NUS-3594

FACILITIES STACK AUDIT, URAVAN URANIUM MILL

PREPARED FOR

UNION CARBIDE CORPORATION, METALS DIVISION
GRAND JUNCTION, COLORADO

MAY 23, 1980

NUS CORPORATION
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HOUSTON, TEXAS 77079

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SECTION I

INTRODUCTION

NUS Corporation was contracted to collect particulate samples from process exhaust stacks at Union Carbide Corporation's, Uravan, Colorado, uranium mill. Twenty-four particulate samples and sixteen particle-size distribution samples were collected during the four day period March 4, 1980 - March 7, 1980. The NUS sampling team consisted of Messrs. J. D. Smith, Philip Chu, and Reginald Chase. The program was coordinated by Union Carbide Corporation's Mr. Roger Jones.

The results of the sampling program are summarized in Section 2 and presented in greater detail in the Discussion Section (Section 3). The appendices contain the field data (Appendix A), laboratory results (Appendix B), a calculation summary (Appendix C) and resumes of the NUS sampling team.

SECTION 2

SUMMARY OF RESULTS

The results of the process exhaust stack particulate sampling are summarized in Table 1. The stack temperature velocities, flow rates and particulate emission rates represent the averages of three separate for each source. The results are presented in greater detail in Section 3.

Table 1

Summary of Results

Source	Stack Temp, ^{O}F	Velocity, fps	Volumetric Flow Rate, acfm	Particulate Emission Rate, lbs/hr.
AK Leach Stack	55	67.14	3,162	4.73
Fine Ore Bend	70	57.23	24,273	31.10
YC Dryer	119	17.90	3,221	0.24
Leach Stack	97	8.38	2,469	3.72
Aerofall #1	130	70.40	9,216	11.97
Aerofall #2	125	72.72	9,520	4.95
Aerofall #3	120	72.57	9,501	1.98
Aerofall #4	129	67.43	8,827	12.92

SECTION 3

DISCUSSION

The field test program consisted of the collection of three particulate and two particle-size distribution samples from each of the eight process exhaust stacks. The date, time, and amount of time sampled for each run appears in Table 2. The particulate samples were collected using a sampling train composed of:

1. Heated-lined probe with attached "S"-type pitot tube and thermocouple.
2. Heated fiberglass filter to collect particulates.
3. Series of four (4) impingers to collect submicron particulates and condensate.
4. Console containing vacuum pump, dry test meter, thermocouple readouts, oven temperature controls, and flow controls.

In operation, the filter was placed in its holder; the impingers were charged; the sample train was assembled; the filter oven heater was turned on; and a pretest leak check of the sample train and pitot tubes was performed. Once the oven heated up, the probe tip was moved to the first point and the sampling commenced. The clock time, dry gas meter reading, velocity head (ΔP), ΔH, dry gas meter temperatures, vacuum, oven temperature, stack temperature, and impinger exit temperature were recorded at each point. The field data sheets appear in Appendix A.

At the conclusion of each run, the probe was withdrawn from the stack and a post-sampling leak check was performed. Once the probe cooled, it was rinsed with acetone and cleaned.

TABLE 2

SAMPLING PROGRAM

Source	Date	Sample No.	Time	# Minutes Sampled
YC Dryer	3/4/80	1	1254-1435	96
	"	2	1629-1808	96
	3/5/80	3	0900-1041	96
	3/4/80	Impactor #1	1820-1827	7
	3/5/80	Impactor #2	1051-1100	9
Aerofall #1	3/5/80	1	1150-1303	60
	"	2	1715-1817	60
	3/6/80	3	1703-1807	60
	3/7/80	Impactor #1	0950-1000	10
	"	Impactor #2	1033-1043	10
Aerofall #2	3/6/80	1	0809-0912	60
	"	2	1110-1217	60
	"	3	1510-1616	60
	"	Impactor #1	1236-1246	10
	3/7/80	Impactor #2	0916-0926	10
Leach Stack	3/7/80	1	1420-1524	60
	"	2	1718-1822	60
	"	3	2012-2109	60
	"	Impactor #1	2236-2246	10
	"	Impactor #2	2315-2325	10
Aerofall #3	3/5/80	1	1320-1425	60
	"	2	1709-1824	60
	3/6/80	3	1705-1808	60
	3/5/80	Impactor #1	1847-1855	8
	3/6/80	Impactor #2	1822-1832	10
Aerofall #4	3/6/80	1	0803-0908	60
	"	2	1013-1121	60
	"	3	1156-1301	60
	"	Impactor #1	1514-1524	10
	3/7/80	Impactor #2	0834-0841	7

Table 2 - Continued

Source	Date	Sample No.	Time	# Mintues Sampled
AK Leach	3/7/80	1	0704-0810	56
	"	2	0902-1003	56
	"	3	1047-1147	56
	"	Impactor #1	1157-1207	10
	"	Impactor #2	1213-1223	10
Fine Ore Bend	3/7/80	1	0954-1111	60
	"	2	1152-1303	60
	"	3	1408-1522	60
	"	Impactor #1	1530-1600	10
	"	Impactor #2	1624-1634	10

The particulate "catch" consisted of portions: filter, acetone probe washings, and impinger water and water washings. These were turned over to the Union Carbide Corporation laboratory for analysis.

The particle-size distribution was obtained by drawing a 5-10 minute sample thru an eight stage, Sierra Instruments in-stack cascade impactor. In operation the fiberglass filters were allowed to equilibrate in a constant temperature/humidity room before being weighed and placed into numbered petri dishes. At the site, the filters were placed into the impactor, the train was assembled, and the sample was collected.

After the test, the individual filters were placed back into their petri dishes and returned to our Clear Lake, Texas laboratory. The filters were allowed to again equilibrate in the constant temperature/humidity room before final weighing. The "catch" in each stage is the difference between the final and initial weight.

Volumetric Flow Rates

As part of the particulate sampling, the exhaust duct was traversed during every run with stack temperature and velocity head (ΔP) recorded for each point. These data were used, along with moisture content and molecular weight, to calculate average velocity and volumetric flow rate (Equations 1-2, Appendix C). The results appear in Appendix C and are summarized in Table 3.

TABLE 3

VELOCITY AND FLOW RATE RESULTS

Source	Run	Temp. ^{o}R	A_s, ft^2	Vs, fps	Qacfm	Qdscfm
AK Leach Stack	1	515	0.785	66.892	3,151	2,629
	2	515	0.785	67.244	3,167	2,638
	3	515	0.785	67.270	3,168	2,628
Fine Ore Bend	1	530	7.069	57.684	24,466	19,355
	2	530	7.069	57.190	24,257	19,308
	3	530	7.069	56.813	24,097	19,200
YC Dryer Stack	1	593	3.000	16.723	3,010	1,743
	2	578	3.000	15.682	2,823	1,768
	3	566	3.000	21.286	3,831	2,474
Leach Stack	1	590	4.909	9.682	2,852	1,708
	2	590	4.909	7.575	2,231	1,370
	3	490	4.909	7.887	2,323	1,388
Aerofall Stack #1	1	590	2.182	69.810	9,140	5,959
	2	591	2.182	71.668	9,383	6,093
	3	590	2,182	69.710	9,126	5,802
Aerofall #2	1	588	2.182	73.109	9,571	6,260
	2	583	2.182	74.580	9,764	6,332
	3	583	2.182	70.460	9,225	5,872

Table 3 - Continued

Source	Run	Temp. ^{o}R	As, ft^2	Vs, fps	Qacfm	Qdscfm
Aerofall #3	1	580	2.182	73.763	9,657	6,538
	2	578	2.182	71.129	9,312	6,536
	3	583	2.182	72.827	9,535	6,279
Aerofall #4	1	590	2.182	67,092	8,784	5,525
	2	590	2.182	66.292	8,679	5,715
	3	588	2.182	68.893	9,019	5,846

Particulate Emission Rates

The particulate emission rates were obtained by:

$$PER_{lbs/hr} = \frac{\text{Particulate catch, grams}}{454 \text{ grams/lb.}} \times \frac{Qdscfm}{Vm(std)} \times 60 \text{ min/hr.}$$

Where:

Particulate Catch (PC) = Mass of particulate catch, grams

Qdscfm = Stack volumetric flow rate, dry standard cubic feet per minute

Vm(std) = Volume of sample collect, dry standard cubic feet.

The particulate catches used to calculate PER are the filter gains. The laboratory results (including the Ra-226, Th-230, U-Wat, V-205 and Pb-210 analysis) appear in Appendix B. The results of the particulate emission rate calculations are presented in Table 4.

TABLE 4

PARTICULATE EMISSION RATES

Source	Run	Pc,grams	Qdscfm	Vm(std)	PER,lbs/hr.
AK Leach Stack	1	0.5693	2,624	39.630	5.39
	2	0.4342	2,638	36.695	4.13
	3	0.4563	2,628	33.868	4.73
				Average	4.73
Fine Ore Bend	1	0.3652	19,355	29.729	31.42
	2	0.3173	19,308	28.246	28.60
	3	0.3712	19,200	28.363	33.21
				Average	31.10
YC Dryer Stack	1	0.0533	1,743	47.369	0.26
	2	0.0201	1,768	44.939	0.10
	3	0.0498	2,474	48.396	0.37
				Average	0.24
Leach Stack	1	0.2922	1,708	13.357	4.94
	2	0.3691	1,370	23.449	2.85
	3	0.4226	1,388	22.932	3.38
				Average	3.72
Aerofall Stack #1	1	0.3738	5,959	24.019	12.26
	2	0.4316	6,093	26.126	13.30
	3	0.3669	5,802	27.152	10.36
				Average	11.97
Aerofall Stack #2	1	0.0125	6,260	35.049	0.30
	2	-0.0046	6,332	32.090	-
	3	0.3386	5,872	27.411	9.59
				Average	4.95
Aerofall Stack #3	1	0.0594	6,538	55.408	0.93
	2	0.0584	6,536	58.318	0.87
	3	0.2922	6,279	58.552	4.14
				Average	1.98
Aerofall Stack #4	1	0.4375	5,525	27.724	11.52
	2	0.4913	5,715	28.343	13.09
	3	0.5129	5,846	28.022	14.14
				Average	12.92

It is interesting to note that the filters which were tared and final weighed without the petri dishes (YC-1, 2 and 3; Aerofall #2 - 1 and 2; and, Aerofall #3 - 1 and 2) show much lower weight gains than the remainder of the filters. The filter for Aerofall #2 - Run 2, showed a negative weight gain (See Appendix B).

Particle-Size Distribution

Two particle-size samples were collected from each source. The results appear in Table 5. Included are:

1. Cut-size for each stage
2. Weight gain for each stage
3. Percent of total particulate captured by stage
4. Sample volume in dry cubic feet
5. Particulate concentration, by stage, in grains

A K LEACH

Stage	Cut-size Microns	Wt. Collected, Mg	% Total	Grain
0	10.0	2.0	20.2	0.031
1	6.3	1.6	16.2	0.025
2	2.5	1.3	13.1	0.020
3	1.4	2.0	20.2	0.031
4	0.96	1.9	19.2	0.029
5	0.48	0.2	2.0	0.003
6	0.24	0.5	5.0	0.008
7	0.18	0.3	3.0	0.005
8	0.09	0.1	1.0	0.002
F	0.00	0.0	0.0	0.000
4.04 dcf	Total	9.9	Total	0.153

0	10.0	3.8	17.8	0.059
1	6.3	2.5	11.7	0.039
2	2.5	3.1	14.6	0.048
3	1.4	3.7	17.4	0.057
4	0.96	2.7	12.7	0.042
5	0.48	1.5	7.0	0.023
6	0.24	1.4	6.6	0.022
7	0.18	0.9	4.2	0.014
8	0.09	1.7	8.0	0.026
F	0.00	0.0	0.0	0.000
3.96 dcf	Total	21.3	Total	0.328

LEACH STACK

Stage	Cut-size Microns	Wt. Collected, Mg	% Total	Grain
0	14.8	1.4	7.9	0.022
1	9.0	2.9	16.3	0.045
2	3.6	2.0	11.2	0.031
3	2.1	1.7	9.6	0.026
4	1.4	2.1	11.8	0.032
5	0.74	1.2	6.7	0.019
6	0.40	2.0	11.2	0.031
7	0.15	0.0	0.0	0.000
8	0.08	1.5	8.4	0.023
F	0.00	3.0	16.9	0.046
2.15 dcf	Total	17.8	Total	0.274
0	14.8	1.3	8.1	0.020
1	9.0	1.8	11.2	0.028
2	3.6	1.6	9.9	0.025
3	2.1	2.1	13.0	0.032
4	1.4	1.8	11.2	0.038
5	0.74	1.0	6.2	0.015
6	0.40	2.3	14.3	0.035
7	0.15	1.5	9.3	0.023
8	0.08	1.1	6.8	0.017
F	0.00	1.6	9.9	0.025
2.188 dcf	Total	16.1	Total	0.248

YC DRYER

Stage	Cut-size Microns	Wt. Collected, Mg	% Total	Grain
0	8.0	3.2	9.2	0.049
1	5.3	1.7	4.9	0.026
2	3.4	3.5	10.0	0.054
3	1.9	4.1	11.7	0.063
4	0.8	5.5	15.8	0.085
5	0.43	0.0	0.0	0.000
6	0.24	6.8	19.5	0.105
7	0.12	2.4	6.9	0.037
8	0.06	3.9	11.2	0.060
F	0.00	3.8	10.9	0.059
5.766 dcf	Total	34.9	Total	0.538
0	9.0	4.4	10.8	0.068
1	6.0	4.3	10.5	0.066
2	2.8	4.9	12.0	0.076
3	1.4	5.4	13.2	0.083
4	0.92	6.3	15.4	0.097
5	0.45	3.4	8.3	0.052
6	0.22	5.3	13.0	0.082
7	0.15	0.0	0.0	0.000
8	0.08	2.9	7.1	0.045
F	0.00	3.9	9.6	0.060
4.629 dcf	Total	40.8	Total	0.629

FINE ORE BEND

Stage	Cut-size Microns	Wt. Collected, Mg	% Total	Grain
0	10.0	0.9	13.8	0.014
1	6.3	0.6	9.2	0.009
2	2.5	1.0	15.4	0.015
3	1.4	0.6	9.2	0.009
4	0.96	0.3	4.6	0.005
5	0.48	0.9	13.8	0.014
6	0.24	1.0	15.4	0.015
7	0.18	0.0	0.0	0.000
8	0.09	0.0	0.0	0.000
F	0.00	1.2	18.5	0.019
4.09 dcf		Total 6.5		Total 0.100
0	10.0	4.6	8.8	0.071
1	6.3	0.0		0.000
2	2.5	6.0	11.5	0.093
3	1.4	5.4	10.4	0.083
4	0.96	9.6	18.4	0.148
5	0.48	1.1	2.1	0.017
6	0.24	4.7	9.0	0.072
7	0.18	4.3	8.3	0.066
8	0.09	10.0	19.2	0.154
F	0.00	6.4	12.3	0.099
4.07 dcf		Total 52.1		Total 0.803

AEROFALL #1

Stage	Cut-size Microns	Wt. Collected, Mg	% Total	Grain
0	10.0	2.5	9.2	0.039
1	6.3	2.5	9.2	0.039
2	2.5	2.8	10.3	0.043
3	1.4	3.3	12.1	0.051
4	0.96	2.8	10.3	0.043
5	0.48	0.0	0.0	0.000
6	0.24	3.7	13.6	0.057
7	0.18	1.9	7.0	0.029
8	0.09	3.8	14.0	0.059
F	0.00	3.9	14.3	0.060
5.048 dcf	Total	27.2	Total	0.419
0	10.0	2.0	10.7	0.031
1	6.3	1.5	8.0	0.023
2	2.5	2.0	10.7	0.031
3	1.4	1.8	9.6	0.038
4	0.96	2.1	11.2	0.032
5	0.48	2.0	10.7	0.031
6	0.24	2.7	14.4	0.042
7	0.18	0.0	0.0	0.000
8	0.09	1.8	9.6	0.029
F	0.00	2.8	15.0	0.043
4.101 dcf	Total	18.7	Total	0.288

AEROFALL #2

Stage	Cut-size Microns	Collected, Mg.	% Total	Grains
0	10.0	1.6	8.5	0.025
1	6.3	2.1	11.2	0.032
2	2.5	1.8	9.6	0.028
3	1.4	1.0	5.3	0.015
4	0.96	1.9	10.1	0.029
5	0.48	2.0	10.6	0.031
6	0.24	3.0	16.0	0.046
7	0.18	0.0	0.0	0.000
8	0.09	2.7	14.4	0.042
F	0.00	2.7	14.4	0.042
5.276 dcf	Total	18.8	Total	0.290

0	10.0	1.6	9.4	0.025
1	6.3	1.6	9.4	0.025
2	2.5	1.7	9.9	0.026
3	1.4	1.5	8.8	0.023
4	0.96	1.2	7.0	0.019
5	0.48	1.3	7.6	0.020
6	0.24	2.6	15.2	0.040
7	0.18	0.0	0.0	0.000
8	0.09	2.1	11.7	0.031
F	0.00	3.6	21.1	0.056
4.731 dcf	Total	17.1	Total	0.264

AEROFALL #3

Stage	Cut-size Microns	Wt. Collected, Mg.	% Total	Grains
0	10.0	0.8	3.3	0.012
1	6.3	0.0	0.0	0.000
2	2.5	1.0	4.1	0.015
4	0.96	0.3	1.3	0.005
5	0.48	1.5	6.2	0.023
6	0.24	1.5	6.2	0.023
7	0.18	5.1	21.3	0.079
8	0.09	7.8	32.6	0.120
F	0.00	5.9	24.7	0.091
4.709 dcf		Total 23.9	Total	0.369
0	10.0	2.1	6.2	0.032
1	6.3	2.4	7.1	0.037
2	2.5	4.2	12.5	0.065
3	1.4	3.9	11.6	0.060
4	0.96	3.5	10.4	0.054
5	0.48	3.1	9.2	0.048
6	0.24	0.0	0.0	0.000
7	0.18	1.2	3.6	0.019
8	0.09	5.5	16.3	0.085
F	0.00	7.8	23.1	0.120
5.066 dcf		Total 33.7	Total	0.520

AEROFALL #4

Stage	Cut-size Microns	Wt. Collected, Mg.	% Total	Grains
0	10.0	2.5	9.1	0.039
1	6.3	2.7	9.8	0.042
2	2.5	2.7	9.8	0.042
3	1.4	3.3	12.0	0.051
4	0.96	1.8	6.5	0.028
5	0.48	2.3	8.4	0.035
6	0.24	3.1	11.3	0.048
7	0.18	0.0	0.0	0.000
8	0.09	5.3	19.0	0.082
F	0.00	3.8	13.8	0.059
5.149 dcf		Total 27.5	Total	0.424
0	10.0	3.3	10.7	0.051
1	6.3	3.5	11.4	0.054
2	2.5	3.1	10.1	0.048
3	1.4	3.4	11.1	0.052
4	0.96	3.4	11.1	0.052
5	0.48	2.9	9.4	0.045
6	0.24	4.0	13.0	0.062
7	0.18	0.0	0.0	0.000
8	0.09	3.1	10.1	0.048
F	0.00	4.0	13.0	0.062
4.15 dcf		Total 30.7	Total	0.473

APPENDIX A

FIELD DATA SHEETS

STACK SAMPLING FIELD DATA

Plant Name _____ Stack Name Lynch Stack

Date 3/7/80 Oper. _____ Sample # _____ Stack Height 24.79'

Stack dia. (exit) ___ Stack dia. (port) ___ Stack Press. " H_2O ___ Bar. Press. " Hg ___

Probe # _____ PTCF _____ DGMCF _____ Nozzle # 1/8

Nozzle area _____ Filter # _____ Int. wt. gms. _____ Orifice Constants a NA b NA

Meter # _____ K factor NA* Pump # NA

Set 18 Impactor

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
1	10:36	321,253	0.01	.10		46	44	1.0		130	45
	10:41		0.01	.10		50	44	1.0		130	45
	10:46		0.01	.10		53	46	1.0		130	45
		323,403									
2	11:15	323,403	0.01	.10		46	44	1.0		130	38
	11:20		0.01	.10		44	45	1.0		130	39
	11:25		0.01	.10		52	46	1.0		130	40
		325,591									

* Purge where required

Sample Time = _____ Net Volume = _____ Avg. $\sqrt{\Delta P}$ Avg. ΔH Avg. Meter Temp. °F Avg. Stack Temp. °F

*NA - Not Applicable

IMPINGER CATCH

Sample No. _____

Impinger No.	Solution Used	Amount of Solution (ml)	Imp. Tip Configuration	Weight (grams)
1				Final _____ Initial _____ Wt. gain _____
2				Final _____ Initial _____ Wt. gain _____
3				Final _____ Initial 100 Wt. gain _____
4				Final _____ Initial 725.4 Wt. gain _____
				Final _____ Initial _____ Wt. gain _____
6				Final _____ Initial _____ Wt. gain _____
Flask				Final _____ Initial _____ Wt. gain _____

