 78238-5166**	**Bradley Werling (ID#757)** **6220 Culebra Rd.** **Bldg 57** **San Antonio, TX 78238-5166**	Date Received: 4-6-2005 Shipment ID: 01000770 Shipping Date: 05-apr-2005 SMF Geotechnician Gene McNelson Date 4-4-05

Container ID: 01006519 — Specimens in this container: 30

Condition	Specimen ID	Type	Top	Bottom	Parent Borehole:
	01026639	WCSpec	588.3	589.9	NC-EWDP-22PC
	01026640	WCSpec	595.0	596.6	NC-EWDP-22PC
	01026641	WCSpec	600.5	602.0	NC-EWDP-22PC
	01026642	WCSpec	604.9	606.3	NC-EWDP-22PC
	01026643	WCSpec	610.1	611.0	NC-EWDP-22PC

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Recipient Bradley Werling Date 4-25-2005

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BSC

SMF Specimen Custody Receipt

QA:QA
CSITS v.1

Requestor:	Ship To:	
Bradley Werling (ID#757) 6220 Culebra Rd. Bldg 57 San Antonio, TX 78238-5166	Bradley Werling (ID#757) 6220 Culebra Rd. Bldg 57 San Antonio, TX 78238-5166	Date Received: 4-6-2005 Shipment ID: 01000770 Shipping Date: 05-apr-2005 SMF Geotechnician Anne McNelson Date 4-4-05

Container ID: 01006520 Specimens in this container: 29

Condition	Specimen ID	Type	Top	Bottom	Parent Borehole:
	01026644	WCSpec	614.1	615.5	NC-EWDP-22PC
	01026645	WCSpec	618.5	620.5	NC-EWDP-22PC
	01026646	WCSpec	625.2	626.7	NC-EWDP-22PC
	01026647	WCSpec	630.2	631.9	NC-EWDP-22PC
	01026648	WCSpec	636.7	637.9	NC-EWDP-22PC
	01026649	WCSpec	640.3	641.4	NC-EWDP-22PC
	01026650	WCSpec	644.6	645.0	NC-EWDP-22PC
	01026651	WCSpec	647.1	648.4	NC-EWDP-22PC
	01026652	WCSpec	653.1	654.5	NC-EWDP-22PC
	01026653	WCSpec	658.3	659.7	NC-EWDP-22PC
	01026654	WCSpec	663.7	665.2	NC-EWDP-22PC
	01026655	WCSpec	670.5	672.0	NC-EWDP-22PC
	01026656	WCSpec	675.9	677.3	NC-EWDP-22PC
	01026657	WCSpec	681.9	683.3	NC-EWDP-22PC
	01026658	WCSpec	686.1	687.4	NC-EWDP-22PC
	01026659	WCSpec	694.3	695.6	NC-EWDP-22PC
	01026660	WCSpec	700.9	702.1	NC-EWDP-22PC
	01026661	WCSpec	707.0	707.8	NC-EWDP-22PC
	01026662	WCSpec	710.6	712.1	NC-EWDP-22PC
	01026663	WCSpec	715.0	717.1	NC-EWDP-22PC
	01026664	WCSpec	721.5	722.3	NC-EWDP-22PC
	01026665	WCSpec	726.4	727.8	NC-EWDP-22PC
	01026666	WCSpec	735.7	736.4	NC-EWDP-22PC
	01026667	WCSpec	740.5	742.0	NC-EWDP-22PC
	01026668	WCSpec	745.0	745.9	NC-EWDP-22PC

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Sample Management Facility
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Mercury, NV 89023-0617

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Recipient Bradley Werling Date 4-25-05

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Date

BSC

SMF Specimen Custody Receipt

QA:QA
CSITS v.1

Requestor:	Ship To:	
Bradley Werling (ID#757) 6220 Culebra Rd. Bldg 57 San Antonio, TX 78238-5166	Bradley Werling (ID#757) 6220 Culebra Rd. Bldg 57 San Antonio, TX 78238-5166	Date Received: 4-6-2005 Shipment ID: 01000770 Shipping Date: 05-apr-2005 SMF Geotechnician Anne McNelson Date 4-4-05

Container ID: 01006520 Specimens in this container: 29

Condition	Specimen ID	Type	Top	Bottom	Parent Borehole:
	01026669	WCSpec	747.4	748.8	NC-EWDP-22PC
	01026670	WCSpec	753.2	754.9	NC-EWDP-22PC
	01026671	WCSpec	756.3	758.1	NC-EWDP-22PC
	01026672	WCSpec	760.3	761.6	NC-EWDP-22PC

