

Particle Technology Labs, Ltd.



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April 16, 1997

ERC
 MSIN B1-35
 3350 George Washington Way
 Richland, WA 99352

ATTN: Ms. Doris Ayres

SUBJECT: Solids Concentration, Particle Size Distribution,
 and pH Analyses of Eleven Samples

PTL PROJECT: 2140

CC: Mr. Mark Buckmaster

Dear Ms. Ayres:

Enclosed are the results from the total suspended solids, particle size, and pH analyses performed on your eleven samples received 4-4-97. The total suspended solid analyses of your eleven samples were conducted in a normal routine. As discussed with Mr. Mark Buckmaster and verified by Mr. Floyd Willis, your samples were filtered through 1.2 micron filters. We then pressure washed the particulates out of the bottles in order to affect a quantitative transfer. Following the transfer of all the fluids, we washed the filter membranes with 0.8 micron, filtered deionized water. This final wash was conducted to remove any dissolved salts which might have been present in the original water samples. Each filter membrane was then removed and placed in our standard drying oven at 45° C to dry overnight. After the filters were dried, they were cooled to room temperature in our laboratory desiccator and their final weights were recorded.

The sensitivity of our Sartorius analytical balance is ± 0.2 milligrams as determined by our independent balance certification company. We do not know the sensitivity specifications of our Sartorius top-loading mechanical scale. The full scale maximum weight for this balance is 3 kilograms. Typically, these balances have a sensitivity value of ± 0.1 grams.

The results from the total suspended solid analyses have been compiled and appear in Table 1 of this report. We have also listed the net weights of the particulate retained on the filters. Each filter has been placed in aluminum foil and returned to Mr. Mark Buckmaster's attention, for examination and archiving purposes.



The particle size of your samples was analyzed on our HIAC/Royco Model 8000A Analyzer and Model 3000 SOS Sampling Head. The detector was a **HRLD150**, which signifies High Resolution, Laser Diode 150 micron maximum particle size.

Prior to beginning the analysis, we verified that the system was electronically noise-free by analyzing a blank water sample filtered through a 0.2 micron cartridge. The results have been included in this report. The data demonstrates very low background concentration, hence noise-free electronics.

The bottles were opened and analyzed in a Class 100 Clean Bench in order to ensure a contamination-free environment. Your samples were analyzed in accordance with standard operating procedures for this class of instrumentation. Each sample was analyzed in replicate aliquot portions, resulting in separate analysis outputs that were then averaged by the instrument's software. Following the analysis of each sample, the instrument was purged with a blank water sample to avoid any cross-contamination between samples. The data generated from your samples was transferred to our standard report format, and can be found on the following pages. Copies of the original data may be mailed to you should you request it.

As requested, pH measurements were conducted. These readings can be found in Table 2 of this report.

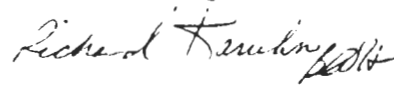
We hope this information will be beneficial for your future use. If there are any questions concerning this data, please do not hesitate to contact us here at Particle Technology Labs.

Submitted by,



Kelli Parrott

Reviewed by,



Richard Karuhn

TABLE 1

TOTAL SUSPENDED SOLIDS CONCENTRATION

<u>SAMPLE ID</u>	<u>WEIGHT OF PARTICULATE RETAINED ON FILTER (mg)</u>	<u>PARTS PER MILLION by WEIGHT</u>
BOJXK0	12.3	6.0
BOJXK1	17.9	8.8
BOJXK2	1.8	0.8
BOJXK3	2.8	0.6
BOJXK4	2.8	0.6
BOJXK5	8.4	2.8
BOJXK6	2.5	0.6
BOJXK7	2.0	0.4
BOJXJ7	19.9	10.0
BOJXJ8	29.3	29.8
BOJXJ9	6.4	3.1

TABLE 2
pH MEASUREMENTS

<u>SAMPLE ID</u>	<u>pH READING</u>
BOJXK0	7.65
BOJXK1	7.68
BOJXK2	7.61
BOJXK3	7.58
BOJXK4	7.73
BOJXK5	7.69
BOJXK6	8.06
BOJXK7	7.92
BOJXJ7	7.53
BOJXJ9	7.56
BOJXJ8	7.54

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HIAC ROYCO CONTAMINATION ANALYSIS REPORT

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=====
CLIENT NAME:      BECHTEL HANFORD          PTL PROJECT#:    2140
SOURCE:          Mr. Mark Buckmaster    OPERATOR:        KP
SAMPLE ID:       BLANK                  PTL ID:          NONE
DATE:            4/2/97                  S.N.:            89053004
=====
    
```

```

=====
SAMPLE FILE      : 2140C.HR:63          SAMPLE VOLUME:    : 3.0 mL
NO. RUNS         : 3                    DILUENT VOLU:E:  : 0.0 mL
ALIQUOT VOLUME  : 1.0 mL                DILUTION FACTOR: : 1:1
=====
    