TOTAL WEIGHT GAIN OF IMPINGERS (grams) _____

Date _____

Signature _____

ORSAT ANALYSIS RESULTS

Gas Fractional Part

CO_2 _____

O_2 _____

CO _____

N_2 _____

Date _____

Time _____

Signature _____

NUS CORPORATION

STACK SAMPLING FIELD DATA

Plant Name Union Carbide — Stack Name #3 AERO FALL

Date 3-5-80 — Oper. — Sample # 1 — Stack Height —

Stack dia. (exit) — Stack dia. (port) — Stack Press. " H_2O .91 — Bar. Press. " Hg 24.64

Probe # RAC — PTCF 0.86 — DGMCF 0.99 — Nozzle # 1/4

Nozzle area .00034 — Filter # 0.6737 — Int. wt. gms. — Orifice Constants a NA, b NA

Meter # RAC — K factor NA* — Pump # NA

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn, in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
A1	1:20	910,568	1.1	1.8	250	61	57	1.0	250	120	44
2	1:22	912.570	1.1	1.8	250	66	57	1.0	250	120	44
3	1:24	914,200	1.3	3.0	250	74	58	1.0	250	120	47
4	1:26	916,150	1.3	3.4	250	78	58	1.0	250	120	47
5	1:28	918,34	1.3	3.9	250	83	59	1.0	250	120	48
6	1:30	920.63	1.3	3.9	250	85	59	1.0	250	120	49
7	1:32	923.21	1.3	3.9	250	88	60	1.0	250	120	49
8	1:35	926.60	1.3	3.9	250	90	60	1.0	250	120	44
9	1:38	930.11	1.1	3.6	250	93	63	1.0	250	120	45
10	1:41	933.95	.80	2.4	250	93	64	1.0	250	120	45
A1	1:49	936.313	1.2	3.8	250	90	65	1.0	250	120	46
2	1:53	941.07	1.3	3.9	250	90	65	1.0	250	120	46
3	1:57	946.03	1.4	4.2	250	95	67	1.0	250	120	48
4	2:01	951.53	1.3	3.9	250	96	68	1.0	250	120	48
5	2:05	956	1.3	3.9	250	98	69	1.0	250	120	48
6	2:09	960.28	1.2	3.8	250	99	70	1.0	250	120	49
7	2:13	964.95	1.2	3.8	250	102	71	1.0	250	120	49
8	2:16	968.45	1.2	3.8	250	103	71	1.0	250	120	49
9	2:19	971.96	1.1	3.6	250	104	72	1.0	250	120	49
10	2:22	975.43	.90	2.4	250	104	73	1.0	250	120	50
											51
											51
											52
											52
	2:25	978.352	1,096	3.44		77				120	

Sample Time = 60 — Net Volume: 61.764

Avg. $\sqrt{\Delta P}$ — Avg. ΔH — Avg. Meter Temp. °F — Avg. Stack Temp. °F

*NA - Not Applicable

IMPINGER CATCH

Sample No. 1

Impinger No.	Solution Used	Amount of Solution (ml)	Imp. Tip Configuration	Weight (grams)
1	DI H_2O	100		Final 188 Initial 100 Wt. gain 88
2	DI H_2O	100		Final 117 Initial 100 Wt. gain 17
3	Dry		99'E ~~51'68~~ 03'26	Final 3 Initial 0 Wt. gain 3
4	Silica Gel		5	Final 773.3 Initial 756.1 Wt. gain 17.2
5				Final Initial Wt. gain
6				Final Initial Wt. gain
Flask				Final Initial Wt. gain

TOTAL WEIGHT GAIN OF IMPINGERS (grams) 125.2

Date _____

Signature _____

ORSAT ANALYSIS RESULTS

Gas Fractional Part

CO_2 _____

O_2 _____

CO _____

N_2 _____

Date _____

Time _____

Signature _____ NUS CORPORATION

STACK SAMPLING FIELD DATA

Plant Name [illegible] Stack Name Aerollo Sample 2

Date 3-5-80 Oper. J.D.S. Sample # 2 Stack Height

Stack dia. (exit) Stack dia. (port) Stack Press. " H_2O 0.50 Bar. Press. " Hg 24.64

Probe # PTCF 0.86 DGMCF 0.99 Nozzle # 4

Nozzle area .00034 Filter # Int. wt. gms. 0.6732 Orifice Constants a NA b NA

Meter # K factor NA* Pump # NA

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Ht. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
B 1	5:04	981.927	1.1	3.6	250	53	49	1.0	250	116	38
2	5:12	985.53	1.4	4.2	250	66	50	1.0	250	116	38
3	5:15	989.14	1.3	3.9	250	63	51	1.0	250	116	39
4	5:18	992.8	1.2	3.8	250	80	52	1.0	250	116	39
5	5:21	996.39	1.1	3.6	250	84	53	1.0	250	116	39
6	5:24	999.50	1.1	3.6	250	87	55	1.0	250	116	41
7	5:27	1003.23	1.1	3.6	250	91	56	1.0	250	116	41
8	5:30	1006.76	1.1	3.6	250	92	58	1.0	250	116	42
9	5:33	1010.31	.9	2.4	250	95	60	1.0	250	116	42
10	5:36	1013.43	.7	2.1	250	90	61	1.0	250	116	42
A 1	5:54	1016.135	1.2	3.8	250	69	59	1.0	250	120	41
2	5:57	1020.13	1.2	3.8	250	80	60	1.0	250	120	41
3	6:00	1023.76	1.3	3.9	250	85	60	1.0	250	120	41
4	6:03	1027.51	1.2	3.8	250	89	61	1.0	250	120	41
5	6:06	1031.14	1.2	3.8	250	91	61	1.0	250	120	42
6	6:09	1034.77	1.2	3.8	250	93	62	1.0	250	120	42
7	6:12	1038.43	1.2	3.8	250	95	63	1.0	250	120	42
8	6:15	1042.04	1.2	3.8	250	98	65	1.0	250	120	43
9	6:18	1045.67	1.2	3.8	250	100	65	1.0	250	120	43
10	6:21	1049.35	.9	2.4	250	101	66	1.0	250	120	43
	6:24	1052.95	1.065	3.56		71.7				118	

Sample Time = 60 Net Volume: 70.626 Avg. $\sqrt{\Delta P}$ Avg. ΔH Avg. Meter Temp. °F Avg. Stack Temp. °F

* Purge where required

NA - Not Applicable

6.506

Check .003 cfm

IMPINGER CATCH

Sample No. Stack #3 Sample #2

Impinger No.	Solution Used	Amount of Solution (ml)	Imp. Tip Configuration	Weight (grams)
1	DI H_2O			Final 262 Initial 100 Wt. gain
2	DI H_2O			Final 110 Initial 100 Wt. gain
3	BLANK			Final 2 Initial 0 Wt. gain
4	Silica Gel			Final 747.2 Initial 733.6 Wt. gain
5				Final Initial Wt. gain
6				Final Initial Wt. gain
Flask				Final Initial Wt. gain

TOTAL WEIGHT GAIN OF IMPINGERS (grams) 87.6

Date

Signature

ORSAT ANALYSIS RESULTS

Gas Fractional Part

CO_2 0

O_2

CO

N_2

Date

Time

Signature

STACK SAMPLING FIELD DATA

Plant Name _____ Stack Name Acetate #3

Date 3-6-80 Oper. J.D.S. Sample # 3 Stack Height _____

Stack dia. (exit) ___ Stack dia. (port) ___ Stack Press. " H_2O 0.91 Bar. Press. " Hg 24.56

Probe # _____ PTCF 0.86 DGMCF 0.99 Nozzle # 14

Nozzle area .00034 Filter # 3006 Int. wt. gms. _____ Orifice Constants a NA b NA

Meter # RAC K factor NA* Pump # NA

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
B1	5:05	155.90	1.3	3.9	250	47	45	1.0	250	123	39
2	5:08	159.62	1.3	3.9	250	57	45	1.0	250	123	39
3	5:11	163.15	1.4	4.2	250	65	45	1.0	250	123	39
4	5:14	166.69	1.4	4.2	250	69	46	1.0	250	123	39
5	5:17	170.25	1.3	3.9	250	73	47	1.0	250	123	39
6	5:20	173.69	1.2	3.8	250	76	48	1.0	250	123	40
7	5:23	177.11	1.3	3.9	250	78	49	1.0	250	123	40
8	5:26	180.55	1.2	3.8	250	80	50	1.0	250	123	40
9	5:29	183.98	1.1	3.6	250	82	52	1.0	250	123	40
10	5:31	187.44	1.1	3.6	250	83	53	1.0	250	123	40
											~~40~~
11	5:38	191.027	1.1	3.6	250	73	53	1.0	250	123	41
2	5:41	194.42	1.1	3.6	250	77	53	1.0	250	123	41
3	5:44	197.74	1.0	3.4	250	79	54	1.0	250	123	41
4	5:47	201.14	1.1	3.6	250	83	55	1.0	250	123	41
5	5:50	204.52	1.4	4.2	250	84	56	1.0	250	123	42
6	5:53	208.12	1.4	4.2	250	87	57	1.0	250	123	42
7	5:56	211.74	1.4	4.2	250	89	58	1.0	250	123	42
8	5:59	215.37	1.3	3.9	250	92	60	1.0	250	123	42
9	6:02	218.77	1.3	3.9	250	92	60	1.0	250	123	42
10	6:05	222.38	1.1	3.6	250	93	61	1.0	250	123	43
	5:08	225.5[illegible]	1.095	3.85		65				17.3	

Sample Time = 60

Net Volume: _____

Avg. $\sqrt{\Delta P}$ | Avg. ΔH | Avg. Meter Temp. °F | Avg. Stack Temp. °F

* Purge where required

*NA - Not Applicable

IMPINGER CATCH

Sample No. _____

Impinger No.	Solution Used	Amount of Solution (ml)	Imp. Tip Configuration	Weight (grams)
1	_____	_____	_____	Final 229 Initial 100 Wt. gain 129
2	_____	_____	_____	Final 119 Initial 100 Wt. gain 19
3	_____	_____	_____	Final _____ Initial 0 Wt. gain _____
4	SILICA GEL	_____	_____	Final 748.5 Initial 733.7 Wt. gain 14.8
5	_____	_____	_____	Final _____ Initial _____ Wt. gain _____
6	_____	_____	_____	Final _____ Initial _____ Wt. gain _____
Flask	_____		_____	Final _____ Initial _____ Wt. gain _____

TOTAL WEIGHT GAIN OF IMPINGERS (grams) _____

Date _____

Signature _____

ORSAT ANALYSIS RESULTS

Gas	Fractional Part
CO_2	_____
O_2	_____
CO	_____
N_2	_____

Date _____

Time _____

Signature _____ NUS CORRORATION

STACK SAMPLING FIELD DATA

Plant Name _____ Stack Name #3 Hopkins

Date 3-5-80 Oper. T.D.S. Sample # 1 Stack Height _____

Stack dia. (exit) ___ Stack dia. (port) ___ Stack Press. " H_2O ___ Bar. Press. " Hg ___

Probe # _____ PTCF .86 DGMCF 0.99 Nozzle # 9/32

Nozzle area _____ Filter # Set 9 Int. wt. gms. _____ Orifice a NA

Meter # _____ K factor NA* Pump # NA Constants b NA

Impactor

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature		L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
						Inlet	Outlet				
1	6:47	52.863	1.2	~~2.38~~		64	60	1.0			37
	6:48			.93		66	61	1.0			37
	6:49			1.0		61	67	1.0			37
	6:52			0.94		71	61	1.0			37
	6:54			0.85		71	61	1.0			37
	6:55			0.90		71	61	1.0			37
	6:56			0.95		72	61	1.0			38
	6:56½			0.90		72	61	1.0			~~38~~
		58.429									

* Purge where required

Sample Time = _____ Net Volume = _____ Avg. $\sqrt{\Delta P}$ | Avg. ΔH | Avg. Meter Temp. °F | Avg. Stack Temp. °F

*NA - Not Applicable

IMPINGER CATCH

Impactor

Sample No. _____

Impinger No.	Solution Used	Amount of Solution (ml)	Imp. Tip Configuration	Weight (grams)
1				Final 110 Initial 100 Wt. gain 10
2	2-1 Silica gel			Final 699.2 Initial 699.4 Wt. gain
3				Final Initial Wt. gain
4				Final Initial Wt. gain
5				Final Initial Wt. gain
6				Final Initial Wt. gain
Flask				Final Initial Wt. gain

TOTAL WEIGHT GAIN OF IMPINGERS (grams) _____

Date _____

Signature _____

ORSAT ANALYSIS RESULTS

Gas Fractional Part

CO_2 _____

O_2 _____

CO _____

N_2 _____

Date _____

Time _____

Signature _____

STACK SAMPLING FIELD DATA

Plant Name _____ Stack Name Aerofoil #3

Date 3-6-80 Oper. _____ Sample # 2 Stack Height _____

Stack dia. (exit) ___ Stack dia. (port) ___ Stack Press. " H_2O ___ Bar. Press. " Hg ___

Probe # _____ PTCF _____ DGMCF _____ Nozzle # 1/8

Nozzle area _____ Filter # Set 5 Int. wt. gms. _____ Orifice Constants a NA b NA

Meter # _____ K factor NA* Pump # NA

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
1	6:22	225,583	1.3	.61		60	58			123	
	6:25		1.3	.60		62	58			123	
	6:27		1.3	.53		62	58			123	
	6:28		1.3	.49		62	58			123	
	6:32	230,512									

* Purge where required

Sample Time = _____ Net Volume = _____ Avg. $\sqrt{\Delta P}$ Avg. ΔH Avg. Meter Temp. °F Avg. Stack Temp. °F

*NA - Not Applicable

IMPINGER CATCH

Sample No. _____

Impinger No.	Solution Used	Amount of Solution (ml)	Imp. Tip Configuration	Weight (grams)
1				Final 227 Initial 200 Wt. gain
2				Final 229.114 Initial 200 Wt. gain
3				Final 114 Initial 100 Wt. gain
4				Final 731.4 Initial 730.1 Wt. gain
5				Final Initial Wt. gain
6				Final Initial Wt. gain
Flask				Final Initial Wt. gain

TOTAL WEIGHT GAIN OF IMPINGERS (grams) _____

Date _____

Signature _____

ORSAT ANALYSIS RESULTS

Gas Fractional Part

CO_2 _____

O_2 _____

CO _____

N_2 _____

Date _____

Time _____

Signature _____

STACK SAMPLING FIELD DATA Jay

Plant Name Olmon - Carbide Stack Name Aerofall 4B

Date 3-6-80 Oper. PSC Sample # 1 Stack Height

Stack dia. (exit) Stack dia. (port) Stack Press. " H_2O 0.81 Bar. Press. " Hg 24.86

Probe # PTCF DGMCF Nozzle #

Nozzle area 0.00018 Filter # 212 Int. wt. gms. Orifice Constants a NA b NA

Meter # K factor NA* 0.384 Pump # NA

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F	ΔP
A-1	8:03	2492.00	0.80	0.31		50	51	4.0	263	130	52	1.15
2	6	2493.52	1.05	0.40		50	52	5.0	281	130	52	1.20
3	9	2495.36	1.25	0.48		52	54	6.0	247	130	52	1.20
4	12	2497.18	1.20	0.46		53	54	5.5	258	130	52	1.15
5	15	2499.99	1.25	0.48		55	57	6.0	248	130	52	0.98
6	18	2500.81	1.10	0.42		57	59	5.0	240	130	52	1.15
7	21	2502.64	1.15	0.44		58	59	5.0	228	130	52	
8	24	2504.43	1.05	0.40		60	62	5.0	230	130	52	
9	27	2506.19	0.92	0.35		61	62	4.0	238	130	52	[Δp=1.07]
10	30	2507.74	0.72	0.28		63	66	3.0	228	130	52	
	33	2509.18										Δp=1.147
B-1	38	2509.18	0.77	0.30		57	58	3.5	270	130	52	
2	41	2510.58	0.86	0.33		59	61	4.0	268	130	52	130°F
3	44	2512.21	1.00	0.38		60	63	4.0	255	130	52	
4	47	2513.77	1.15	0.44		61	63	5.0	262	130	52	
5	50	2515.42	1.20	0.46		62	65	5.0	250	130	52	
6	53	2517.19	1.25	0.48		62	66	5.0	264	130	52	
7	56	2518.89	1.20	0.46		63	66	5.0	241	130	52	
8	59	2520.60	1.10	0.42		65	69	4.5	250	130	52	
9	9:02	2522.30	1.05	0.40		67	70	4.0	258	130	52	
10	05	2523.87	0.84	0.32		70	73	3.5	269	130	52	
	08	2525.37										
				Leak OK @ 8" Hg <0.01 CFM								
Purge here required												
			1.019	0.40		60°				130		
Sample Time = 60			Avg. $\sqrt{\Delta P}$	Avg. ΔH		Avg. Meter Temp. °F				Avg. Stack Temp. °F		
Net Volume: 33.37												

*NA - Not Applicable

IMPINGER CATCH

Sample No. _____

Impinger No.	Solution Used	Amount of Solution (ml)	Imp. Tip Configuration	Weight (grams)
1				Final 170 Initial 100 Wt. gain 70
2				Final 120 Initial 100 Wt. gain 20
3				Final 3 Initial 0 Wt. gain 3
4	Silica Gel		S	Final 783.8 Initial 776.4 Wt. gain 7.4
5				Final Initial Wt. gain
6				Final Initial Wt. gain
Flask				Final Initial Wt. gain

TOTAL WEIGHT GAIN OF IMPINGERS (grams) _____

Date _____

Signature _____

ORSAT ANALYSIS RESULTS

Gas Fractional Part

CO_2 _____

O_2 _____

CO _____

N_2 _____

Date _____

Time _____

Signature _____

STACK SAMPLING FIELD DATA

Plant Name _____ Stack Name Aerotail #4

Date 3/6/80 Oper. PSL Sample # 2 Stack Height _____

Stack dia. (exit) ___ Stack dia. (port) ___ Stack Press. " H_2O ___ Bar. Press. " Hg ___

Probe # _____ PTCF _____ DGMCF _____ Nozzle # _____

Nozzle area _____ Filter # 207 Int. wt. gms. _____ Orifice Constants a NA b NA

Meter # _____ K factor NA* Pump # NA

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
B-1	0743	2525.52	0.79	0.30	46	47	51	1.0	232	130	47
2	6	2528.25	0.68	0.26	42	50	52	1.0	262	130	47
3	9	2529.84	0.42	0.38	42	54	56	1.5	250	130	47
4	12	2531.60	1.05	0.41	42	54	57	2.0	243	130	47
5	15	2533.31	1.05	0.41	43	55	59	2.0	239	130	47
6	18	2535.10	1.25	0.48	38	57	60	2.0	250	130	47
7	21	2537.05	1.25	0.48	36	59	61	2.0	247	130	47
8	24	2538.89	1.15	0.44	39	60	63	2.0	238	130	47
9	27	2539.96	1.00	0.38	41	62	65	2.0	244	130	47
10	30	2541.53	0.82	0.31	44	65	67	2.0	239	130	47
	33	2543.16			47						
#1	51	2543.46	0.78	0.30		56	60	1.0	250	130	47
2	54	2544.50	0.96	0.38		56	61	2.0	236	130	47
3	57	2546.10	1.15	0.44		57	61	2.0	242	130	47
4	11:00	2547.79	1.20	0.46		60	65	2.0	240	130	47
5	3	2549.55	1.25	0.48		61	64	2.0	228	130	47
6	6	2551.39	1.25	0.48		63	67	2.0	249	130	47
7	9	2553.17	1.20	0.46		64	69	2.0	267	130	47
8	12	2554.87	1.15	0.44		66	70	2.0	270	130	47
9	15	2556.59	0.94	0.36		66	71	1.5	255	130	47
10	18	2558.19	0.88	0.34		69	73	1.0	238	130	47
	21	2559.70									
				Leak	ck	@	8"	0.04			
			1.015	0.40		61		Filter loose		130	

* Purge where required

Sample Time = 60 Net Volume: 34.18

Avg. $\sqrt{\Delta P}$ Avg. ΔH Avg. Meter Temp. °F Avg. Stack Temp. °F

after tightening < 0.01

*NA - Not Applicable

IMPINGER CATCH

Sample No. _____

Impinger No.	Solution Used	Amount of Solution (ml)	Imp. Tip Configuration	Weight (grams)
1				Final 154 Initial 100 Wt. gain 54
2				Final 108 Initial 100 Wt. gain 8
3				Final 5 Initial 0 Wt. gain 5
4	Silica Gel		S	Final 729.5 Initial 725.0 Wt. gain 4.5
5				Final Initial Wt. gain
6				Final Initial Wt. gain
Flask				Final Initial Wt. gain