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Recipient Bradley Werling Date 4-25-2005

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See initial entry 631/72-73

Sieve Analysis - Grain Distribution of Sonic Core Samples - NLEWDP22PC 0305

ID	26 Apr 05 MR ~~Mag~~ Mass (g) >#5	Mass (g) #5-#10	Mass (g) 26 Apr 05 MR #10-~~35~~ #35	Mass (g) <#35 - pan
610.1-611.0	322.8	78.3	118.3	103.4
534.5-536.2	159.0	131.0	207.9	86.1
576.3-578.1	261.8	88.5	109.1	76.5
550.2-551.8	279.3	83.5	145.6	95.1
546.7-548.5	272.4	91.8	128.8	75.3
529.8-531.6	215.1	55.7	87.4	61.3
497.7-499.3	219.5	51.4	103.2	83.8
604.9-606.3	258.6	66.5	84.4	91.7

28 Apr. 05

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Aliquot Removal from <#35 for XRF and XRD analysis - See initial entry 631/72-73

26 Apr 05 MR ~~So~~

XRF Aliquot Sample ID	Mass (g)	XRD Aliquot Sample ID	Mass (g)
22-610-F	15.1	22-610-D	10.1
22-535-F	15.1	22-535-~~F~~D 26 Apr 05 MR	10.0
22-577-F	15.0	22-577-D	10.0
22-550-F	15.0	22-550-D	10.2
22-547-F	15.0	22-547-D	10.1
22-530-F	15.0	22-530-D	10.0
22-498-F	15.0	22-498-D ~~22-5~~ 26 Apr 05 MR	10.1
22-605-F	15.2	22-605-D	10.0

28 Apr. 05 MR

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Recorded by

From Page No. 26 April 05 MR cont.

Record weights of oven dried Samples – NCEWDP 22PC 0305

*Sample prefixes: NC-EWDP-22PC-0305
See initial entry 631 / 66-69
mass is without weight of bag ~ 12.7g

ID	Mass (g) after oven dried	Date dried
534.5 – 536.2	584.6	20 April 05
513.3 – 515.3	609.7	20 Apr. 05
588.3 – 589.9	488.0	20 Apr. 05
480 – 481.8	498.6	21 Apr. 05
517.4 – 519.2	558.1	21 Apr. 05
566.2 – 568.1	668.2	21 Apr. 05
576.3 – 578.1	537.8	19 Apr. 05
546.7 – 548.5	570.1	19 Apr. 05
550.2 – 551.8	604.4	18 Apr. 05

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From Page No. 26 April 05 MR cont.

ID	Mass (g) after oven dried	Date dried
529.8 – 531.6	421.5	21 Apr. 05
604.9 – 606.3	503.3	26 Apr. 05
502.5 – 504.2	621.7	26 Apr. 05
497.7 – 499.3	~~459.4~~ 459.4 26 Apr. 05 MR	26 Apr. 05
571.3 – 573.0	468.5	26 Apr. 05
492.7 – 493.8	518.9	26 Apr. 05
486.9 – 488.5	497.7	26 Apr. 05

28 Apr. 05 MR

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From Page No. 28 April 05 MR.

See initial entry 631/72-73

Sieve Analysis - Grain Distribution of Sonic Core Samples.
NL-EWDP-22PC-0305

ID	Mass(g) >#5	Mass(g) #5-#10	Mass(g) #10-#35	Mass(g) <#35-Pan
486.9-488.5	311.0	53.9	69.6	61.5
MR 28 Apr 05 ~~49~~ 492.7-493.8	250.7	61.4	111.7	93.8
571.3-573.0	MR 28 Apr 05 ~~22~~ 254.4	55.1	83.7	74.8
502.5-504.2	347.7	89.9	102.0	81.3
566.2-568.1	493.6	53.6	68.6	52.8
480.0-481.8	225.9	80.9	123.0	68.4
588.3-589.9	219.4	57.0	113.2	96.9

29 Apr 05 MR

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From Page No. 28 April 05 MR cont.