```

DIFFERENTIAL COUNTS

RUN	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
#	(2.0)	(3.0)	(5.0)	(10.0)	(15.0)	(20.0)	(30.0)	(50.0)
1	.167	.667	.333	.167	0	0	.833	1.33
2	.833	.5	.333	0	0	0	.333	.333
3	.5	.5	.667	0	0	0	.667	1
MEAN:	1	1	0	0	0	0	1	1
STD DEV:	.3	.1	.2	.1	.0	.0	.3	.5
BGD/100mL								
PRT/100mL								

CUMULATIVE COUNTS

RUN	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
#	(2.0)	(3.0)	(5.0)	(10.0)	(15.0)	(20.0)	(30.0)	(50.0)
1	3.497	3.33	2.663	2.33	2.163	2.163	2.163	1.33
2	2.332	1.499	.999	.666	.666	.666	.666	.333
3	3.334	2.834	2.334	1.667	1.667	1.667	1.667	1
MEAN:	3	3	2	2	1	1	1	1
STD DEV:	.6	.9	.9	.8	.8	.8	.8	.5
BGD/100mL								
PRT/100mL								

```

=====
ANALYST                    K. Parrott                    DATE                    4/2/97          
APPROVED BY               Richard Kambo                    DATE                                            
    
```

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HIAC ROYCO CONTAMINATION ANALYSIS REPORT

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=====
CLIENT NAME:      BECHTEL HANFORD          PTL PROJECT#:   2140
SOURCE:          Mr. Mark Buckmaster    OPERATOR:       KP
SAMPLE ID:       BOJXKO                 PTL ID:         14689
DATE:            4/2/97                 S.N.:          89053004
=====
    
```

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=====
SAMPLE FILE      : 2140A.HR:63          SAMPLE VOLUME:   : 3.0 mL
NO. RUNS        : 3                     DILUENT VOLU:E: : 0.0 mL
ALIQUOT VOLUME  : 1.0 mL                DILUTION FACTOR: : 1:1
=====
    
```

DIFFERENTIAL COUNTS

RUN	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
#	(2.0)	(3.0)	(5.0)	(10.0)	(15.0)	(20.0)	(30.0)	(50.0)
1	12.5	14.333	10.5	4.333	1.333	.833	0	0
2	11.5	13.833	11.833	4.833	1.167	1.167	.167	0
3	14.333	14.5	9.667	3.333	1.833	.667	.167	0
MEAN:	13	14	11	4	1	1	0	0
STD DEV:	1.4	.3	1.1	.8	.3	.3	.1	.0
BGD/100mL								
PRT/100mL								

CUMULATIVE COUNTS

RUN	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
#	(2.0)	(3.0)	(5.0)	(10.0)	(15.0)	(20.0)	(30.0)	(50.0)
1	43.832	31.332	16.999	6.499	2.166	.833	0	0
2	44.5	33	19.167	7.334	2.501	1.334	.167	0
3	44.5	30.167	15.667	6	2.667	.834	.167	0
MEAN:	44	31	17	7	2	1	0	0
STD DEV:	.4	1.4	1.8	.7	.3	.3	.1	.0
BGD/100mL								
PRT/100mL								

```

=====
ANALYST      K. Parratt                DATE      4/2/97
APPROVED BY  Richard. Kambin           DATE      _____
    
```

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HIAC ROYCO CONTAMINATION ANALYSIS REPORT

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=====
CLIENT NAME:      BECHTEL HANFORD          PTL PROJECT#:    2140
SOURCE:           Mr. Mark Buckmaster       OPERATOR:        KP
SAMPLE ID:        BOJXK2                 PTL ID:          14697
DATE:             4/2/97                  S.N.:           89053004
=====
    
```

```

=====
SAMPLE FILE      : 2140B.HR:63          SAMPLE VOLUME:   : 3.0 mL
NO. RUNS         : 3                    DILUENT VOLU:E:  : 0.0 mL
ALIQUOT VOLUME   : 1.0 mL              DILUTION FACTOR: : 1:1
=====
    
```

DIFFERENTIAL COUNTS

RUN	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
#	(2.0)	(3.0)	(5.0)	(10.0)	(15.0)	(20.0)	(30.0)	(50.0)
1	8.833	10.167	6.333	1.667	.333	.333	.333	.167
2	9.167	11.333	6.833	1	.5	.333	.167	0
3	10.167	9.167	7.167	1	.167	.667	0	0
MEAN:	9	10	7	1	0	0	0	0
STD DEV:	.7	1.1	.4	.4	.2	.2	.2	.1
BGD/100mL								
PRT/100mL								

CUMULATIVE COUNTS

RUN	CH1	CH2	CH3	CH4	CH5	CH6	CH7	CH8
#	(2.0)	(3.0)	(5.0)	(10.0)	(15.0)	(20.0)	(30.0)	(50.0)
1	28.166	19.333	9.166	2.833	1.166	.833	.5	.167
2	29.333	20.166	8.833	2	1	.5	.167	0
3	28.335	18.168	9.001	1.834	.834	.667	0	0
MEAN:	29	19	9	2	1	1	0	0
STD DEV:	.6	1.0	.2	.5	.2	.2	.3	.1
BGD/100mL								
PRT/100mL								

ANALYST

K. Parrott

DATE

4-2-97

APPROVED BY

Richard Karuba

DATE