TOTAL WEIGHT GAIN OF IMPINGERS (grams) 71.5

Date _____

Signature _____

ORSAT ANALYSIS RESULTS

Gas Fractional Part

CO_2 _____

O_2 _____

CO _____

N_2 _____

Date _____

Time _____

Signature _____

STACK SAMPLING FIELD DATA

Plant Name _____ Stack Name #4 AERO FALL

Date 3/6/80 Oper. PSC Sample # 3 Stack Height _____

Stack dia. (exit) ___ Stack dia. (port) ___ Stack Press. " H_2O ___ Bar. Press. " Hg ___

Probe # _____ PTCF _____ DGMCF _____ Nozzle # _____

Nozzle area _____ Filter # 3005 Int. wt. gms. _____ Orifice Constants a NA b NA

Meter # 704 K factor NA* .384 Pump # NA

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
A-1	12:56	2561.50	1.15	0.45		53	55	3.0	238	128	52
2	59	2563.25	1.25	0.48		55	57	3.0	253	128	52
3	1:02	2565.17	1.15	0.45		56	58	3.0	268	128	52
4	5	2566.68	1.25	0.48		57	60	3.0	270	128	52
5	8	2568.45	1.30	0.50		59	62	3.5	260	128	52
6	11	2570.27	1.25	0.48		61	65	3.0	252	128	52
7	14	2572.04	1.15	0.45		62	65	3.0	246	128	52
8	17	2573.76	1.15	0.45		63	67	3.0	238	128	52
9	20	2575.48	0.98	0.38		65	69	3.0	230	128	52
10	23	2577.18	0.84	0.32		67	71	2.5	228	129	52
	26	2578.64									
B-1	1:31	2578.64	0.91	0.35		62	6	2.5	242	128	52
2	34	2580.19	1.00	0.38		64	61	3.0	262	128	52
3	37	2581.70	1.05	0.41		65	67	3.0	258	128	52
4	40	2583.44	1.15	0.45		66	68	3.0	250	128	52
5	43	2585.23	1.20	0.46		67	69	3.0	270	128	52
6	46	2586.93	1.25	0.48		68	70	3.0	254	128	52
7	49	2588.70	1.25	0.48		70	72	3.0	260	128	52
8	52	2590.51	1.15	0.45		71	73	3.0	262	128	52
9	55	2592.31	0.98	0.38		72	75	2.5	251	128	52
10	58	2593.98	0.86	0.33		72	77	2.5	247	128	52
	1:01	2595.55									
				Leak ck @ 0"				NO Leak			
			1.053	0.43		65				128	

* Purge where required

Sample Time = 60 Net Volume: 34.05

Avg. √ΔP | Avg. ΔH | Avg. Meter Temp. °F | Avg. Stack Temp. °F

*NA - Not Applicable

IMPINGER CATCH

Sample No. _____

Impinger No.	Solution Used	Amount of Solution (ml)	Imp. Tip Configuration	Weight (grams)
1				Final 161 Initial 100 Wt. gain 61
2				Final 113 Initial 100 Wt. gain 13
3				Final 3 Initial 0 Wt. gain 3
4				Final 790.0 Initial 783.8 Wt. gain 6.2
5				Final _____ Initial _____ Wt. gain _____
6				Final _____ Initial _____ Wt. gain _____
Flask				Final _____ Initial _____ Wt. gain _____

TOTAL WEIGHT GAIN OF IMPINGERS (grams) _____

Date _____

Signature _____

ORSAT ANALYSIS RESULTS

Gas Fractional Part

CO_2 _____

O_2 _____

CO _____

N_2 _____

Date _____

Time _____

Signature _____

STACK SAMPLING FIELD DATA

Plant Name _____ Stack Name #4 REBOILER

Date 3-6-80 Oper. J.D.S. Sample # #1 Stack Height _____

Stack dia. (exit) ___ Stack dia. (port) ___ Stack Press. " H_2O ___ Bar. Press. " Hg ___

Probe # _____ PTCF 0.86 DGMCF _____ Nozzle # 6

Nozzle area _____ Filter # Set 10 Int. wt. gms. _____ Orifice Constants a N/ _____ b NA

Meter # _____ K factor NA* Pump # NA

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
1	~~3:13~~	~~150,662~~	1.2	.61		52	51	1.0		130	49
	3:14	150,935									
	3:19		1.2	.60		60	51	1.0		130	60
	3:24	155,841	1.2	.60		62	52	1.0		130	61

* Purge where required

Sample Time = _____ Net Volume = _____ Avg. $\sqrt{\Delta P}$ Avg. ΔH Avg. Meter Temp. °F Avg. Stack Temp. °F

*NA - Not Applicable

IMPINGER CATCH

Sample No. _____

Impinger No.	Solution Used	Amount of Solution (ml)	Imp. Tip Configuration	Weight (grams)
1	Silica Gel			Final 509.803 Initial 729.5 Wt. gain
2	DI H_2O			Final 36 Initial 100 Wt. gain
3				Final Initial Wt. gain
2-24 SIK				Final Initial Wt. gain
5				Final Initial Wt. gain
6				Final Initial Wt. gain
Flask				Final Initial Wt. gain

TOTAL WEIGHT GAIN OF IMPINGERS (grams) _____

Date _____

Signature _____

ORSAT ANALYSIS RESULTS

Gas Fractional Part

CO_2 _____

O_2 _____

CO _____

N_2 _____

Date _____

Time _____

Signature _____ NUS CORPORATION

STACK SAMPLING FIELD DATA

Plant Name _____ Stack Name #4 ACKOFALL

Date 3-7-80 Oper. _____ Sample # 2 Stack Height _____

Stack dia. (exit) ___ Stack dia. (port) ___ Stack Press. " H_2O 0.81 Bar. Press. " Hg 24.56

Probe # _____ PTCF _____ DGMCF 0.99 Nozzle # 1/8

Nozzle area _____ Filter # Set #17 Int. wt. gms. _____ Orifice Constants a NA b NA

Meter # RHC K factor NA* Pump # NA

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
1	8:34	230.354	1.05	0.55		34	37	1.0		130	35
	8:36		1.05	.43		43	37	1.0		130	35
	8:39		1.05	.43		45	37	1.0		130	35
	8:41		1.05	.41		47	38	1.0		130	35
		235.008									

Sample Time = _____ Net Volume: _____ Avg. $\sqrt{\Delta P}$ Avg. ΔH Avg. Meter Temp. °F Avg. Stack Temp. °F

* Purge where required

*NA - Not Applicable

IMPINGER CATCH

Sample No. _____

Impinger No.	Solution Used	Amount of Solution (ml)	Imp. Tip Configuration	Weight (grams)
1	_____	_____	_____	Final _____ Initial _____ Wt. gain _____
2	_____	_____	_____	Final _____ Initial _____ Wt. gain _____
3	_____	_____	_____	Final 103 Initial 100 Wt. gain 3
4	_____	_____	_____	Final _____ Initial 7534 Wt. gain _____
5	_____	_____	_____	Final _____ Initial _____ Wt. gain _____
6	_____	_____	_____	Final _____ Initial _____ Wt. gain _____
Flask	_____		_____	Final _____ Initial _____ Wt. gain _____

TOTAL WEIGHT GAIN OF IMPINGERS (grams) _____

Date _____

Signature _____

ORSAT ANALYSIS RESULTS

Gas Fractional Part

CO_2 _____

O_2 _____

CO _____

N_2 _____

Date _____

Time _____

Signature _____

STACK SAMPLING FIELD DATA

Plant Name _____ Stack Name # 4 ACKOFALL

Date 3-7-80 Oper. _____ Sample # 2 Stack Height _____

Stack dia. (exit) ___ Stack dia. (port) ___ Stack Press. " H_2O 0.51 Bar. Press. " Hg 24.56

Probe # _____ PTCF _____ DGMCF 0.99 Nozzle # 1/8

Nozzle area _____ Filter # Sot #17 Int. wt. gms. _____ Orifice a NA

Meter # RHC K factor NA* Pump # NA Constants b NA

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature		L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
						Inlet	Outlet				
1	8:34	230.554	1.05	0.55		39	37	1.0		130	35
	8:36		1.05	.43		43	37	1.0		130	35
	8:39		1.05	.43		45	37	1.0		130	38
	8:41		1.05	.41		47	38	1.0		130	38
		235.008									

factor

* Purge where required

Sample Time = _____ Net Volume: _____ Avg. $\sqrt{\Delta P}$ _____ Avg. ΔH _____ Avg. Meter Temp. °F _____ Avg. Stack Temp. °F _____

*NA - Not Applicable

IMPINGER CATCH

Sample No. _____

Impinger No.	Solution Used	Amount of Solution (ml)	Imp. Tip Configuration	Weight (grams)
1	_____	_____	_____	Final _____ Initial _____ Wt. gain _____
2	_____	_____	_____	Final _____ Initial _____ Wt. gain _____
3	_____	_____	_____	Final 103 Initial 100 Wt. gain 3
4	_____	_____	_____	Final _____ Initial 753.4 Wt. gain _____
5	_____	_____	_____	Final _____ Initial _____ Wt. gain _____
6	_____	_____	_____	Final _____ Initial _____ Wt. gain _____
Flask	_____		_____	Final _____ Initial _____ Wt. gain _____

TOTAL WEIGHT GAIN OF IMPINGERS (grams) _____

Date _____

Signature _____

ORSAT ANALYSIS RESULTS

Gas Fractional Part

CO_2 _____

O_2 _____

CO _____

N_2 _____

Date _____

Time _____

Signature _____ NUS CORPORATION

STACK SAMPLING FIELD DATA

Plant Name Union - Carbide — Stack Name AK Leach Stack

Date 3-7-80 — Oper. PSC — Sample # 1 — Stack Height ____

Stack dia. (exit) ____ — Stack dia. (port) ____ — Stack Press. " H_2O -0.92 — Bar. Press. " Hg ____

Probe # ____ — PTCF ____ — DGMCF ____ — Nozzle # ____

Nozzle area 0.00018 — Filter # 3013 — Int. wt. gms. ____ — Orifice Constants: a NA, b NA

Meter # Dry — K factor NA*0.516 — Pump # NA

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
A-1	7:04	2778.15	1.30	0.67		49	50	8.0	250	55	30
2	11	2784.96	1.25	0.65		50	50	7.0	250	55	30
3	18	2791.12	1.35	0.70		51	55	7.5	250	55	30
4	25	2797.32	1.20	0.62		52	55	7.0	250	55	30
	32	2803.28									
B-1	7:42	2803.28	1.25	0.65		52	55	7.0	250	55	30
2	49	2808.92	1.30	0.67		56	60	7.0	250	55	30
3	56	2815.70	1.20	0.62		60	62	6.0	250	55	30
4	8:03	2820.44	1.10	0.57		60	62	5.0	250	55	30
	10	2825.30									
				leak check @ 9" Hg < 0.01 CFM							
	56	47.15	1.115	0.64		55				55	
	Sample Time:		Avg. $\sqrt{\Delta P}$	Avg. ΔH		Avg. Meter Temp. °F				Avg. Stack Temp. °F	
	Net Volume:										

• Purge where required

*NA - Not Applicable

IMPINGER CATCH

Sample No. 1

Impinger No.	Solution Used	Amount of Solution (ml)	Imp. Tip Configuration	Weight (grams)
1	DI H_2O			Final ____ Initial 100 Wt. gain ____
2	DI H_2O			Final ____ Initial 100 Wt. gain ____
3	BLANK			Final ____ Initial 0 Wt. gain ____
4	SILICA GEL			Final ____ Initial 738.3 Wt. gain ____
5				Final ____ Initial ____ Wt. gain ____
6				Final ____ Initial ____ Wt. gain ____
Flask				Final ____ Initial ____ Wt. gain ____

TOTAL WEIGHT GAIN OF IMPINGERS (grams) ____

Date ____

Signature ____

ORSAT ANALYSIS RESULTS

Gas Fractional Part

CO_2 ____

O_2 ____

CO ____

N_2 ____

Date ____

Time ____

Signature ____ NUS CORPORATION

STACK SAMPLING FIELD DATA

Plant Name Union Carbide — Stack Name YC Dryer STACK

Date 3-4-80 — Oper. T.O.S + R.A.C — Sample # 1 — Stack Height ____

Stack dia. (exit) 6'x3' — Stack dia. (port) ____ — Stack Press. " H_2O .03 — Bar. Press. " Hg 24.57

Probe # ____ — PTCF 0.86 — DGMCF 0.99 — Nozzle # 3/8

Nozzle area .00067 — Filter # ~~2 4 5~~ — Int. wt. gms. 0.6673 — Orifice Constants: a NA, b NA

Meter # RAC — K factor NA* — Pump # NA

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
A1	12:52	703.576	.06	0.78	250	50	49	1.0	~~250~~	133	~~45~~
2	12:56	710.19	.06	0.95	250	62	49	1.0	250	133	45
3	12:58	711.30	.05	1.10	250	62	49	1.0	250	133	45
4	1:00	712.63	.06	1.05	250	62	49	1.0	250	133	45
5	1:02	713.84	.06	1.05	250	67	49	1.0	250	133	45
6	1:04	715.05	.06	1.05	250	66	49	1.0	250	133	45
7	1:06	716.24	.06	1.05	250	68	50	1.0	250	133	45
8	1:08	717.44	.06	1.05	250	70	50	1.0	250	133	45
9	1:10	718.64	.06	1.05	250	72	51	1.0	250	133	45
10	1:12	719.964	.07	1.4	250	76	52	1.0	250	133	44
11	1:14	721.34	.06	1.05	250	78	53	1.0	250	133	44
12	1:16	722.57	.06	1.05	250	80	53	1.0	250	133	44
13	1:18	723.83	.06	1.05	250	81	54	1.0	250	133	44
14	1:20	725.05	.06	1.05	250	82	55	1.0	250	133	44
15	1:22	726.43	.07	1.3	250	85	56	1.0	250	133	44
16	1:24	727.83	.07	1.3	250	87	57	1.0	250	133	44
17	1:26	729.20	.07	1.3	250	88	58	1.0	250	133	45
18	1:28	730.58	.07	1.3	250	89	59	1.0	250	133	44
19	1:30	731.96	.07	1.3	250	90	60	1.0	250	133	44
20	1:32	733.20	.06	1.05	250	90	61	1.0	250	133	45
21	1:34	734.42	.06	1.05	250	91	62	1.0	250	133	45
22	1:36	735.64	.06	1.05	250	91	62	1.0	250	133	45
23	1:38	736.64	.04	0.72	250	90	64	1.0	250	133	45
24	1:40	737.53	.02	0.37	250	89	65	1.0	250	133	45
* Purge where required											
Sample Time:		738.211	0.240			~~74~~ 75.3				133	
Net Volume:			Avg. $\sqrt{\Delta P}$ 351	Avg. ΔH		Avg. Meter Temp. °F				Avg. Stack Temp. °F	

*NA - Not Applicable

66.63

3179

IMPINGER CATCH

Sample No. _____

Final Vol.

Impinger No.	Solution Used	Amount of Solution (ml)	~~Imp. Tip~~ Configuration	Weight (grams)
1	DI	100 mL	285 ml	Final 285 Initial 100 Wt. gain 185
2	DI	100 mL		Final 152 Initial 100 Wt. gain 52
3	~~DI~~ Blank			Final 8 Initial 0 Wt. gain 8
4	Silica Gel			Final 729.5 Initial 710.5 Wt. gain 19.0
5				Final Initial Wt. gain
6				Final Initial Wt. gain
Flask				Final Initial Wt. gain

TOTAL WEIGHT GAIN OF IMPINGERS (grams) 264 ml

Date _____

Signature _____

ORSAT ANALYSIS RESULTS

Gas Fractional Part

CO_2 _____

O_2 _____

CO _____

N_2 _____

Date _____

Time _____

Signature _____

STACK SAMPLING FIELD DATA

Plant Name Union Carbide — Stack Name YC Oxon Stack

Date 3-4-80 — Oper. J.D.S. + RAC — Sample # 1 — Stack Height ____

Stack dia. (exit) ____ — Stack dia. (port) ____ — Stack Press. " H_2O .03 — Bar. Press. " Hg 29.57

Probe # ____ — PTCF 0.86 — DGMCF 0.996 — Nozzle # 3/8

Nozzle area .000767 — Filter # ____ — Int. wt. gms. ____ — Orifice Constants: a NA ~~1.912~~

Meter # ~~Joy~~ RAC — K factor NA* — Pump # NA — b NA ~~2.088~~

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
61	1:49	738.211	.05	.87	250	82	66	1.0	250	133	54
2	1:51	739.28	.05	.87	250	84	67	1.0	250	133	54
3	1:53	740.40	.05	.87	250	86	68	1.0	250	133	54
4	1:55	741.52	.05	.87	250	88	68	1.0	250	133	54
5	1:57	742.63	.04	.72	250	89	69	1.0	250	133	54
6	1:59	743.66	.05	.87	250	90	69	1.0	250	133	54
7	2:01	744.76	.06	1.05	250	92	70	1.0	250	133	54
8	2:03	745.96	.07	1.3	250	93	70	1.0	250	133	56
9	2:05	747.33	.08	1.7	250	95	71	1.0	250	133	56
10	2:07	748.88	.05	1.7	250	96	72	1.0	250	133	56
11	2:09	750.41	.08	1.7	250	97	72	1.0	250	133	58
12	2:11	751.94	.08	1.7	250	98	72	1.0	250	133	58
13	2:13	753.48	.07	1.3	250	99	74	1.0	250	133	59
14	2:15	754.86	.07	1.3	250	99	74	1.0	250	133	59
15	2:17	756.23	.06	1.05	250	100	75	1.0	250	133	59
16	2:19	757.46	.06	1.05	250	100	75	1.0	250	133	59
17	2:21	758.67	.06	1.05	250	100	76	1.0	250	133	59
18	2:23	759.89	.06	1.05	250	100	76	1.0	250	133	59
19	2:25	761.10	.06	1.05	250	100	76	1.0	250	133	61
20	2:27	762.34	.06	1.05	250	100	77	1.0	250	133	61
21	2:29	763.56	.06	1.05	250	102	78	1.0	250	133	61
22	2:31	764.69	.05	.87	250	102	78	1.0	250	133	61
23	2:33	765.46	.02	.37	250	102	79	1.0	250	133	62
24	2:35	766.21	.02	.37	250	100	80	1.0	250	133	63
		766.996	0.240	1.07		75				133	

check accts cfm "115

* Purge where required

Sample Time = 96 — Net Volume: 58.12 — Avg. $\sqrt{\Delta P}$ — Avg. ΔH — Avg. Meter Temp. °F — Avg. Stack Temp. °F

*NA - Not Applicable

7677

moisture = 21.0 %

BGO = 0.79

STACK SAMPLING FIELD DATA

Plant Name Union Carbide — Stack Name Y C Dayca Stack

Date 7-4-80 — Oper. T.D.S. — Sample # 2 — Stack Height ____

Stack dia. (exit) ___ — Stack dia. (port) ___ — Stack Press. " H_2O .03 — Bar. Press. " Hg 24.57

Probe # AAC — PTCF .86 — DGMCF 0.99 — Nozzle # 3/8

Nozzle area .000767 — Filter # ____ — Int. wt. gms. 0.6700 — Orifice Constants: a NA, b NA

Meter # AAC — K factor NA* — Pump # NA

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
A1	4:29	779.404	.05	.87	250	72	64	1.0	250	118	45
2	4:31	780.510	.05	.87	250	78	65	1.0	250	118	45
3	4:33	781.650	.05	.87	250	79	65	1.0	250	118	45
4	4:35	782.79	.05	.87	250	81	66	1.0	250	118	45
5	4:37	783.93	.05	.87	250	84	66	1.0	250	118	45
6	4:39	785.06	.05	.87	250	84	66	1.0	250	118	45
7	4:41	786.19	.05	.87	250	86	66	1.0	250	118	45
8	4:43	787.32	.05	.87	250	87	67	1.0	250	118	45
9	4:45	788.45	.05	.87	250	88	67	1.0	250	118	45
10	4:47	789.58	.05	.87	250	89	67	1.0	250	118	46
11	4:49	790.72	.05	.87	250	90	68	1.0	250	118	46
12	4:51	791.85	.06	1.05	250	91	68	1.0	250	118	46
13	4:53	793.07	.06	1.05	250	92	69	1.0	250	118	46
14	4:55	794.29	.06	1.05	250	93	69	1.0	250	118	46
15	4:57	795.49	.06	1.05	250	93	69	1.0	250	118	47
16	4:59	796.71	.05	.87	250	93	70	1.0	250	118	47
17	5:01	797.83	.05	.87	250	93	70	1.0	250	118	47
18	5:03	798.94	.04	.72	250	92	70	1.0	250	118	47
19	5:05	799.96	.05	.87	250	92	71	1.0	250	118	48
20	5:07	801.08	.05	.87	250	92	71	1.0	250	118	48
21	5:09	802.21	.05	.87	250	92	71	1.0	250	118	49
22	5:11	803.33	.04	.72	250	93	71	1.0	250	118	44
23	5:13	804.36	.04	.72	250	93	72	1.0	250	118	49
24	5:15	805.15	.02	.37	250	93	72	1.0	250	118	49
		805.30									