Aliquot Remove from <#35 for XRF and XRD analysis - see initial entry 631/72-73

~~Sample~~ 28 Apr 05 MR

XRF Aliquot Sample ID	Mass(g)	XRD Aliquot Sample ID	Mass(g)
28-05-05 MR ~~SS~~ 22-487-F	15.1	28 MR 05 ~~22-SS~~-487-D	10.0
28-05-05 MR ~~SS~~ 22-492-F	15.0	28-05-05 MR ~~22-SS~~-492-D	10.1
28-05-05 MR ~~SS~~ 22-572-F	15.1	28-05-05 MR ~~22-SS~~-572-D	10.1
28-05-05 MR ~~SS~~ 22-503-F	15.0	28-05-05 MR ~~22-SS~~-503-D	10.1
22-567-F	14.9	22-567-D	10.0
22-480-F	15.0	22-480-D	10.0
22-589-F	15.0	22-589-D	10.0

29 Apr 05 MR

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From Page No. 29 April 05 MR

See initial entry 631 / 72-73

Sieve Analysis – Grain Distribution of Sonic Core Samples NC-EWDP-22PC-0305

ID	29Apr.05 MR Mass (g) >#5	Mass (g) #5-#10	Mass (g) #10-#35	Mass (g) <#35
513.3 – 515.3	304.5	90.8	131.9	82.5
580.6 – 581.9	313.7	58.7	112.3	103.9
560.6 – 562.2	357.0	78.7	96.4	90.4

2 May 05 MR

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From Page No. 29 April 05 MR cont.

Aliquot Removal from <#35 for XRF and XRD

See ~~initial~~ 29Apr.05 MR initial entry 631/72-73

XRF Aliquot		XRD Aliquot	
Sample ID	Mass (g)	Sample ID	29Apr.05 MR Mass (g)
22-514-F	15.0	22-514-D	10.2
22-580-F	15.1	22-580-D	10.2
22-561-F	15.0	22-561-D	10.1

2 May 2005 MR

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Book No. TITLE

From Page No. 2 May 2005 MR
See initial entry 631/72-73
*sample prefixes: NCFWDP22PC 0305

Siere Analysis - Grain Distribution of Sonic Core Samples - NCFWDP22PC 0305

ID	Mass(g) >#5	Mass(g) #5-#10	Mass(g) #10-#35	Mass(g) <#35-Pan
517.4-519.2	143.1	112.9	209.2	91.2
625.2-626.7	244.5	101.3	168.8	141.5
658.3-659.7	259.4	86.8	157.6	111.5

3 May 05 MR

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From Page No. 2 May 2005 MR cont.
See initial entry 631/72-73

Aliquot Removal from <#35 for XRF & XRD

XRF Aliquot Sample ID	Mass(g)	XRD Aliquot Sample ID	Mass(g)
22-518-F	15.2	22-518-D	10.1
22-625-F	15.0	22-625-D	10.1
22-659-F	15.2	22-659-D	10.2

3 May 05 MR

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From Page No. 3 May 05 MR

See initial entry 631/72-73

*Sample prefixes: NC-EWDP-22PC-0305

Sieve Analysis - Grain Distribution of Sonic Core Samples - NC EWDP 22PC 0305

ID	Mass (g) >#5	Mass (g) #5-#10	Mass (g) #10-#35	Mass (g) <#35-Pan
707.0-707.8	275.2	54.2	68.4	96.9
756.3-758.1	244.5	79.7	95.8	101.5
745.0-745.9	350.8	48.3	73.3	89.9
681.9-683.3	305.2	68.1	109.4	100.2
675.9-677.3	298.4	74.6	101.5	92.8
644.6-645.0	83.9	17.4	25.2	32.5
636.7-637.9	372.2	48.6	58.5	75.3
670.5-672.0	379.7	57.4	55.1	49.8

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From Page No. 3 May 05 MR cont.

See initial entry 631/72-73

Aliquot Removal from <#35 for XRF & XRD Analysis

XRF Aliquot Sample ID	Mass (g)	XRD Aliquot Sample ID	Mass (g)
22-707-F	15.0	22-707-D	10.1
22-757-F	15.1	22-757-D	10.1
22-745-F	15.0	22-745-D	10.1
22-682-F	15.1	22-682-D	10.0
22-676-F	15.1	22-676-D	10.1
22-645-F	15.0	22-645-D	7.1
22-636-F	15.0	22-636-D	10.3
22-671-F	15.0	22-671-D	10.0

5/3/05

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From Page No. 3 MAY 05 CONT BAW

END of Scientific Notebook 631
ENTRIES continued in SN 710
No further scientic entries.

I have reviewed this scientific notebook and find it in agreement with QAP-001. There is sufficient information regarding methods used for conducting tests, acquiring and analyzing data so that another qualified individual could repeat the activity.

R. C. Peary
3/19/2005

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		Recorded by	