Sample Time = ____ — Net Volume: ____ — Avg. $\sqrt{\Delta P}$ — Avg. ΔH — Avg. Meter Temp. °F — Avg. Stack Temp. °F

* Purge where required

*NA - Not Applicable

YC DRYER

IMPINGER CATCH

Sample No. Sample #2

Impinger No.	Solution Used	Amount of Solution (ml)	Imp. Tip Configuration	Weight (grams)
1	DI H2O			Final 239 Initial 100 Wt. gain 139
2	DI H2O			Final 128 Initial 100 Wt. gain 28
3	BLANK			Final 7 Initial 0 Wt. gain 7
4 1-3	Silica Gel			Final 751.4 Initial 736.0 Wt. gain 15.4
5				Final Initial Wt. gain
6				Final Initial Wt. gain
Flask				Final Initial Wt. gain

TOTAL WEIGHT GAIN OF IMPINGERS (grams) 189.4

Date _____

Signature _____

ORSAT ANALYSIS RESULTS

Gas Fractional Part

CO_2 _____

O_2 _____

CO _____

N_2 _____

Date _____

Time _____

Signature _____

STACK SAMPLING FIELD DATA

Plant Name _____ Stack Name YC Dryer Stack

Date 2-4-86 Oper. T.D.S. Sample # 2 Stack Height _____

Stack dia. (exit) ___ Stack dia. (port) ___ Stack Press. " H_2O .03 Bar. Press. " Hg 29.57

Probe # _____ PTCF .86 DGMCF 0.99 Nozzle # 3/8

Nozzle area 0.000767 Filter # _____ Int. wt. gms. 0.6700 Orifice Constants a NA b NA

Meter # RAC K factor NA* Pump # NA

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
B1	5:20	805.905	.06	1.05	250	89	71	1.0	250	118	48
2	5:22	807.16	.05	.87	250	92	72	1.0	250	118	48
3	5:24	808.32	.06	1.05	250	93	72	1.0	250	118	48
4	5:26	809.57	.06	1.05	250	94	73	1.0	250	118	48
5	5:28	810.83	.06	1.05	250	95	73	1.0	250	118	48
6	5:30	812.06	.07	1.30	250	95	73	1.0	250	118	48
7	5:32	813.45	.07	1.30	250	97	74	1.0	250	118	48
8	5:34	814.85	.07	1.30	250	97	74	1.0	250	118	49
9	5:36	816.25	.07	1.30	250	96	74	1.0	250	118	49
10	5:38	817.65	.07	1.30	250	96	74	1.0	250	118	49
11	5:40	819.05	.07	1.30	250	96	75	1.0	250	118	49
12	5:42	820.45	.06	1.05	250	96	75	1.0	250	118	49
13	5:44	821.67	.06	1.05	250	96	75	1.0	250	118	50
14	5:46	822.84	.06	1.05	250	96	75	1.0	250	118	50
15	5:48	824.11	.06	1.05	250	96	75	1.0	250	118	50
16	5:50	825.33	.06	1.05	250	96	75	1.0	250	118	51
17	5:52	826.53	.06	1.05	250	96	75	1.0	250	118	51
18	5:54	827.75	.06	1.05	250	96	76	1.0	250	118	51
19	5:56	828.97	.06	1.05	250	96	76	1.0	250	118	51
20	5:58	830.19	.06	1.05	250	96	76	1.0	250	118	52
21	6:00	831.42	.04	.72	250	96	76	1.0	250	118	52
22	6:02	832.45	.04	.72	250	96	76	1.0	250	118	52
23	6:04	833.48	.04	.72	250	96	76	1.0	250	118	53
24	6:06	834.51	.02	.37	250	96	76	1.0	250	118	53
	6:08	835.282	.230	0.95			81.6			118	

Sample Time: 96 Net Volume: 55.678

Avg. $\sqrt{\Delta P}$ | Avg. ΔH | Avg. Meter Temp. °F | Avg. Stack Temp. °F

Leak check .005 cfm

* Purge where required

*NA - Not Applicable

IMPINGER CATCH

Sample No. _____

Impinger No.	Solution Used	Amount of Solution (ml)	Imp. Tip Configuration	Weight (grams)
1	_____	_____	_____	Final _____ Initial _____ Wt. gain _____
2	_____	_____	_____	Final _____ Initial _____ Wt. gain _____
3	_____	_____	_____	Final _____ Initial _____ Wt. gain _____
4	_____	_____	_____	Final _____ Initial _____ Wt. gain _____
5	_____	_____	_____	Final _____ Initial _____ Wt. gain _____
6	_____	_____	_____	Final _____ Initial _____ Wt. gain _____
Flask	_____		_____	Final _____ Initial _____ Wt. gain _____

TOTAL WEIGHT GAIN OF IMPINGERS (grams) _____

Date _____

Signature _____

ORSAT ANALYSIS RESULTS

Gas Fractional Part

CO_2 _____

O_2 _____

CO _____

N_2 _____

Date _____

Time _____

Signature _____

STACK SAMPLING FIELD DATA

Plant Name Union-Carbide Stack Name 4C DRYER

Date 3-5-80 Oper. T.D.S. Sample # 3 Stack Height ____

Stack dia. (exit) 4x3 Stack dia. (port) ____ Stack Press. " H_2O ____ Bar. Press. " Hg ____

Probe # ____ PTCF 0.86 DGMCF 0.99 Nozzle # 3/8

Nozzle area 0.00067 Filter # ____ Int. wt. gms. 0.6673 Orifice Constants a NA, b NA

Meter # ____ K factor NA* Pump # NA

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
B1	9:00	843.648	.07	1.10	250	40	34	1.0	250	106	43
2	9:02	844.94	.07	1.10	250	41	35	1.0	250	106	42
3	9:04	846.16	.09	1.60	250	50	36	1.0	250	106	42
4	9:06	847.51	.09	1.60	250	52	36	1.0	250	106	42
5	9:08	848.715	1.0	1.9	250	54	36	1.0	250	106	42
6	9:10	850.53	1.0	1.9	250	63	38	1.0	250	106	42
7	9:12	852.08	.09	1.6	250	65	39	1.0	250	106	42
8	9:14	853.54	.09	1.6	250	67	40	1.0	250	106	45
9	9:16	854.99	.09	1.6	250	71	41	1.0	250	106	45
10	9:18	856.44	.09	1.6	250	71	41	1.0	250	106	45
11	9:20	857.88	.09	1.6	250	72	42	1.0	250	106	45
12	9:22	859.33	.09	1.6	250	74	44	1.0	250	106	45
13	9:24	860.78	1.0	1.9	250	76	45	1.0	250	106	45
14	9:26	862.34	1.0	1.45	250	78	47	1.0	250	106	46
15	9:28	863.71	.08	1.2	250	79	48	1.0	250	106	46
16	9:30	865.11	.09	1.4	250	80	49	1.0	250	106	46
17	9:32	866.51	.09	1.4	250	82	51	1.0	260	106	46
18	9:34	867.89	.08	1.2	250	82	51	1.0	250	106	46
19	9:36	869.19	.07	1.10	250	83	52	1.0	250	106	47
20	9:38	870.45	.07	1.10	250	83	53	1.0	250	106	48
21	9:40	871.71	.07	1.10	250	84	54	1.0	250	106	48
22	9:42	872.95	.05	.74	250	84	55	1.0	250	106	48
23	9:44	873.97	.05	.74	250	83	55	1.0	250	106	48
24	9:46	874.94	.02	.39	250	83	56	1.0	250	106	49
		875.179	.316							106	

* Purge where required

Sample Time = ____ Net Volume: ____ Avg. $\sqrt{\Delta P}$ Avg. ΔH Avg. Meter Temp. °F Avg. Stack Temp. °F

*NA - Not Applicable

IMPINGER CATCH

Sample No. YC DRYER #3

Impinger No.	Solution Used	Amount of Solution (ml)	Imp. Tip Configuration	Weight (grams)	
1	DI	100		Final	239
				Initial	100
				Wt. gain	
2	DI	100		Final	133
				Initial	100
				Wt. gain	
3	Blank			Final	4
				Initial	0
				Wt. gain	
4	Silica Gel			Final	253.5
				Initial	737.7
				Wt. gain	
5				Final	
				Initial	
				Wt. gain	
6				Final	
				Initial	
				Wt. gain	
Flask				Final	
				Initial	
				Wt. gain	

TOTAL WEIGHT GAIN OF IMPINGERS (grams) 191.8

Date _____

Signature _____

ORSAT ANALYSIS RESULTS

Gas Fractional Part

CO_2 _____

O_2 _____

CO _____

N_2 _____

Date _____

Time _____

Signature _____

STACK SAMPLING FIELD DATA

Plant Name Union-Carbide Stack Name 4C DRYER STACK

Date 3-5-80 Oper. J.O.S. Sample # 3 Stack Height ____

Stack dia. (exit) 18 Stack dia. (port) ____ Stack Press. " H_2O .04 Bar. Press. " Hg 24.64

Probe # ____ PTCF 0.88 DGMCF 0.99 Nozzle # ____

Nozzle area 0.000767 Filter # ____ Int. wt. gms. ____ Orifice Constants a NA b NA

Meter # RAC K factor NA* Pump # NA

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
A1	9:53	875.751	.07	1.10	250	78	58	1.0	250	106	54
2	9:55	877.03	.07	1.10	250	79	59	1.0	250	106	53
3	9:57	878.29	.07	1.05	250	80	59	1.0	250	106	53
4	9:59	879.53	.06	.85	250	82	59	1.0	250	106	53
5	10:01	880.66	.06	.85	250	83	60	1.0	250	106	53
6	10:03	881.79	.05	.74	250	84	60	1.0	250	106	55
7	10:05	882.82	.05	.74	250	84	60	1.0	250	106	52
8	10:07	883.87	.06	.85	250	85	61	1.0	250	106	51
9	10:09	885.00	.06	.85	250	85	61	1.0	250	106	51
10	10:11	886.09	.06	.85	250	87	62	1.0	250	106	50
11	10:13	887.22	.06	.85	250	87	63	1.0	250	106	50
12	10:15	888.33	.06	.85	250	88	63	1.0	250	106	50
13	10:17	889.45	.06	.85	250	88	63	1.0	250	106	50
14	10:19	890.57	.06	.85	250	89	64	1.0	250	106	49
15	10:21	891.69	.06	.85	250	89	65	1.0	250	106	49
16	10:23	892.81	.06	.85	250	91	65	1.0	250	106	49
17	10:25	893.92	.06	.85	250	91	66	1.0	250	106	49
18	10:27	895.04	.06	.85	250	91	66	1.0	250	106	48
19	10:29	896.16	.05	.74	250	91	67	1.0	250	106	48
20	10:31	897.20	.05	.74	250	91	67	1.0	250	106	49
21	10:33	898.24	.05	.74	250	91	68	1.0	250	106	49
22	10:35	899.27	.05	.74	250	90	68	1.0	250	106	50
23	10:37	900.31	.05	.74	250	92	69	1.0	250	106	50
24	10:39	901.35	.02	.39	250	92	70	1.0	250	106	51
* Purge where required	10:41	902.135	.316	1.08		66.6				106	

Sample Time = 90

Net Volume: 56.487

Avg. $\sqrt{\Delta P}$ | Avg. ΔH | Avg. Meter Temp. °F | Avg. Stack Temp. °F

*NA - Not Applicable

IMPINGER CATCH

Sample No. _____

Impinger No.	Solution Used	Amount of Solution (ml)	Imp. Tip Configuration	Weight (grams)
1	_____	_____	_____	Final _____ Initial _____ Wt. gain _____
2	_____	_____	_____	Final _____ Initial _____ Wt. gain _____
3	_____	_____	_____	Final _____ Initial _____ Wt. gain _____
4	_____	_____	_____	Final _____ Initial _____ Wt. gain _____
5	_____	_____	_____	Final _____ Initial _____ Wt. gain _____
6	_____	_____	_____	Final _____ Initial _____ Wt. gain _____
Flask	_____		_____	Final _____ Initial _____ Wt. gain _____

TOTAL WEIGHT GAIN OF IMPINGERS (grams) _____

Date _____

Signature _____

ORSAT ANALYSIS RESULTS

Gas Fractional Part

CO_2 _____

O_2 _____

CO _____

N_2 _____

Date _____

Time _____

Signature _____

STACK SAMPLING FIELD DATA

Plant Name _____ Stack Name YC Dryer STACK

Date 3-4-80 Oper. SDS Sample # 1 Stack Height _____

Stack dia. (exit) ___ Stack dia. (port) ___ Stack Press. " H_2O ___ Bar. Press. " Hg ___

Probe # _____ PTCF _____ DGMCF _____ Nozzle # 3/8

Nozzle area .000767 Filter # SGT 8 Int. wt. gms. _____ Orifice Constants a NA b NA

Meter # RAC K factor NA* Pump # NA

Impactor

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
1	6:20	837.376	.105	.87		82	73	1.0		118	
	6:24	839.610	"	.84		82	73	1.0		118	
	6:27	843.162		.87		82	73	1.0		118	
		5.786									
		0.82 cfm									

* Purge where required

Sample Time = _____ Net Volume = _____ Avg. √ΔP | Avg. ΔH | Avg. Meter Temp. °F | Avg. Stack Temp. °F

*NA - Not Applicable

Yc Dryer

IMPINGER CATCH

Sample No. Impactor Test #1

Impinger No.	Solution Used	Amount of Solution (ml)	Imp. Tip Configuration	Weight (grams)
1				Final Initial Wt. gain
2				Final Initial Wt. gain
3				Final 116 Initial 100 Wt. gain 16
4				Final 697.5 Initial 693.4 Wt. gain
5				Final Initial Wt. gain
6				Final Initial Wt. gain
Flask				Final Initial Wt. gain

TOTAL WEIGHT GAIN OF IMPINGERS (grams) _____

Date _____

Signature _____

ORSAT ANALYSIS RESULTS

Gas Fractional Part

CO_2 _____

O_2 _____

CO _____

N_2 _____

Date _____

Time _____

Signature _____

STACK SAMPLING FIELD DATA

Plant Name Union - Carbide Stack Name YC DRYER (Impactor)

Date 3/5/80 Oper. JDS Sample # 2 Stack Height

Stack dia. (exit) Stack dia. (port) Stack Press. " H_2O Bar. Press. " Hg

Probe # PTCF 0.86 DGMCF 0.99 Nozzle # 3/3

Nozzle area Filter # #7 Set Int. wt. gms. Orifice Constants a NA, b NA

Meter # RAC K factor NA* Pump # NA

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
1	10:51	907.400	.09	0.65		80	70	1.0		106	
	10:53			0.60		80	70	1.0		106	
	10:54			0.58		80	70	1.0		106	
	10:55			0.54		80	70	1.0		106	
	10:56			0.51		80	70	1.0		106	
	10:57			0.49		80	70	1.0		106	
	10:58			0.47		80	70	1.0		106	
	11:00			0.46		80	70	1.0		106	
		909.029									
		4.629									
		.5cfm									

* Purge where required

Sample Time = ____ Net Volume = ____ Avg. √ΔP Avg. ΔH Avg. Meter Temp. °F Avg. Stack Temp. °F

*NA - Not Applicable

IMPINGER CATCH

YC Dryer

Sample No. Impactor #2

Impinger No.	Solution Used	Amount of Solution (ml)	Imp. Tip Configuration	Weight (grams)
1	DI H_2O	100 ml		Final ____ Initial 100 Wt. gain ____
2	Silica Gel			Final ____ Initial 695.5 Wt. gain ____
3				Final ____ Initial ____ Wt. gain ____
4				Final ____ Initial ____ Wt. gain ____
5				Final ____ Initial ____ Wt. gain ____
6				Final ____ Initial ____ Wt. gain ____
Flask				Final ____ Initial ____ Wt. gain ____

TOTAL WEIGHT GAIN OF IMPINGERS (grams) _____

Date _____

Signature _____

ORSAT ANALYSIS RESULTS

Gas Fractional Part

CO_2 _____

O_2 _____

CO _____

N_2 _____

Date _____

Time _____

Signature _____

STACK SAMPLING FIELD DATA

Plant Name ~~Stack #2~~ Aerifall Stack Name Stack # 1

Date 3-5-80 Oper. _____ Sample # 1 Stack Height _____

Stack dia. (exit) ___ Stack dia. (port) ___ Stack Press. " H_2O .91 Bar. Press. " Hg 24.64

Probe # _____ PTCF _____ DGMCF .996 Nozzle # _____

Nozzle area .00018 Filter # 205 Int. wt. gms. _____ Orifice Constants a NA, b NA

Meter # _____ K factor NA* 0.292 Pump # NA

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
B-1	11:50	2432.20	0.79	0.23		50	52	1.0	230	135	51
2	53	2433.41	0.80	0.23		51	52	1.0	225	135	50
3	56	2434.62	0.81	0.24		50	53	1.0	258	135	50
4	59	2435.90	1.25	0.37		53	54	3.0	235	135	51
5	12:02	2437.18	1.45	0.42		55	57	3.0	228	135	50
6	05	2439.00	1.45	0.42		56	59	2.5	250	135	52
7	08	2440.82	1.45	0.42		58	60	2.5	258	135	52
8	11	2442.47	0.81	0.23		60	62	1.0	265	135	52
9	14	2444.00	0.68	0.20		60	64	1.0	252	135	52
10	17	2445.13	0.68	0.20		63	67	1.0	262	135	52
	12:20	2446.35									
A-1	12:33	2446.35	0.71	0.21		56	58	1.0	228	120	52
2	36	2447.58	1.15	0.34		56	59	1.0	230	125	51
3	39	2449.08	1.50	0.44		58	61	2.5	239	125	51
4	42	2450.64	1.45	0.42		60	63	2.5	249	125	51
5	45	2452.34	1.40	0.40		62	65	2.0	252	125	51
6	48	2454.89	1.15	0.34		63	65	2.0	238	125	51
7	51	2455.35	1.10	0.32		65	66	2.0	225	125	51
8	54	2456.84	1.10	0.32		68	71	2.0	232	125	51
9	57	2458.35	0.98	0.29		70	72	1.5	236	125	51
10	1:00	2459.70	0.76	0.22		71	75	1.0	235	125	51
	1:03	2461.08									
				leak ck	0.02	cfm @	18"				
		28.88	1.026	0.31		60.5				130	

Sample Time = 60 / Net Volume: ___ Avg. √ΔP Avg. ΔH Avg. Meter Temp. °F Avg. Stack Temp. °F

520.5

* Purge where required

*NA - Not Applicable

Prel. Temp = 133°F

ΔP: 1.40, 1.35, 1.50, 1.25, 1.10, 1.15

140, 142, 142

ΔP: 1.15, 1.25, 1.25, 1.15, 1.20

ΔP = 1.1

T_s = 601

Stack #1 IMPINGER CATCH Aerofall #1

Sample No. #1

Impinger No.	Solution Used	Amount of Solution (ml)	Imp. Tip Configuration	Weight (grams)
1	DI H_2O			Final 173 Initial 100 Wt. gain 73
2	DI H_2O			Final 85 Initial 100 Wt. gain -15
3	BLANK			Final 1 Initial 0 Wt. gain 1
4	SILICA GEL			Final 719.4 Initial 710.1 Wt. gain 9.3
5				Final Initial Wt. gain
6				Final Initial Wt. gain
Flask				Final Initial Wt. gain

TOTAL WEIGHT GAIN OF IMPINGERS (grams) 68.3

Date _____

Signature _____

ORSAT ANALYSIS RESULTS

Gas Fractional Part

CO_2 _____

O_2 _____

CO _____

N_2 _____

Date _____

Time _____

Signature _____ NUS CORPORATION

STACK SAMPLING FIELD DATA

Plant Name _____ Stack Name #1 AEROFALL

Date 3-5-80 Oper. PSG Sample # 2 Stack Height _____

Stack dia. (exit) ___ Stack dia. (port) ___ Stack Press. " H_2O .91 Bar. Press. " Hg 24.64

Probe # _____ PTCF .846 DGMCF 0.9956 Nozzle # _____

Nozzle area 0.00018 Filter # 218 Int. wt. gms. _____ Orifice Constants a NA b NA

Meter # Joy K factor NA* .992 Pump # NA

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
1	5:15	2469.09	0.96	0.28		47	48	1.5	230	131	47
2	18	2463.65	1.35	0.39		45	48	2.0	242	131	47
3	21	2465.31	1.45	0.42		48	49	2.0	225	131	47
4	24	2466.71	1.45	0.42		50	52	2.0	230	131	47
5	27	2468.38	1.35	0.39		50	53	2.0	241	131	47
6	30	2470.04	1.15	0.32		51	55	1.5	259	131	47
7	33	2471.44	1.00	0.32		52	56	1.5	260	131	47
8	36	2472.96	1.05	0.31		54	58	1.5	263	131	47
9	39	2474.41	0.83	0.24		55	60	1.5	265	131	47
10	42	2475.82	0.78	0.23		55	60	1.0	260	131	47
	45	2477.10									
1	49	2477.30	1.00	0.29		44	47	1.0	268	130	47
2	50	2478.45	1.05	0.31		50	52	1.0	260	130	47
3	53	2479.84	1.20	0.35		53	55	1.5	258	130	47
4	56	2481.35	1.25	0.37		56	58	2.0	257	130	47
5	59	2482.91	1.30	0.38		59	62	2.0	255	130	47
6	5:02	2484.50	1.25	0.37		60	64	2.0	250	130	47
7	05	2486.07	1.25	0.37		63	67	2.0	248	130	47
8	08	2487.57	1.15	0.34		65	68	2.0	245	130	47
9	11	2489.13	0.81	0.24		70	72	2.0	238	130	47
10	14	2490.46	0.68	0.20		71	76	2.0	267	130	47
	17	2491.76									
					Leak Ck	0.01 CFM @ 9"					
* Purge where required			1.052	0.33		56.5				130.5	
Sample Time: 60 Net Volume: 31.17			Avg. $\sqrt{\Delta P}$	Avg. ΔH		Avg. Meter Temp. °F				Avg. Stack Temp. °F	

*NA - Not Applicable

516.5

590.5

IMPINGER CATCH

Sample No. _____

Impinger No.	Solution Used	Amount of Solution (ml)	Imp. Tip Configuration	Weight (grams)
1				Final 146 Initial 100 Wt. gain 46
2				Final 120 Initial 100 Wt. gain 20
3				Final 3 Initial 0 Wt. gain 3
4				Final 726.4 Initial 719.4 Wt. gain 7
5				Final Initial Wt. gain
6				Final Initial Wt. gain
Flask				Final Initial Wt. gain

TOTAL WEIGHT GAIN OF IMPINGERS (grams) 76

Date _____

Signature _____

ORSAT ANALYSIS RESULTS

Gas Fractional Part

CO_2 _____

O_2 _____

CO _____

N_2 _____

Date _____

Time _____

Signature _____

STACK SAMPLING FIELD DATA

Plant Name _____ Stack Name STACK # 1 Aerofall

Date 7-6-80 Oper. _____ Sample #. 3 Stack Height _____

Stack dia. (exit) ___ Stack dia. (port) ___ Stack Press. " H_2O ___ Bar. Press. " Hg ___

Probe # _____ PTCF _____ DGMCF _____ Nozzle # _____

Nozzle area _____ Filter # 3007 Int. wt. gms. _____ Orifice Constants a NA b NA

Meter # Toy K factor NA*.375 Pump # NA

2629.05

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
A-1	5:03	2629.55	1.35	0.51		45	50	5.0	268	130	43
2	06	2631.35	1.75	0.51		47	51	5.0	244	130	43
3	9	2633.24	1.35	0.51		49	52	5.0	261	130	43
4	12	2635.05	1.30	0.49		51	54	5.0	268	130	43
5	15	2636.82	1.15	0.43		53	57	4.5	255	130	43
6	18	2638.53	1.05	0.39		52	58	4.0	238	130	43
7	21	2640.18	0.88	0.37		53	58	4.0	208	130	43
8	24	2641.70	0.92	0.35		54	60	3.5	262	130	45
9	27	2643.29	0.76	0.29		56	62	3.0	260	130	43
10	30	2644.64	0.66	0.25		59	65	2.5	250	130	43
	33	2646.00									
B-1	37	2648.00	1.05	0.39		52	56	4.0	233	130	43
2	40	2647.58	1.00	0.38		55	60	4.0	235	130	43
3	43	2649.19	1.10	0.41		57	61	4.5	249	130	43
4	46	2650.79	1.20	0.45		60	63	5.0	260	130	43
5	49	2652.46	1.20	0.45		62	64	5.0	268	130	43
6	52	2654.25	1.15	0.43		63	64	5.0	252	130	43
7	55	2655.90	1.20	0.45		64	66	5.0	255	130	43
8	58	2657.69	0.98	0.37		65	66	4.0	250	130	43
9	6:01	2659.20	0.78	0.29		67	70	3.5	236	130	43
10	04	2660.63	0.72	0.27		67	71	3.5	242	130	43
	07	2662.00									
				Leak ck @ 7"				0.015 CFM			
			1.020	0.40		58				130	
Sample Time: 60			Avg. $\sqrt{\Delta P}$	Avg. ΔH		Avg. Meter Temp. °F				Avg. Stack Temp. °F	
Net Volume: 32.45											

* Purge where required

*NA - Not Applicable

IMPINGER CATCH

Sample No. _____

Impinger No.	Solution Used	Amount of Solution (ml)	Imp. Tip Configuration	Weight (grams)
1				Final 161 Initial 100 Wt. gain 61
2				Final 122 Initial 100 Wt. gain 22
3				Final 2 Initial 0 Wt. gain 2
4				Final 747.2 Initial 738.3 Wt. gain 8.9
5				Final Initial Wt. gain
6				Final Initial Wt. gain
Flask				Final Initial Wt. gain

TOTAL WEIGHT GAIN OF IMPINGERS (grams) 93.9

Date _____

Signature _____

ORSAT ANALYSIS RESULTS

Gas Fractional Part

CO_2 _____

O_2 _____

CO _____

N_2 _____

Date _____

Time _____

Signature _____

STACK SAMPLING FIELD DATA

Plant Name _____ Stack Name Aerofall #1

Date 2-7-90 Oper. JRS Sample # 1 Stack Height _____

Stack dia. (exit) ___ Stack dia. (port) ___ Stack Press. " H_2O 6.91 Bar. Press. " Hg 24.56

Probe # _____ PTCF 0.86 DGMCF 0.99 Nozzle # V8

Nozzle area _____ Filter # Set 12 Int. wt. gms. _____ Orifice Constants a NA b NA

Meter # Rac K factor NA* Pump # NA

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
1	9:50	240.213	1.1	.67		45	43	1.0		131	39
	9:54		1.1	.57		44	43	1.0		131	40
	9:55		1.1	.58		44	43	1.0		131	40
	10:00		1.1	.58		53	43	1.0			
		245.261									

* Purge where required

Sample Time = _____ Net Volume = _____ Avg. $\sqrt{\Delta P}$ _____ Avg. ΔH _____ Avg. Meter Temp. °F _____ Avg. Stack Temp. °F _____

*NA - Not Applicable

IMPINGER CATCH

Sample No. 1

Impinger No.	Solution Used	Amount of Solution (ml)	Imp. Tip Configuration	Weight (grams)
1				Final Initial Wt. gain
2				Final Initial Wt. gain
3				Final 17 Initial Wt. gain
4 BAC				Final 740.6 Initial Wt. gain
5				Final Initial Wt. gain
6				Final Initial Wt. gain
Flask				Final Initial Wt. gain

TOTAL WEIGHT GAIN OF IMPINGERS (grams) _____

Date _____

Signature _____

ORSAT ANALYSIS RESULTS

Gas Fractional Part

CO_2 _____

O_2 _____

CO _____

N_2 _____

Date _____

Time _____

Signature _____ NUS CORPORATION

STACK SAMPLING FIELD DATA

Plant Name _____ Stack Name #1 Aerofall

Date 2-7-80 Oper. J.O.S. Sample # 2 Stack Height _____

Stack dia. (exit) ___ Stack dia. (port) ___ Stack Press. " H_2O .94 Bar. Press. " Hg 24.56

Probe # _____ PTCF .86 DGMCF .99 Nozzle # 1/8

Nozzle area _____ Filter # Set 11 Int. wt. gms. _____ Orifice Constants a NA b NA

Meter # KAC K factor NA* Pump # NA

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
Traverse	1	10:33	245.407	1.1	.42		43	41	1.0		131	38
		10:38		1.1	.39		45	42	1.0		131	38
		10:43		1.1	.34		47	41	1.0		131	38
		*	249.508									

* Purge where required

Sample Time = _____ Net Volume = _____ Avg. $\sqrt{\Delta P}$ Avg. ΔH Avg. Meter Temp. °F Avg. Stack Temp. °F

*NA - Not Applicable

IMPINGER CATCH

Sample No. _____

Impinger No.	Solution Used	Amount of Solution (ml)	Imp. Tip Configuration	Weight (grams)
1				Final _____ Initial _____ Wt. gain _____
2				Final _____ Initial _____ Wt. gain _____
3				Final 103 Initial 100 Wt. gain 3
RAC				Final 2006 Initial _____ Wt. gain _____
5				Final _____ Initial _____ Wt. gain _____
6				Final _____ Initial _____ Wt. gain _____
Flask				Final _____ Initial _____ Wt. gain _____

TOTAL WEIGHT GAIN OF IMPINGERS (grams) _____

Date _____

Signature _____

ORSAT ANALYSIS RESULTS

Gas Fractional Part

CO_2 _____

O_2 _____

CO _____

N_2 _____

Date _____

Time _____

Signature _____ NUS CORPORATION

RAC

STACK SAMPLING FIELD DATA

Plant Name _____ Stack Name #2 Acme Fall

Date 3-6-80 Oper. T.D.S. Sample # 1 Stack Height _____

Stack dia. (exit) ___ Stack dia. (port) ___ Stack Press. " H_2O 0.81 Bar. Press. " Hg 24.56

Probe # _____ PTCF 0.86 DGMCF 0.99 Nozzle # _____

Nozzle area 0.000896 Filter # 0.6652 Int. wt. gms. _____ Orifice Constants a NA b NA

Meter # RAC K factor NA* Pump # NA

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
A1	8:04	61.810	1.1	1.2	250	56	48	1.0	250	128	43
2	8:12	63.840	1.1	1.2	250	60	49	1.0	250	128	43
3	8:15	65.860	1.1	1.2	250	64	49	1.0	250	128	43
4	8:18	67.890	1.1	1.2	250	66	50	1.0	250	128	43
5	8:21	69.910	1.1	1.2	250	70	51	1.0	250	128	43
6	8:24	71.950	1.3	1.2	250	72	52	1.0	250	128	43
7	8:27	73.99	1.3	1.2	250	74	54	1.0	250	128	43
8	8:30	76.02	1.3	1.2	250	75	54	1.0	250	128	43
9	8:33	78.05	1.4	1.2	250	76	55	1.0	250	128	43
10	8:36	80.08	1.3	1.2	250	76	56	1.0	250	128	43
B1	8:43	82.133	1.3	1.2	250	70	57	1.0	250	128	44
2	8:46	84.25	1.2	1.2	250	74	58	1.0	250	128	44
3	8:49	86.37	1.2	1.2	250	76	59	1.0	250	128	46
4	8:52	88.49	1.1	1.2	250	78	60	1.0	250	128	46
5	8:55	90.61	1.1	1.2	250	81	61	1.0	250	128	46
6	8:58	92.74	1.1	1.2	250	82	62	1.0	250	128	46
7	9:01	94.90	1.1	1.2	250	82	63	1.0	250	128	47
8	9:04	97.03	1.1	1.2	250	82	63	1.0	250	128	47
9	9:07	99.66	1.1	1.2	250	83	64	1.0	250	128	48
10	9:10	101.74	0.8	1.2	250	83	65	1.0	250	128	49
	9:13	104.137	1.075	1.20		65				128	

Sample Time: 60 Net Volume: 42.32

Avg. $\sqrt{\Delta P}$ | Avg. ΔH | Avg. Meter Temp. °F | Avg. Stack Temp. °F

A check 1006 cfm

* Purge where required

*NA - Not Applicable

IMPINGER CATCH

Sample No. _____

Impinger No.	Solution Used	Amount of Solution (ml)	Imp. Tip Configuration	Weight (grams)
1				Final 176 Initial 100 Wt. gain 76
2				Final 111 Initial 100 Wt. gain 11
3				Final Initial Wt. gain
4	Silica Gel		S	Final Initial 739.0 Wt. gain 743.5
5				Final 9.5 Initial Wt. gain
6				Final Initial Wt. gain
Flask				Final Initial Wt. gain

TOTAL WEIGHT GAIN OF IMPINGERS (grams) 96.5

Date _____

Signature _____

ORSAT ANALYSIS RESULTS

Gas Fractional Part

CO_2 _____

O_2 _____

CO _____

N_2 _____

Date _____

Time _____

Signature _____

STACK SAMPLING FIELD DATA RAC

Plant Name _____ Stack Name #2 Aerofall

Date 3-6-80 Oper. T.O.S. Sample # 2 Stack Height _____

Stack dia. (exit) ___ Stack dia. (port) ___ Stack Press. " H_2O 0.81 Bar. Press. " Hg ___

Probe # _____ PTCF .86 DGMCF _____ Nozzle # 3/16

Nozzle area .000192 Filter # 16729 Int. wt. gms. _____ Orifice Constants a NA b NA

Meter # _____ K factor NA* Pump # NA

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
A1	11:10	104.658	1.4	1.1	250	53	49	1.0	250	123	42
2	11:13	106.77	1.3	1.2	250	56	49	1.0	250	123	42
3	11:16	108.89	1.2	1.1	250	59	50	1.0	250	123	42
4	11:19	110.96	1.1	1.05	250	62	50	1.0	250	123	42
5	11:22	112.97	1.2	1.1	250	67	51	1.0	250	123	42
6	11:25	115.05	1.1	1.05	250	70	52	1.0	250	123	43
7	11:28	117.08	1.2	1.1	250	73	53	1.0	250	123	43
8	11:31	119.14	1.2	1.1	250	76	55	1.0	250	123	43
9	11:34	121.23	1.1	1.05	250	78	56	1.0	250	123	43
10	11:37	123.24	0.95	0.95	250	81	57	1.0	250	123	44
A1	11:47	125.137	1.2	1.1	250	72	58	1.0	250	123	46
2	11:50	127.39	1.2	1.1	250	76	60	1.0	250	123	46
3	11:53	129.28	1.1	1.05	250	76	60	1.0	250	123	46
4	11:56	131.26	1.1	1.05	250	78	61	1.0	250	123	47
5	11:59	133.23	1.2	1.1	250	82	62	1.0	250	123	47
6	12:02	135.26	1.3	1.1	250	84	63	1.0	250	123	48
7	12:05	137.31	1.3	1.1	250	84	63	1.0	250	123	48
8	12:08	139.34	1.4	1.1	250	82	63	1.0	250	123	48
9	12:11	141.39	1.4	1.1	250	82	64	1.0	250	123	49
10	12:14	143.42	1.2	1.1	250	82	64	1.0	250	123	49
	12:17	145.445	1.098	1.085		65				123	

Sample Time = 60 Net Volume: 38.76 Avg. $\sqrt{\Delta P}$ Avg. ΔH Avg. Meter Temp. °F Avg. Stack Temp. °F

*NA - Not Applicable

* Purge where required

A

ank

ell

,007 cfm

IMPINGER CATCH

Sample No. _____

Impinger No.	Solution Used	Amount of Solution (ml)	Imp. Tip Configuration	Weight (grams)
1				Final 175 Initial 100 Wt. gain 75
2				Final 114 Initial 100 Wt. gain 14
3				Final 5 Initial 0 Wt. gain 5
4	Silica Gel			Final 752.0 Initial 743.8 Wt. gain 8.2
5				Final _____ Initial _____ Wt. gain _____
6				Final _____ Initial _____ Wt. gain _____
Flask				Final _____ Initial _____ Wt. gain _____

TOTAL WEIGHT GAIN OF IMPINGERS (grams) 102.2

Date _____

Signature _____

ORSAT ANALYSIS RESULTS

Gas Fractional Part

CO_2 _____

O_2 _____

CO _____

N_2 _____

Date _____

Time _____

Signature _____ NUS CORPORATION

STACK SAMPLING FIELD DATA

Plant Name _____ Stack Name Akrofall. #2

Date 3-1-80 Oper. _____ Sample # 3 Stack Height _____

Stack dia. (exit) ___ Stack dia. (port) ___ Stack Press. " H_2O ___ Bar. Press. " Hg ___

Probe # _____ PTCF _____ DGMCF ³ _____ Nozzle # _____

Nozzle area 0.00018 Filter # 2010 Int. wt. gms. _____ Orifice Constants a NA b NA

Meter # Dry K factor NA* .384 Pump # NA

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
A-1	2.10	2595.92	0.92	0.35		47	50	2.0	238	123	49
2	13	2597.34	0.96	0.37		49	51	2.5	262	123	49
3	16	2598.92	0.96	0.37		49	53	2.5	270	123	49
4	19	2600.52	1.00	0.38		51	55	2.5	263	123	49
5	22	2602.16	1.10	0.41		52	56	3.0	269	123	49
6	25	2603.80	1.20	0.46		53	56	3.0	230	123	49
7	28	2605.51	1.25	0.47		55	57	3.5	239	123	49
8	31	2607.32	1.35	0.52		57	60	4.0	229	123	49
9	34	2609.15	1.30	0.50		61	63	4.0	243	123	49
10	37	2610.90	1.05	0.39		62	65	3.5	252	123	49
	40	2612.52									
B-1	3.46	2612.52	1.10	0.41		57	61	6.0	232	123	49
2	49	2614.04	1.20	0.46		60	63	6.0	240	123	49
3	52	2615.73	1.05	0.39		61	65	5.0	248	123	49
4	55	2617.40	1.00	0.38		62	67	5.0	252	123	49
5	58	2619.00	1.00	0.38		64	68	5.0	257	123	49
6	4.01	2620.54	1.00	0.38		66	69	5.0	247	123	49
7	04	2622.20	1.05	0.39		67	70	5.0	252	123	49
8	07	2623.79	1.10	0.41		67	70	5.0	247	123	49
9	10	2625.42	0.98	0.37		66	70	5.0	250	123	49
10	13	2627.04	1.00	0.38		67	72	5.0	250	123	49
	16	2628.58									
				Leak	ck	@ 9" Hg		<0.01 CFM			
			1.034	0.41		60				123	

Sample Time = 60 Net Volume: 32.86 Avg. $\sqrt{\Delta P}$ Avg. ΔH Avg. Meter Temp. °F Avg. Stack Temp. °F

* Purge where required

*NA - Not Applicable

IMPINGER CATCH

Sample No. _____

Impinger No.	Solution Used	Amount of Solution (ml)	Imp. Tip Configuration	Weight (grams)
1				Final 183 Initial 100 Wt. gain 83
2				Final 109 Initial 100 Wt. gain 9
3				Final 2 Initial 0 Wt. gain 2
4	Silica Gel			Final 768.5 Initial 763.0 Wt. gain 5.5
5				Final _____ Initial _____ Wt. gain _____
6				Final _____ Initial _____ Wt. gain _____
Flask				Final _____ Initial _____ Wt. gain _____

TOTAL WEIGHT GAIN OF IMPINGERS (grams) 99.5

Date _____

Signature _____

ORSAT ANALYSIS RESULTS

Gas Fractional Part

CO_2 _____

O_2 _____

CO _____

N_2 _____

Date _____

Time _____

Signature _____ NUS CORPORATION

STACK SAMPLING FIELD DATA

Plant Name _____ Stack Name #2 Acrofall

Date 3-6-80 Oper. T.D.S. Sample # 1 Stack Height _____

Stack dia. (exit) ___ Stack dia. (port) ___ Stack Press. " H_2O 0.51 Bar. Press. " Hg ___

Probe # _____ PTCF .86 DGMCF 0.99 Nozzle # 3/16

Nozzle area .000192 Filter # set 6 Int. wt. gms. _____ Orifice a NA

Meter # R+C K factor NA* Pump # NA Constants b NA

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
1	12:36	145,586	1.2	.68		64	61			123	51
	12:37		1.2	.67		66	63			123	51
	12:40		1.2	.66		68	64			123	47
	12:43		1.2	.66		70	64			123	47
	12:46	150,862									

* Purge here required

Sample Time = _____ Net Volume = _____ Avg. $\sqrt{\Delta P}$ Avg. ΔH Avg. Meter Temp. °F Avg. Stack Temp. °F

NA - Not Applicable

IMPINGER CATCH

Sample No. Impactor

Impinger No.	Solution Used	Amount of Solution (ml)	Imp. Tip Configuration	Weight (grams)
1				Final 105 Initial 100 Wt. gain 5
2				Final 699.6 Initial 699.2 Wt. gain 0.4
3				Final Initial Wt. gain
4				Final Initial Wt. gain
5				Final Initial Wt. gain
6				Final Initial Wt. gain
Flask				Final Initial Wt. gain

TOTAL WEIGHT GAIN OF IMPINGERS (grams) _____

Date _____

Signature _____

ORSAT ANALYSIS RESULTS

Gas Fractional Part

CO_2 _____

O_2 _____

CO _____

N_2 _____

Date _____

Time _____

Signature _____

STACK SAMPLING FIELD DATA

Plant Name _____ Stack Name #2 Aerofall

Date 3-7-80 Oper. J.B.S. Sample # 2 Stack Height _____

Stack dia. (exit) ___ Stack dia. (port) ___ Stack Press. " H_2O 0.51 Bar. Press. " Hg 27.56

Probe # _____ PTCF 0.86 DGMCF 0.99 Nozzle # 1/8

Nozzle area _____ Filter # Set # 14 Int. wt. gms. _____ Orifice Constants a NA b NA

Meter # R4C K factor NA* Pump # NA

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
1	9:16	235.133	1.1	.58		43	41	1.0		123	37
	9:17		1.1	.57		43	41	1.0		123	37
	9:21		1.1	.56		47	41	1.0		123	37
	9:24		1.1	.53		50	41	1.0		123	37
	9:26		1.1	.53		50	41	1.0		123	37
		239.864									

* Purge where required

Sample Time: _____ Net Volume: _____ Avg. $\sqrt{\Delta P}$ Avg. ΔH Avg. Meter Temp. °F Avg. Stack Temp. °F

*NA - Not Applicable

IMPINGER CATCH

Sample No. _____

Impinger No.	Solution Used	Amount of Solution (ml)	Imp. Tip Configuration	Weight (grams)
1				Final _____ Initial _____ Wt. gain _____
2				Final 107 Initial 100 Wt. gain 7
3				Final _____ Initial _____ Wt. gain _____
4 RAC				Final _____ Initial 693.2 Wt. gain _____
5				Final _____ Initial _____ Wt. gain _____
6				Final _____ Initial _____ Wt. gain _____
Flask				Final _____ Initial _____ Wt. gain _____

TOTAL WEIGHT GAIN OF IMPINGERS (grams) _____

Date _____

Signature _____

ORSAT ANALYSIS RESULTS

Gas	Fractional Part
CO_2	
O_2	
CO	
N_2	

Date _____

Time _____

Signature _____

STACK SAMPLING FIELD DATA

Plant Name _____ Stack Name Leach Stack

Date 3-7-80 Oper. _____ Sample # 1 Stack Height _____

Stack dia. (exit) _____ Stack dia. (port) 30" Stack Press. " H_2O 0.0 Bar. Press. " Hg 24.59

Probe # _____ PTCF 0.86 DGMCF 0.99 Nozzle # 2

Nozzle area .000767 Filter # ~~3006~~ 3009 Int. wt. gms. _____ Orifice a NA

Meter # RAC K factor NA* Pump # NA Constants b NA

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
A 1	2:20	249.651	.025	.37	250	45	43	1.0	250	130	39
2	2:25	251.68	.02	.27	250	51	44	1.0	250	130	34
3	2:30	253.45	.01	.10	250	54	44	1.0	250	130	38
4	2:35	254.64	.01	.10	250	55	44	1.0	250	130	38
5	2:40	555.77	.01	.10	250	46	58	1.0	250	130	38
6	2:45	256.90	.01	.10	250	60	47	1.0	250	130	38
B 1	2:54	258.072	.02	.27	250	60	49	1.0	250	130	39
2	2:59	259.76	.01	.10	250	64	51	1.0	250	130	39
3	3:04	260.97	.01	.10	250	65	52	1.0	250	130	39
4	3:09	262.11	.01	.10	250	66	54	1.0	250	130	39
5	3:14	263.20	.01	.10	250	66	55	1.0	250	130	39
6	3:19	264.34	.01	.10	250	67	55	1.0	250	130	39
	3:24	265.47	0.140	0.15		54				130	

Sample Time: 60 Net Volume: 1582 Avg. $\sqrt{\Delta P}$ Avg. ΔH Avg. Meter Temp. °F Avg. Stack Temp. °F

* Purge where required

*NA - Not Applicable

IMPINGER CATCH

Sample No. _____

Impinger No.	Solution Used	Amount of Solution (ml)	Imp. Tip Configuration	Weight (grams)
1				Final 156 Initial 100 Wt. gain 56
2				Final 105 Initial 100 Wt. gain 5
3				Final 1 Initial 0 Wt. gain 1
4				Final 813.0 Initial 810.1 Wt. gain 2.9
5				Final Initial Wt. gain
6				Final Initial Wt. gain
Flask				Final Initial Wt. gain

TOTAL WEIGHT GAIN OF IMPINGERS (grams) 64.9

Date _____

Signature _____

ORSAT ANALYSIS RESULTS

Gas Fractional Part

CO_2 _____

O_2 _____

CO _____

N_2 _____

Date _____

Time _____

Signature _____ NUS CORPORATION

STACK SAMPLING FIELD DATA

Plant Name _____ Stack Name Leach Stack

Date 3-7-80 Oper. T.B.S. Sample # 2 Stack Height _____

Stack dia. (exit) ___ Stack dia. (port) ___ Stack Press. " H_2O .00 Bar. Press. " Hg 24.59

Probe # _____ PTCF 0.86 DGMCF 0.99 Nozzle # ½"

Nozzle area .00136 Filter # 3014 Int. wt. gms. _____ Orifice Constants a NA b NA

Meter # RAC K factor NA* Pump # NA

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
A1	5:15	265.766	.02	0.55	250	49	44	1.0	250	130	40
2	5:23	268.63	.01	0.59	250	57	45	1.0	250	130	40
3	5:28	271.00	.02	0.55	250	65	46	1.0	250	130	40
4	5:33	273.83	.01	0.56	250	68	47	1.0	250	130	40
5	5:38	276.18	.01	0.50	250	71	49	1.0	250	130	40
6	5:43	278.30	.01	0.47	250	71	51	1.0	250	130	40
B1	5:52	280.340	.02	0.55	250	67	52	1.0	250	130	41
2	5:57	283.45	.01	0.44	250	69	53	1.0	250	130	41
3	6:02	285.59	.01	0.40	250	70	54	1.0	250	130	41
4	6:07	287.63	.01	0.40	250	71	55	1.0	250	130	42
5	6:12	289.69	.01	0.40	250	71	55	1.0	250	130	42
6	6:17	291.72	.01	0.40	250	71	55	1.0	250	130	42
	6:22	293.77	0.110	0.56		59				130	

Sample Time: ~~XX~~ Avg. $\sqrt{\Delta P}$ | Avg. ΔH | Avg: Meter Temp. °F | Avg. Stack Temp. °F

Net Volume: 28.01

* Purge where required

*NA - Not Applicable

IMPINGER CATCH

Sample No. _____

Impinger No.	Solution Used	Amount of Solution (ml)	Imp. Tip Configuration	Weight (grams)
1				Final 180 Initial 100 Wt. gain 80
2				Final 113 Initial 100 Wt. gain 13
3				Final Initial Wt. gain
4				Final 818.3 Initial 813.0 Wt. gain 5.3
5				Final Initial Wt. gain
6				Final Initial Wt. gain
Flask				Final Initial Wt. gain

TOTAL WEIGHT GAIN OF IMPINGERS (grams) 98.3

Date _____

Signature _____

ORSAT ANALYSIS RESULTS

Gas Fractional Part

CO_2 _____

O_2 _____

CO _____

N_2 _____

Date _____

Time _____

Signature _____ NUS CORPORATION

STACK SAMPLING FIELD DATA

Plant Name Union Carbide — Stack Name Leach Stack

Date 3-7-80 — Oper. T.O.S. — Sample # 3 — Stack Height ____

Stack dia. (exit) ____ — Stack dia. (port) ____ — Stack Press. " H_2O 21.0 — Bar. Press. " Hg 24.59

Probe # ____ — PTCF 0.86 — DGMCF 0.99 — Nozzle # Kn

Nozzle area 0.00136 — Filter # 3019 — Int. wt. gms. ____ — Orifice Constants: a NA, b NA

Meter # DAC — K factor NA* — Pump # NA

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
B1	8:12	293.80	0.02	.85	250	45	42	1.0	250	130	42
2	8:17	296.61	0.02	.85	250	50	42	1.0	250	130	42
3	8:22	299.41	0.02	.85	250	60	44	1.0	250	130	42
4	8:27	302.24	0.02	.85	250	63	45	1.0	250	130	42
5	8:32	305.08	0.01	.40	250	67	47	1.0	250	130	42
6	8:37	307.09	0.01	.40	250	68	48	1.0	250	130	42
									[illegible]		
A1	8:44	309.118	0.01	.40	250	67	51	1.0	250	130	42
2	8:49	311.12	0.01	.40	250	68	52	1.0	250	130	42
3	8:54	313.13	0.01	.40	250	71	53	1.0	250	130	42
4	8:59	315.15	0.01	.40	250	73	54	1.0	250	130	43
5	9:04	317.18	0.01	.40	250	73	55	1.0	250	130	43
6	9:09	319.20	0.01	.40	250	75	57	1.0	250	130	43
	9:14	321.253	0.114	0.55		65				130	
	Volume: 27.71		Avg. $\sqrt{\Delta P}$	Avg. ΔH		Avg. Meter Temp. °F				Avg. Stack Temp. °F	

- Not Applicable

IMPINGER CATCH

Sample No. _____

Impinger No.	Solution Used	Amount of Solution (ml)	Imp. Tip Configuration	Weight (grams)
1				Final 196 Initial 100 Wt. gain 96
2				Final 110 Initial 100 Wt. gain 10
3				Final 2 Initial 0 Wt. gain 2
4				Final 822.9 Initial 818.3 Wt. gain 4.6
5				Final Initial Wt. gain
6				Final Initial Wt. gain
Flask				Final Initial Wt. gain

TOTAL WEIGHT GAIN OF IMPINGERS (grams) 112.6

Date _____

Signature _____

ORSAT ANALYSIS RESULTS

Gas Fractional Part

CO_2 _____

O_2 _____

CO _____

N_2 _____

Date _____

Time _____

Signature _____ NUS CORPORATION

STACK SAMPLING FIELD DATA

Plant Name Union - Carbide Stack Name AK Leach Stack

Date 3-7-80 Oper. PSC Sample # 1 Stack Height ____

Stack dia. (exit) ____ Stack dia. (port) ____ Stack Press. " H_2O -0.92 Bar. Press. " Hg ____

Probe # ____ PTCF ____ DGMCF ____ Nozzle # ____

Nozzle area 0.00018 Filter # 3013 Int. wt. gms. ____ Orifice Constants: a NA, b NA

Meter # Dry K factor NA* 0.516 Pump # NA

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
A-1	7:04	2778.15	1.30	0.67		49	50	8.0	250	55	30
2	11	2784.96	1.25	0.65		50	50	7.0	250	55	30
3	18	2791.12	1.35	0.70		51	55	7.5	250	55	30
4	25	2797.32	1.20	0.62		52	55	7.0	250	55	30
	32	2803.28									
B-1	7:42	2803.28	1.25	0.65		52	55	7.0	250	55	30
2	49	2808.92	1.30	0.67		56	60	7.0	250	55	30
3	56	2815.70	1.20	0.62		62	62	6.0	250	55	30
4	8:03	2820.44	1.10	0.57		60	62	5.0	250	55	30
	10	2825.30									
				Leak check @ 9" Hg < 0.01 CFM							
Purge where required											
	56	47.15	1.115	0.64		55				55	
Sample Time:			Avg. $\sqrt{\Delta P}$	Avg. ΔH		Avg. Meter Temp. °F				Avg. Stack Temp. °F	
Net Volume:											

*NA - Not Applicable

IMPINGER CATCH

Sample No. 1

Impinger No.	Solution Used	Amount of Solution (ml)	Imp. Tip Configuration	Weight (grams)
1	DI H_2O			Final ____ Initial 100 Wt. gain ____
2	DI H_2O			Final ____ Initial 100 Wt. gain ____
3	BLANK			Final ____ Initial 0 Wt. gain ____
4	SILICA GEL			Final ____ Initial 738.3 Wt. gain ____
5				Final ____ Initial ____ Wt. gain ____
6				Final ____ Initial ____ Wt. gain ____
Flask				Final ____ Initial ____ Wt. gain ____

TOTAL WEIGHT GAIN OF IMPINGERS (grams) ____

Date ____

Signature ____

ORSAT ANALYSIS RESULTS

Gas Fractional Part

CO_2 ____

O_2 ____

CO ____

N_2 ____

Date ____

Time ____

Signature ____ NUS CORPORATION

STACK SAMPLING FIELD DATA

Plant Name Union - Carbide Stack Name AK Leach Stack

Date 3-7-80 Oper. PSC Sample # 2 Stack Height ____

Stack dia. (exit) ____ Stack dia. (port) ____ Stack Press. " H_2O -0.92 Bar. Press. " Hg ____

Probe # ____ PTCF ____ DGMCF ____ Nozzle # ____

Nozzle area .00018 Filter # 3012 Int. wt. gms. ____ Orifice Constants: a NA, b NA

Meter # Toy K factor NA*0.516 Pump # NA

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
B-1	9:02	2827.23	1.30	0.67		55	60	6.5	250	55	30
2	09	2832.50	1.35	0.70		62	63	7.0	250	55	30
3	16	2838.23	1.25	0.65		62	64	6.0	250	55	30
4	23	2843.70	1.00	0.52		64	66	5.0	250	55	30
	30	2848.64									
A-1	9:35	2848.64	1.25	0.65		65	67	6.5	250	55	30
2	42	2853.98	1.35	0.70		66	66	7.0	250	55	30
3	49	2859.62	1.35	0.70		66	68	7.0	250	55	30
4	56	2865.35	1.20	0.62		67	69	6.5	250	55	30
	10:03	2871.65									
				Leak	Check @	9" Hg		0.02 CFM			

* Purge where required

			1.120	0.65		64	55
Sample Time: 56			Avg. $\sqrt{\Delta P}$	Avg. ΔH		Avg. Meter Temp. °F	Avg. Stack Temp. °F
Net Volume: 44.42							

*NA - Not Applicable

IMPINGER CATCH

Sample No. 2

Impinger No.	Solution Used	Amount of Solution (ml)	Imp. Tip Configuration	Weight (grams)
1	DI H_2O			Final ____ Initial 100 Wt. gain ____
2	DI H_2O			Final ____ Initial 100 Wt. gain ____
3	BLANK			Final ____ Initial 0 Wt. gain ____
4	SILICA GEL			Final ____ Initial 725.5 Wt. gain ____
5				Final ____ Initial ____ Wt. gain ____
6				Final ____ Initial ____ Wt. gain ____
Flask				Final ____ Initial ____ Wt. gain ____

TOTAL WEIGHT GAIN OF IMPINGERS (grams) ____

Date 3-7-80

Signature ____

ORSAT ANALYSIS RESULTS

Gas Fractional Part

CO_2 ____

O_2 ____

CO ____

N_2 ____

Date ____

Time ____

Signature ____ NUS CORPORATIO

STACK SAMPLING FIELD DATA

Plant Name Union - Carbide Stack Name AK Leach Stack

Date 3-7-80 Oper. PSC Sample # 3 Stack Height ____

Stack dia. (exit) ____ Stack dia. (port) ____ Stack Press. " H_2O -.92 Bar. Press. " Hg ____

Probe # ____ PTCF ____ DGMCF ____ Nozzle # ____

Nozzle area 0.00018 Filter # 3017 Int. wt. gms. ____ Orifice Constants a NA, b NA

Meter # Ioy K factor NA*0.516 Pump # NA

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
A-1	10:47	2871.82	1.25	0.55		55	57	8.0	250	55	30
2	54	2877.00	1.35	0.55		55	57	8.0	250	55	30
3	11:01	2882.00	1.35	0.55		57	59	8.0	250	55	30
4	08	2887.02	1.00	0.55		57	59	8.0	250	55	30
	15	2892.11									
B-1	11:19	2892.11	1.25	0.55		56	58	8.0	250	55	30
2	26	2897.15	1.35	0.55		57	59	8.0	250	55	30
3	33	2902.21	1.30	0.55		58	59	8.0	250	55	30
4	40	2907.25	1.20	0.55		59	60	8.0	250	55	30
	47	2912.36									
				Leak check @ 9" Hg		< 0.02 CFM					
			1.120	0.55		58				55	
			Avg. $\sqrt{\Delta P}$	Avg. ΔH		Avg. Meter Temp. °F				Avg. Stack Temp. °F	

Sample Time = 56

Net Volume: 40.54

* Purge where required

*NA - Not Applicable

IMPINGER CATCH

Sample No. 3

Impinger No.	Solution Used	Amount of Solution (ml)	Imp. Tip Configuration	Weight (grams)
1	DI H_2O			Final ____ Initial 100 Wt. gain ____
2	DI H_2O			Final ____ Initial 100 Wt. gain ____
3	BLANK			Final ____ Initial 0 Wt. gain ____
4	SILICA GEL			Final ____ Initial 734.7 Wt. gain ____
5				Final ____ Initial ____ Wt. gain ____
6				Final ____ Initial ____ Wt. gain ____
Flask				Final ____ Initial ____ Wt. gain ____

TOTAL WEIGHT GAIN OF IMPINGERS (grams) ____

Date 3-7-80

Signature ____

ORSAT ANALYSIS RESULTS

Gas Fractional Part

CO_2 ____

O_2 ____

CO ____

N_2 ____

Date ____

Time ____

Signature ____ NUS CORPORATIO

Set "B"

STACK SAMPLING FIELD DATA

Plant Name Union Carbide Stack Name MC Leach

Date 3/7 Oper. _____ Sample # 1 Stack Height _____

Stack dia. (exit) ___ Stack dia. (port) ___ Stack Press. " H_2O ___ Bar. Press. " Hg ___

Probe # _____ PTCF _____ DGMCF _____ Nozzle # _____

Nozzle area _____ Filter # _____ Int. wt. gms. _____ Orifice Constants a NA b NA

Meter # _____ K factor NA* Pump # NA

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature		L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
						Inlet	Outlet				
	11:57	29128	1.0	0.18		55	57	8.0		55	30
	12:07	29168	1.0	0.18		55	57	8.0		55	30

* Purge where required

Sample Time = _____ Net Volume: _____ Avg. $\sqrt{\Delta P}$ | Avg. ΔH | Avg. Meter Temp. °F | Avg. Stack Temp. °F

STACK SAMPLING FIELD DATA

Plant Name Union Carbide — Stack Name Frit Ore Load

Date 3-7-80 — Oper. — Sample # 1 — Stack Height —

Stack dia. (exit) — Stack dia. (port) — Stack Press. " H_2O -0.64 — Bar. Press. " Hg —

Probe # — PTCF — DGMCF — Nozzle # —

Nozzle area — Filter # A 3016 — Int. wt. gms. — Orifice Constants: a NA, b NA

Meter # Joy — K factor NA* 0.50 — Pump # NA

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
A-1	9:54	2663.61	0.96	0.23		40	40	2.0	250	70	40
2	55½	2664.38	0.50	0.25		41	42	1.5	250	70	40
3	57	2664.97	0.40	0.20		41	43	1.0	250	70	40
4	58½	2665.51	0.43	0.21		42	44	1.0	250	70	40
5	10:00	2666.19	0.38	0.19		42	44	1.0	250	70	40
6	1½	2666.77	0.45	0.23		43	45	1.5	250	70	40
7	3	2667.45	0.48	0.24		43	45	1.5	250	70	40
8	4½	2668.19	0.50	0.24		44	47	1.5	250	70	40
9	6	2668.85	0.62	0.31		45	47	2.0	250	70	40
10	7½	2669.60	0.90	0.45		45	49	3.0	250	70	40
11	9	2670.48	1.15	0.62		45	48	4.0	250	70	40
12	10½	2671.45	1.35	0.67		47	49	3.5	250	70	40
13	12	2672.53	1.45	0.72		48	51	4.5	250	70	40
14	13½	2673.65	1.45	0.72		50	53	5.0	250	70	40
15	15	2674.78	1.35	0.67		52	54	3.5	250	70	40
16	16½	2675.82	1.35	0.67		53	57	3.5	250	70	40
17	18	2676.80	1.40	0.70		55	58	4.0	250	70	40
18	19½	2677.87	1.45	0.72		55	58	4.0	250	70	40
19	21	2678.98	1.40	0.70		57	59	4.0	250	70	40
20	22½	2680.10	1.10	0.55		56	60	2.5	250	70	40
	24	2681.15									

* Purge where required

Sample Time = ____ Net Volume = ____ | Avg. $\sqrt{\Delta P}$ | Avg. ΔH | Avg. Meter Temp. °F | Avg. Stack Temp. °F

*NA - Not Applicable

IMPINGER CATCH

Sample No. 1

Impinger No.	Solution Used	Amount of Solution (ml)	Imp. Tip Configuration	Weight (grams)
1	DI H_2O			Final ____ Initial ____ Wt. gain ____
2	DI H_2O			Final ____ Initial ____ Wt. gain ____
3	BLANK			Final ____ Initial ____ Wt. gain ____
4	SILICA GEL			Final ____ Initial 738.3 Wt. gain ____
5				Final ____ Initial ____ Wt. gain ____
6				Final ____ Initial ____ Wt. gain ____
Flask				Final ____ Initial ____ Wt. gain ____

TOTAL WEIGHT GAIN OF IMPINGERS (grams) ____

Date ____

Signature ____

ORSAT ANALYSIS RESULTS

Gas Fractional Part

CO_2 ____

O_2 ____

CO ____

N_2 ____

Date ____

Time ____

Signature ____ NUS CORPORATIO

STACK SAMPLING FIELD DATA

Plant Name Union - Carbide Stack Name Frit Ore Bed

Date 3-7-80 Oper. PSC Sample # 1 Stack Height ____

Stack dia. (exit) ____ Stack dia. (port) ____ Stack Press. " H_2O -0.64 Bar. Press. " Hg ____

Probe # ____ PTCF ____ DGMCF ____ Nozzle # ____

Nozzle area 0.0098 Filter # ____ Int. wt. gms. ____ Orifice Constants: a NA, b NA

Meter # Dry K factor NA* 0.50 Pump # NA

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
B-1	10:41	2681.15	1.05	0.50				3.0	250	70	38
2	42½	2681.98	1.10	0.55				3.5	250	70	38
3	44	2682.93	1.05	0.52				2.5	250	70	38
4	45½	2683.93	0.95	0.47				2.0	250	70	38
5	47	2684.82	0.84	0.42				2.0	250	70	38
6	48½	2685.67	0.82	0.41				2.0	250	70	38
7	50	2686.52	0.78	0.39				2.0	250	70	38
8	51½	2687.39	0.75	0.37				2.0	250	70	38
9	53	2688.23	0.80	0.40				2.5	250	70	38
10	54½	2689.05	1.05	0.52				2.5	250	70	38
11	56	2690.05	0.98	0.49				2.0	250	70	38
12	57½	2691.01	0.90	0.45				2.0	250	70	38
13	59	2691.89	0.70	0.35				2.0	250	70	38
14	11:0½	2692.65	0.75	0.37				2.0	250	70	38
15	2	2693.49	0.80	0.40				2.0	250	70	38
16	3½	2694.35	0.95	0.47				2.5	250	70	38
17	5	2695.25	0.90	0.45				2.5	250	70	38
18	6½	2696.17	0.90	0.45				2.5	250	70	38
19	8	2697.09	0.94	0.47				2.5	250	70	38
20	9½	2697.95	1.15	0.57				2.0	250	70	38
	11	2699.04									
			0.944	0.46						70	

* Purge where required

Sample Time: 60 Net Volume: 3539 Avg. $\sqrt{\Delta P}$ Avg. ΔH Avg. Meter Temp. °F Avg. Stack Temp. °F

*NA - Not Applicable

STACK SAMPLING FIELD DATA

Plant Name Union - Carbide Stack Name Fine Ore Bend

Date 3-7-80 Oper. PSC Sample # 2 Stack Height ____

Stack dia. (exit) ____ Stack dia. (port) ____ Stack Press. " H_2O -.64 Bar. Press. " Hg ____

Probe # ____ PTCF ____ DGMCF ____ Nozzle # ____

Nozzle area 0.00018 Filter # 3008 Int. wt. gms. ____ Orifice Constants: a NA, b NA

Meter # Dry K factor NA* 0.50 Pump # NA

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
B-1	11:52	2699.75	1.05	0.52				3.0	250	70	35
2	53½	2700.62	1.20	0.60				4.0	250	70	35
3	55	2701.60	1.10	0.55				4.0	250	70	35
4	56½	2702.60	1.00	0.50				3.0	250	70	35
5	58	2703.53	0.85	0.42				2.5	250	70	35
6	59½	2704.39	0.80	0.40				2.5	250	70	35
7	12:01	2705.25	0.72	0.36				2.0	250	70	35
8	2½	2706.00	0.65	0.33				2.0	250	70	35
9	4	2706.65	0.90	0.45				2.5	250	70	35
10	5½	2707.50	0.95	0.47				2.5	250	70	35
11	7	2708.40	0.95	0.47				2.5	250	70	35
12	8½	2709.29	0.90	0.45				2.0	250	70	35
13	10	2710.19	0.75	0.37				2.0	250	70	35
14	11½	2710.98	0.70	0.35				2.0	250	70	35
15	13	2711.68	0.74	0.37				2.5	250	70	35
16	14½	2712.47	0.80	0.40				2.5	250	70	35
17	16	2713.30	0.80	0.40				3.0	250	70	35
18	17½	2714.12	0.95	0.47				3.0	250	70	35
19	19	2714.98	1.05	0.52				3.0	250	70	35
20	20½	2715.92	1.15	0.57				4.0	250	70	35
	22	2716.85									

* Purge where required

Sample Time = ____ Net Volume: ____ Avg. $\sqrt{\Delta P}$ Avg. ΔH Avg. Meter Temp. °F Avg. Stack Temp. °F

*NA - Not Applicable

IMPINGER CATCH

Sample No. _____

Impinger No.	Solution Used	Amount of Solution (ml)	Imp. Tip Configuration	Weight (grams)
1	DI H_2O			Final _____ Initial 100 Wt. gain _____
2	DI H_2O			Final _____ Initial 107 Wt. gain _____
3	BLANK			Final _____ Initial 0 Wt. gain _____
4	SILICA GEL			Final _____ Initial 7322 Wt. gain _____
5				Final _____ Initial _____ Wt. gain _____
6				Final _____ Initial _____ Wt. gain _____
Flask				Final _____ Initial _____ Wt. gain _____

TOTAL WEIGHT GAIN OF IMPINGERS (grams) _____

Date _____

Signature _____

ORSAT ANALYSIS RESULTS

Gas	Fractional Part
CO_2	
O_2	
CO	
N_2	

Date _____

Time _____

Signature _____

STACK SAMPLING FIELD DATA

Plant Name Union - Carbide Stack Name Fine Ore Bead.

Date 3-7-80 Oper. PSC Sample # 2 Stack Height ___

Stack dia. (exit) ___ Stack dia. (port) ___ Stack Press. " H_2O -0.64 Bar. Press. " Hg ___

Probe # ___ PTCF ___ DGMCF ___ Nozzle # ___

Nozzle area 0.00018 Filter # ___ Int. wt. gms. ___ Orifice Constants a NA, b NA

Meter # Dry K factor NA* 0.50 Pump # NA

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
A-1	11.33	2716.85	0.50	0.25		42	44	1.5	250	70	32
2	34½	2717.42	0.45	0.23		43	45	1.5	250	70	32
3	36	2718.10	0.45	0.23		43	45	1.5	250	70	32
4	37½	2718.71	0.40	0.20		44	47	1.5	250	70	32
5	39	2719.42	0.40	0.20		45	46	1.5	250	70	32
6	40½	2720.06	0.42	0.21		46	47	1.5	250	70	32
7	42	2720.60	0.48	0.24		46	48	1.5	250	70	32
8	43½	2721.29	0.58	0.29		47	48	2.0	250	70	32
9	45	2722.04	0.60	0.30		47	49	2.0	250	70	32
10	46½	2722.75	0.90	0.45		48	50	2.5	250	70	32
11	48	2723.60	1.35	0.67		49	51	4.0	250	70	32
12	49½	2724.50	1.45	0.72		49	52	5.0	250	70	32
13	51	2725.58	1.35	0.67		50	53	4.5	250	70	32
14	52½	2726.62	1.40	0.70		51	54	5.0	250	70	32
15	54	2727.72	1.50	0.75		51	54	5.0	250	70	32
16	55½	2728.82	1.45	0.72		52	55	5.0	250	70	32
17	57	2729.89	1.35	0.67		53	55	5.0	250	70	32
18	58½	2730.92	1.25	0.62		54	56	4.0	250	70	32
19	1:00	2731.90	1.05	0.52		54	57	3.0	250	70	32
20	1½	2732.85	0.95	0.42		55	58	2.5	250	70	32
	3	2733.70									

* Purge where required

			0.937	0.46		70
Sample Time = 60			Avg. $\sqrt{\Delta P}$	Avg. ΔH	Avg. Meter Temp. °F	Avg. Stack Temp. °F
Net Volume: 33.95						

*NA - Not Applicable

STACK SAMPLING FIELD DATA

Plant Name Union - Carbide Stack Name FINE ORE BEND

Date 3-7-80 Oper. PSC Sample # 3 Stack Height ___

Stack dia. (exit) ___ Stack dia. (port) ___ Stack Press. " H_2O -0.64 Bar. Press. " Hg ___

Probe # ___ PTCF ___ DGMCF ___ Nozzle # ___

Nozzle area ___ Filter # 3023 Int. wt. gms. ___ Orifice Constants a NA, b NA

Meter # Sony K factor NA* 0.50 Pump # NA

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
1	2:08	2734.01	1.15	0.57				5.0	250	70	30
2	9½	2734.92	1.15	0.57				5.0	250	70	30
3	11	2736.00	1.10	0.55				5.0	250	70	30
4	12½	2737.02	1.00	0.50				4.5	250	70	30
5	14	2737.95	0.80	0.40				3.5	250	70	30
6	15½	2738.78	0.84	0.42				4.0	250	70	30
7	17	2739.65	0.75	0.37				3.0	250	70	30
8	18½	2740.48	0.75	0.37				3.0	250	70	30
9	20	2741.35	0.84	0.42				3.5	250	70	30
10	21½	2742.21	1.00	0.50				5.0	250	70	30
11	23	2743.20	1.00	0.50				5.0	250	70	30
12	24½	2744.09	1.00	0.50				5.0	250	70	30
13	26	2745.00	0.85	0.42				3.5	250	70	30
14	27½	2745.80	0.78	0.39				3.0	250	70	30
15	29	2746.62	0.75	0.37				3.0	250	70	30
16	30½	2747.45	0.75	0.37				3.0	250	70	30
17	32	2748.30	0.84	0.42				3.5	250	70	30
18	33½	2749.13	0.95	0.47				4.0	250	70	30
19	35	2750.04	1.10	0.55				5.0	250	70	30
20	36½	2751.00	1.15	0.57				5.0	250	70	30
	38	2752.00									

* Purge where required

Sample Time = ___ Net Volume = ___ Avg. $\sqrt{\Delta P}$ Avg. ΔH Avg. Meter Temp. °F Avg. Stack Temp. °F

*NA - Not Applicable

STACK SAMPLING FIELD DATA

Plant Name Union - Carbide Stack Name Fine Ore Bead.

Date 3-7-80 Oper. _____ Sample # 3 Stack Height _____

Stack dia. (exit) ___ Stack dia. (port) ___ Stack Press. " H_2O -.64 Bar. Press. " Hg ___

Probe # _____ PTCF _____ DGMCF _____ Nozzle # _____

Nozzle area 0.00018 Filter # _____ Int. wt. gms. _____ Orifice Constants: a NA, b NA

Meter # Toy K factor NA* 0.50 Pump # NA

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
A-1	2:52	2752.00	0.50	0.25				2.0	250	70	30
2	53½	2755.66	0.48	0.24				2.0	250	70	30
3	55	2753.37	0.42	0.21				2.0	250	70	30
4	56½	2753.98	0.40	0.20				2.0	250	70	30
5	58	2754.52	0.40	0.20				2.0	250	70	30
6	59½	2755.17	0.42	0.21				2.0	250	70	30
7	3:01	2755.68	0.50	0.25				2.0	250	70	30
8	2½	2756.35	0.54	0.27				2.0	250	70	30
9	4	2757.10	0.65	0.32				2.5	250	70	30
10	5½	2757.70	0.78	0.39				3.0	250	70	30
11	7	2758.54	1.20	0.60				5.0	250	70	30
12	8½	2759.43	1.30	0.65				5.0	250	70	30
13	10	2760.47	1.25	0.62				5.0	250	70	30
14	11½	2761.48	1.25	0.62				5.0	250	70	30
15	13	2762.51	1.15	0.57				5.0	250	70	30
16	14½	2763.48	1.20	0.60				5.0	250	70	30
17	16	2764.49	1.25	0.62				5.5	250	70	30
18	17½	2765.55	1.30	0.65				5.5	250	70	30
19	19	2766.50	1.10	0.55				5.0	250	70	30
20	20½	2767.48	1.00	0.50				5.0	250	70	30
	22	2768.43									
				Leak check		@ 9" Hg		0.01 cfm			
			0.931	0.45						70	

* Purge where required

Sample Time = 60 Net Volume: 34.42 Avg. $\sqrt{\Delta P}$ Avg. ΔH Avg. Meter Temp. °F Avg. Stack Temp. °F

*NA - Not Applicable

STACK SAMPLING FIELD DATA

Plant Name _____ Stack Name Storage Bin Transfer

Date 3-7-80 Oper. JDS Sample # 1 Stack Height _____

Stack dia. (exit) ___ Stack dia. (port) ___ Stack Press. " H_2O ___ Bar. Press. " Hg ___

Probe # _____ PTCF _____ DGMCF _____ Nozzle # V8

Nozzle area _____ Filter # Set #15 Int. wt. gms. _____ Orifice Constants a. NA b. NA

Meter # 704 K factor NA* Pump # NA

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
Impactor 1	3:50	276.854	1.0	.2		45	60	8½		70	39
	3:55	277.263	1.0	.2		46	63	9		70	38
	4:00	↓	1.0	.2		47	65	9		70	38
		277.263									

* Purge where required

Sample Time = _____ Net Volume = _____ Avg. ΔP _____ Avg. ΔH _____ Avg. Meter Temp. °F _____ Avg. Stack Temp. °F _____

*NA - Not Applicable

STACK SAMPLING FIELD DATA

Plant Name _____ Stack Name STORAGE BIN TRANSFER

Date 3-7-80 Oper. _____ Sample # 2 Stack Height _____

Stack dia. (exit) ___ Stack dia. (port) ___ Stack Press. " H_2O ___ Bar. Press. " Hg ___

Probe # _____ PTCF _____ DGMCF _____ Nozzle # 1/8

Nozzle area _____ Filter # Set 16 Int. wt. gms. _____ Orifice Constants a NA b NA

Meter # _____ K factor NA* Pump # NA

Pt.	Clock Time	Dry Gas Meter Reading	ΔPn in H_2O	ΔHn in H_2O	Probe Htr. Temp. °F	Dry Gas Meter Temperature Inlet	Dry Gas Meter Temperature Outlet	L. Vac. In. Hg Gauge	Box Temp °F	Stack Temp °F	Last Imp. Temp. °F
Impacta 1	4:24	277263	1.0	0.2		48	60	8½		70	38
	4:29		1.0	0.2		49	63	9.0		70	38
	4:34					50	66			70	38
		277620									

* Purge where required

Sample Time = _____ Net Volume: _____ Avg. $\sqrt{\Delta P}$ | Avg. ΔH | Avg. Meter Temp. °F | Avg. Stack Temp. °F

APPENDIX B

LABORATORY RESULTS

UNION CARBIDE

VELOCITY AND FLOW RESULTS

Source	Run	Filter No.	Filter Weight, Grams		
			Final	Tare	Gain
AK Leach Stack	1	3013	52.1973	51.6280	0.5693
	2	3012	52.0075	51.5733	0.4342
	3	3017	51.7895	51.3332	0.4563
Fine Ore Bend	1	3016	51.6686	51.3034	0.3652
	2	3008	51.1732	50.8559	0.3173
	3	3023	51.7999	51.4287	0.3712
YC Dryer Stack	1	-	0.7206	0.6673	0.0533
	2	-	0.6901	0.6700	0.0201
	3	-	0.7171	0.6673	0.0498
Leach Stack	1	3006	51.6616	51.3694	0.2922
	2	3014	51.2786	50.9095	0.3691
	3	3019	51.4672	51.0446	0.4226
Aerofall Stack #1	1	205	41.6723	41.2985	0.3738
	2	218	41.9895	41.5579	0.4316
	3	3007	51.7272	51.3603	0.3669
Aerofall Stack #2	1	-	0.6777	0.6652	0.0125
	2	-	0.6683	0.6729	-0.0046
	3	3010	51.7872	51.4486	0.3386
Aerofall Stack #3	1	-	0.7331	0.6737	0.0594
	2	-	0.7316	0.6732	0.0584
	3	3006	51.6616	51.3694	0.2922
Aerofall Stack #4	1	212	41.8026	41.3651	0.4375
	2	202	42.0420	41.5507	0.4913
	3	3005	51.7797	51.2668	0.5129

Form DL-2, Rev.1

0574
MAR 1 2 1980

To: Dave Bartrum

UNION CARBIDE CORPORATION
MINING AND METALS DIVISION
DEVELOPMENT LABORATORY
GRAND JUNCTION, COLORADO

CERTIFICATE OF ANALYSIS
RADIOLOGICAL CONTROLS

REPORT TO: G.L. Schierman
R.K. Jones
E.C. Loshbaugh
H.B. Perry
P.C. Rekemeyer

Submitted by: R.K. Jones
Plant: UCC-Uravan
Date Submitted: 3/11/80

Charge to: 57310-7927-0002-0000-02098

Check for desired analysis and forward this form with samples

Analytical No.	Sample Description: Uravan Stack Sampling	Date Sample Taken	Initials of Sampler	Liquids: Ra-226 ~~uCi x 10⁻⁸ per ml.~~ pCi/L	Th-230 ~~uCi x 10⁻⁶ per ml.~~ pCi/mL	U-Nat. ~~uCi x 10⁻¹⁵ per ml.~~ pCi/mL	~~Dust~~ ~~U-Nat. Total ug U~~	V205 Total mg./L	Pb-210 pCi/mL
—	~~Yc Drier Run #1 Filter~~								
882	Yc Drier Run #1 Impinger			12.75 ± 2.49	.361 ± .018	23.9387		.54	71.79 ± 39.34
883	Yc Drier Run #1 Probe Wash.			13.00 ± 4.27	.009 ± .009	1.6647		<.01	15.0 ± 15.0
—	~~Yc Drier Run #2 Filter~~								
884	Yc Drier Run #2 Impinger			9.28 ± 2.23	.151 ± .011	25.3198		.54	162.54 ± 40.91
885	Yc Drier Run #2 Probe Wash.			13.25 ± 4.29	.020 ± .010	1.2633		<.01	15.0 ± 15.0
—	~~Yc Drier Run #3 Filter~~								
886	Yc Drier Run #3 Impinger			6.96 ± 1.99	.184 ± .013	26.6941		.89	87.74 ± 39.58
887	Yc Drier Run #3 Probe Wash			15.75 ± 4.57	.015 ± .009	1.2633		<.01	15.0 ± 15.0
—	~~Aerofall Stack #4 Run 1 Filter~~								
888	Aerofall Stack #4 Run 1 Impinger			3.35 ± 1.57	.002 ± .002	.1036		<.01	18.97 ± 18.97
889	Aerofall Stack #4 Run 1 Probe Wash			40.63 ± 11.55	.019 ± .019	.1090		.14	15.0 ± 15.0
—	~~Aerofall Stack #4 Run 2 Filter~~								
890	Aerofall Stack #4 Run 2 Impinger			128.58 ± 7.76	.117 ± .010	.1489		.54	18.97 ± 18.97
891	Aerofall Stack #4 Run 2 Probe Wash.			200.03 ± 22.72	.081 ± .029	.2410		.42	15.0 ± 15.0
Initials of Analyst				[illegible]	[illegible]	RKM		MDB	DJS/DS

Reported by: E.C. Loshbaugh HBB   Date: 4/17/80

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UNION CARBIDE CORPORATION
MINING AND METALS DIVISION
DEVELOPMENT LABORATORY
GRAND JUNCTION, COLORADO

0571
MAR 1 2 1980

CERTIFICATE OF ANALYSIS
RADIOLOGICAL CONTROLS

RT TO: G.L. Schierman
R.K. Jones
E.C. Loshbaugh
H.B. Perry
P.C. ReRemeyer

Submitted by: R.K. Jones
Plant: UCC - URAVAN
Date Submitted: 3/19/80

Charge to: 57310 · 7927 - 0002 - 0000 - 02098

tical de No.	Sample Description	Date Sample Taken	Initials of Sampler	Check for desired analysis and forward this form with samples					
				Liquids			~~Dust~~		
				Ra-226 ~~uCi x 10^{-8} per ml.~~ pCi/L	Th-230 ~~uCi x 10^{-6} per ml.~~ pCi/mL	U-Nat. ~~uCi x 10^{-5} per ml.~~ pCi/mL	U-Nat. Total ug/U	V205 Total mg./L	Pb-210 pCi/mL
0892	Aerofall St. #4 Run 3 Impinger			140.56 ± 7.67	.002 ± .002	.3155		<.01	41.71 ± 22.73
0893	Aerofall St. #4 Run 3 Probe Wash			151.27 ± 19.98	.046 ± .029	.2870		.86	15.0 ± 15.0
0894	Aerofall St. #3 Run 1 Impinger			200.33 ±	.209 ± .013	.2694		<.01	104.32 ± 39.87
0895	Aerofall St #3 Run 1 Probe Wash			352.05 ± 18.54	.006 ± .006	.2295		.12	15.0 ± 15.0
0896	Aerofall St. #3 Run 2 Impinger			57.58 ± 5.99	.087 ± .009	.3155		.54	139.52 ± 40.51
0897	Aerofall St. #3 Run 2 Probe Wash			232.18 ± 15.14	.178 ± .023	.3385		.16	15.0 ± 15.0
0898	Aerofall St. #3 Run 3 Impingee			200.53 ± 9.13	.219 ± .014	.1489		1.61	77.69 ± 39.39
0899	Aerofall St. #3 Run 3 Probe Wash			142.77 ± 11.95	.007 ± .007	.1550		.16	15.0 ± 15.0
0900	Aerofall St. #2 Run 1 Impinger			23.37 ± 3.25	.006 ± .003	.0575		.26	152.47 ± 40.73
0901	Aerofall St. #2 Run 1 Probe Wash			17.50 ± 4.75	.037 ± .012	.0860		.23	15.0 ± 15.0
0902	Aerofall St. #2 Run 2 Impinger			28.82 ± 3.57	.010 ± .004	.1604		.17	160.68 ± 39.81
0903	Aerofal St. #2 Run 2 Probe Wash			112.09 ± 17.43	.260 ± .046	.8611		.48	15.0 ± 15.0
0904	Aerofall St. #2 Run 3 Impinger			1.15 ± 1.15	.002 ± .002	.0514		<.01	202.81 ± 41.61
0905	Aerofall St. #2 Run 3 Probe Wash.			45.33 ± 7.01	.132 ± .020	.0975		.29	15.0 ± 15.0
als of Analyst				AMS	AMS	KEM		AMS	DJS/DS

Reported by: E.C. Loshbaugh Date: 4/17/80

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UNION CARBIDE CORPORATION
MINING AND METALS DIVISION
DEVELOPMENT LABORATORY
GRAND JUNCTION, COLORADO

CERTIFICATE OF ANALYSIS
RADIOLOGICAL CONTROLS

REPORT TO: G.L. Schierman
R.K. Jones
E.C. Lostbaugh
H.B. Perry
P.C. McKenzie

Submitted by: R.K. Jones
Plant: UCC. URAVAN
Date Submitted: 3/10/80

Charge to: 57310-7927-0002-0000-02694

Analytical Code No.	Sample Description: URAVAN Stack Sampling	Date Sample Taken	Initials of Sampler	Check for desired analysis and forward this form with samples: Liquids Ra-226 ~~uCi x 10⁻⁹ per ml.~~ pCi/L	Liquids Th-230 ~~uCi x 10⁻⁶ per ml.~~ pCi/mL	Liquids U-Nat. ~~uCi x 10⁻³ per ml.~~ pCi/mL	~~Dust~~ U-Nat. Total ug U	~~Dust~~ V205 Total mg/L	Pb-210 pCi/mL
0906	Aerofall St. #1 Run1 Impinger			2.06 ± 2.04	.005 ± .005	.0345		<.01	211.44 ± 41.76
0907	Aerofall St. #1 Run1 Probe Wash			91.53 ± 15.95	.123 ± .034	.0860		.16	15.0 ± 15.0
0908	Aerofall St. #1 Run2 Impinger			1.18 ± 1.18	.002 ± .002	.0575		<.01	240.21 ± 42.26
0909	Aerofall St. #1 Run2 Probe Wash.			24.29 ± 5.67	.033 ± .023	.0690		.05	15.9 ± 15.0
0910	Aerofall St. #1 Run3 Impinger			1.13 ± 1.13	.002 ± .002	.1036		<.01	195.62 ± 41.49
0911	Aerofall St. #1 Run3 Probe Wash			307.62 ± 27.78	.244 ± .045	.0284		<.01	15.0 ± 15.0
0912	F.O.B. St. Run1 Impinger			4.77 ± 2.79	.005 ± .005	.0690		<.01	148.16 ± 40.66
0913	F.O.B. St. Run1 Probe Wash			92.16 ± 16.00	.121 ± .033	.1381		.36	15.9 ± 15.0
0914	F.O.B. St. Run2 Impinger			3.92 ± 2.65	.002 ± .002	.1090		<.01	228.71 ± 42.06
0915	F.O.B. St. Run2 Probe Wash			108.35 ± 17.17	.098 ± .031	.0575		.32	15.0 ± 15.0
0916	F.O.B. St. Run3 Impinger			2.05 ± 2.05	.002 ± .002	.0630		<.01	115.07 ± 40.06
0917	F.O.B. St. Run3 Probe Wash.			135.13 ± 18.94	.072 ± .028	.0690		.35	15.0 ± 15.0
0918	AK. leach Run1 Impinger			4.08 ± 4.08	.009 ± .009	.0921		<.01	158.22 ± 40.84
0919	AK. leach Run1 Probe Wash			878.02 ± 46.22	4.314 ± .174	.1550		5.70	9431.1 ± 477.4
Initials of Analyst				JMC	JMC	K-Kuy		mgB	DSS/DS

Reported by: E C Lostbaugh H Perry Date: 4/17/80

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UNION CARBIDE CORPORATION
MINING AND METALS DIVISION
DEVELOPMENT LABORATORY
GRAND JUNCTION, COLORADO

CERTIFICATE OF ANALYSIS
RADIOLOGICAL CONTROLS

REPORT TO: G. L. Schierman
R. K. Jones
E. C. Lashbaugh
H. B. Perry
P. C. Rekemeyer

Submitted by: R. K. Jones
Plant: U.C.C. - URAVAN
Date Submitted: 3/10/80

Charge to: 57310 - 7427 - 0002 - 0000 - 02098

Analytical Code No.	Sample Description	Date Sample Taken	Initials of Sampler	Check for desired analysis and forward this form with samples: Liquids — Ra-226 (~~uCi x 10⁻⁸ per ml~~ pCi/L)	Th-230 (~~uCi x 10⁻⁶ per mL~~ pCi/mL)	U-Nat. (~~uCi x 10⁻⁵ per ml~~ pCi/mL)	~~U-Nat. Total ug/L~~	V2O5 Total mg/L	~~Ra-226~~ Pb-210 pCi/mL
0920	URAVAN Stack Sampling A.K. Leach Run 2 Impinger			2.26 ± 2.26	.009 ± .006	.0514		< .01	93.50 ± 39.69
0921	A.K. Leach Run 2 Probe Wash			48.32 ± 7.21	1.086 ± .055	.0575		< .01	1060.7 ± 192.0
0922	A.K. Leach Run 3 Impinger			1.99 ± 1.99	.011 ± .006	.0284		< .01	115.07 ± 40.07
0923	A.K. Leach Run 3 Probe Wash			646.49 ± 39.79	.839 ± .078	.1550		.95	1483.9 ± 192.0
0924	Leach Run 1 Impinger			2.13 ± 2.13	.005 ± .005	.0230		< .01	181.24 ± 41.24
0925	Leach Run 1 Probe Wash			185.57 ± 21.89	.031 ± .023	.4590		< .01	15.0 ± 15.0
0926	Leach Run 2 Impinger			1.19 ± 1.19	.002 ± .002	.0514		< .01	165.42 ± 40.96
0927	Leach Run 2 Probe Wash			88.09 ± 15.66	.145 ± .036	.0975		< .01	15.0 ± 15.0
0928	Leach Run 3 Impinger			5.34 ± 1.73	.006 ± .003	.0575		< .01	18.97 ± 18.97
0929	Leach Run 3 Probe Wash			8.13 ± 8.13	.008 ± .008	.0575		< .01	15.0 ± 15.0
				pCi/pad	pCi/pad	pCi/pad		mg/pad	pCi/pad
0930	Filter # 3010			21.87 ± 1.82	582.88 ± 32.58	63.15		.50	78.39 ± 20.41
0931	Filter # 3007			45.90 ± 2.61	71.08 ± 11.38	86.11		.87	15.0 ± 15.0
0932	Filter # 3006			38.29 ± 2.39	314.19 ± 23.92	132.04		.68	142.40 ± 21.50
0933	Filter # 3005			64.35 ± 3.06	84.35 ± 12.39	86.11		1.07	15.0 ± 15.0
0934	Filter # 202			23.58 ± 1.98	272.01 ± 22.35	56.83		.68	17.61 ± 22.00
Initials of Analyst				AWC	TMC	RKM		MAB	DJS/DS

Reported by: EC Lashbaugh Date: 4/17/80

Form DL-2. Rev.1

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UNION CARBIDE CORPORATION
MINING AND METALS DIVISION
DEVELOPMENT LABORATORY
GRAND JUNCTION, COLORADO

CERTIFICATE OF ANALYSIS
RADIOLOGICAL CONTROLS

REPORT TO: G.L. Schierman
R.K. Jones
E.C. Loshbaugh
H.B. Perry
P.C. Rekemeyer

Submitted by: R.K. Jones
Plant: U.C.C. - Uravan
Date Submitted: 3/11/80

Charge to: 57310-7927-0002-0000-02098

Check for desired analysis and forward this form with samples

Analytical Code No.	Sample Description: Uravan Stack Sampling	Date Sample Taken	Initials of Sampler	Liquids: Ra-226 ~~uCi x 10⁻⁸ per ml.~~ pCi/pad	Liquids: Th-230 ~~uCi x 10⁻⁶ per ml.~~ pCi/pad	Liquids: U-Nat. ~~uCi x 10⁻⁵ per ml.~~ pCi/pad	Dust: ~~U-Nat. Total ug U~~	Dust: V205 Total mg./pad	Pb-210 pCi/pad
0935	yc. Drier Run 1 Filter			3.23 ±.77	50.23 ±9.56	21511.38		.61	35.48 ±23.52
0936	yc. Drier Run 2 Filter			1.79 ±.62	169.65 ±12.57	7664.16		.21	22.94 ±22.94
0937	yc Drier Run 3 Filter			2.09 ±.66	120.84 ±14.83	21511.38		.46	105.67 ±24.62
0938	Aerofall St. #4 Run 1 Filter			10.68 ±1.29	86.25 ±12.53	137.76		.21	50.57 ±23.76
0939	" " #4 Run 2 Filter			9.12 ±1.19	24.64 ±6.70	32.73		.23	67.18 ±24.02
0940	Aerofall St. #3 Run 1 Filter			96.79 ±3.74	173.92 ±12.79	671.69		2.43	296.64 ±27.3[illegible]
0941	" " " Run 2 Filter			102.97 ±3.85	170.60 ±17.62	384.64		3.21	346.46 ±28.07
Initials of Analyst				[illegible]	[illegible]	RKm		mPB	DJS/DS

Reported by: EC Loshbaugh / [illegible] Date: 4/17/80

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MAR 1 2 1980

UNION CARBIDE CORPORATION
MINING AND METALS DIVISION
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CERTIFICATE OF ANALYSIS
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ORT TO: G.L. Schierman
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Submitted by: R.K. Jones
Plant: U.C.C. - URAVAN
Date Submitted: 3/11/80

Charge to: 57310-7927-0002-0000-02098

ytical de No.	Sample Description	Date Sample Taken	Initials of Sampler	Check for desired analysis and forward this form with samples					
				~~Liquids~~			Dust		
				Ra-226 ~~uCi x 10^{-8} per ml.~~ pCi/pad	Th-230 ~~uCi x 10^{-6} per ml.~~ pCi/pad	U-Nat. ~~uCi x 10^{-5} per ml.~~ pCi/pad	U-Nat. Total ug/U	V205 Total mg./pad	Pb-210 pCi/pad
0942	Filter # 212			39.68 ± 2.41	63.50 ± 10.75	74.63		.75	96.62 ± 24.4
0943	" 218			2.12 ± .65	44.54 ± 9.00	74.63		.89	162.29 ± 25.4
0944	" 205			34.94 ± 5.24	165.38 ± 17.35	298.53		2.53	227.20 ± 26.4
0945	" 3013			257.55 ± 14.20	306.60 ± 23.63	533.91		9.03	319.29 ± 27.70
0946	" 3016			37.90 ± 5.45	74.40 ± 11.64	74.63		.68	155.49 ± 25.3
0947	" 3012			55.05 ± 6.84	85.30 ± 12.46	109.08		1.73	69.44 ± 23.98
0948	" 3017			2.94 ± 2.59	54.97 ± 10.00	74.63		1.02	64.16 ± 23.98
0949	" 3019			2.16 ± 2.16	15.16 ± 5.25	12.06		.14	22.94 ± 22.94
0950	" 3014			2.27 ± 2.27	15.44 ± 5.34	18.94		.16	22.94 ± 22.94
0951	" 3009			2.53 ± 2.52	32.22 ± 7.65	22.96		.11	22.94 ± 22.94
0952	" 3023			20.26 ± 4.46	44.07 ± 8.96	38.47		.32	38.49 ± 23.57
0953	" 3008			422.76 ± 18.11	88.36 ± 12.66	91.86		.86	24.15 ± 23.3
0954	3 inch Filter Blank	will send later.		26.24 ± 4.95	29.30 ± 7.29	8.03		.09	22.94 ± 22.9
0955	4 inch Filter Blank			never arrived!					
	~~Rinse Water~~								
				pCi/L	pCi/mL	pCi/mL		mg/L	pCi/mL
0956	Rinse Water			7.42 ± 5.37	.462 ± .039	<.0010		<.01	22.94 ± 22.9
0957	Acetone			11.20 ± 11.20	.029 ± .011	<.0010		<.01	22.94 ± 22.9
ls of Analyst				dpm/c	d/m/c	Rkm		mDB	DSS/DS

Reported by: E.C. Loshbaugh Date: 4/17/80

APPENDIX C

CALCULATION SUMMARY

VELOCITY AND VOLUMETRIC FLOW RATE EQUATIONS

Equation 1-1

$$V_s = 85.48\ C_p \sqrt{\frac{T_s}{M_s \times P_s}} \quad (\sqrt{\Delta P})\ \text{avg}$$

where:

V_s = Average stack velocity, ft per second (fps)

C_p = pitot tube coefficient, dimensionless

C_p = 0.83

T_s = absolute average stack gas temperature, ^oR

M_s = molecular weight of stack gas, lb/lb-mole

P_s = absolute stack pressure, in Hg

$(\sqrt{\Delta P})$ avg = average square root of the velocity head, in H_2O

Equation 1-2a

$$Q_a = 3600 \frac{\text{sec}}{\text{hour}} \times V_s \times A_s$$

where:

Q_a = volumetric stack gas flow rate, actual ft^3 /hr (ACF/hr)

A_s = cross-sectional area of stack, ft^2

Equation 1-2b

$$Q_s = Q_a \times \frac{T\ std}{T\ (avg)} \times \frac{P_s}{P\ std}$$

where: Q_s = volumetric stack gas flow rate corrected to standard conditions, scf/hr.

T std = standard absolute temperature, 528 °R (68°F)

P std = standard absolute pressure, 29,92 in. Hg.

Equation 1-2c

$$Q_{sd} = Q_s \times (1 - B_{ws})$$

where: Q_{sd} = dry volumetric stack gas flow rate corrected to standard conditions, dscf/hr.

B_{ws} = proportion of moisture in sample

SAMPLE VOLUME CALCULATIONS

Equation 2-1

$$V_{m(std)} = 17.64 \; Y \; \frac{V_m \left(P_m + \frac{\Delta H}{13.6}\right)}{T_m}$$

where: $V_{m(std)}$ = dry gas volume measured by the dry gas meter, corrected to standard conditions, dscf

Y = dry gas meter calibration factor = 1 for meter used

V_m = dry gas volume measured by dry gas meter, dcf

P_m = absolute pressure of meter, in Hg

H = average pressure drop across orifice meter, in H_2O

T_m = average absolute temperature of meter, ^oR

CLIENT Union Carbide TASK NO. _____ By _____

SUBJECT Calculation Summary Checked By _____

$V_{m(std)} = 17.64 \, V_m \, K \, \frac{(P_{bar} + \Delta H/13.6)}{T_m}$

$B_{ws} = \frac{V_{w(std)}}{V_{w(std)} + V_{m(std)}}$

$MW = (1 - B_{ws})(29.2) + (B$

Source	Run	Y	P_{bar}	ΔH	T_m	V_m	$V_{m(std)}$	V_{lc}	B_{ws}	$(1-B_{ws})$	MW
AK Leach Stack	1	0.996	24.59	0.64	515	47.15	39.630	2.5	0.009	.9991	29.099
	2	0.996	24.59	0.65	524	44.42	36.695	10.0	0.013	0.987	29.054
	3	0.996	24.59	0.55	518	40.54	3[illegible]8	10.6	0.015	0.985	29.032
Fun: One Bed	1	0.996	24.59	0.46	515	35.39	29.729	21.2	0.032	0.968	28.842
	2	0.996	24.59	0.46	520	33.95	28.246	16.0	0.026	0.974	28.909
	3	0.996	24.59	0.45	525	34.42	28.363	15.4	0.025	0.975	28.920
YC Dryer Stack	1	1.00	24.64	1.07	535	58.12	47.369	264.0	0.208	0.792	26.870
	2	1.00	24.64	0.95	542	55.88	44.939	189.4	0.165	0.835	27.352
	3	1.00	24.69	1.08	527	58.49	48.396	191.8	0.157	0.843	27.442
Leach Stack	1	1.00	24.69	0.15	514	15.82	13.357	64.9	0.186	0.814	27.117
	2	1.00	24.59	0.56	519	28.01	23.449	98.3	0.165	0.835	27.352
	3	1.00	24.59	0.55	525	27.71	22.932	112.6	0.188	0.812	27.094
Aerofall Stack # 1	1	0.996	24.64	0.31	521	28.88	24.019	68.3	0.118	0.882	27.878
	2	0.996	24.64	0.33	517	31.17	26.126	76.0	0.120	0.880	27.856
	3	0.996	24.64	0.40	518	32.45	27.152	93.9	0.140	0.860	27.632
Aerofall # 2	1	1.00	24.56	1.20	525	42.32	35.049	96.5	0.115	0.885	27.912
	2	1.00	24.56	1.09	525	38.76	32.090	102.2	0.130	0.870	27.744
	3	1.00	24.56	0.41	520	32.80	27.411	99.5	0.146	.854	27.565
Aerofall #3	1	1.00	24.64	3.44	537	67.76	55.408	125.2	0.096	0.904	28.125
	2	1.00	24.64	3.56	532	70.63	58.318	87.6	0.066	0.934	28.461
	3	1.00	24.64	3.85	526	69.92	58.552	162.8	0.116	0.884	27.901
Aerofall #4	1	0.996	24.56	0.40	520	33.37	27.724	100.4	0.146	0.854	27.565
	2	0.996	24.56	0.40	521	34.18	28.343	71.5	0.106	0.894	28.013
	3	0.996	24.56	0.43	525	34.05	28.022	83.2	0.123	0.877	27.822

DATE

CLIENT Union Carbide TASK NO. By

SUBJECT Calculation Summary Checked By

$V_s = 85.49 \; C_p \sqrt{\frac{T_s}{MW \cdot P_s}} \; (\sqrt{\Delta P})_{AVG}$

$Q_{acfm} = 60 \cdot A_s \cdot V_s$

$Q_{dscfm} = 17.65 \; Q_{acfm} \; (1 - BW_s) \; \frac{P_s}{T_s}$

Source	Run	C_p	T_s	MW	P_s	$(\sqrt{\Delta P})_{AVG}$	V_s	A_s	Q_{acfm}	$(1-BW_s)$	P_s	T_s	Q_{DSCFM}
AK Leach Stack	1	0.826	515	29.099	24.52	1.115	66.892	0.785	3151	.9991	24.52	515	2624
	2	0.826	515	29.054	24.52	1.120	67.244	0.785	3167	0.987	24.52	515	2627
	3	0.826	515	29.032	24.52	1.120	67.270	0.785	3168	0.985	24.52	515	2623
Fume Oxe Lime	1	0826	530	28.842	24.54	0.944	57.684	7.069	24,466	0.968	24.54	530	19,355
	2	0.826	530	28.909	24.54	0.937	57.190	7.069	24,257	0.974	24.54	530	19,308
	3	0.826	530	28.920	24.54	0.931	56.813	7.069	24,097	0.975	24.54	530	19,200
YC Dryer Stack	1	086	593	26.870	24.57	0.240	16.723	3.000	3010	0.792	24.57	593	1,743
	2	086	578	27.352	24.57	0.230	15.682	3.000	2823	0.835	24.57	578	1,768
	3	0.86	566	27.442	24.57	0.316	21.286	3.000	3831	0.643	24.57	566	2,475
Leach Stack	1	086	590	27.117	24.59	0.140	9.682	4.909	2,852	0.814	24.59	590	1,708
	2	086	596	27.352	24.59	0.110	7.575	4909	2,231	0.835	24.59	590	1,370
	3	0.86	590	27.094	24.59	0.114	7.887	4.909	2,323	0.812	24.59	590	1,388
Aerofall Stack # 1	1	086	590	27.878	24.71	1.026	69.810	2.182	9,140	0.882	24.71	590	5,959
	2	0.86	591	27.856	24.71	1.052	71.668	2.182	9,383	0.880	24.71	591	6,093
	3	0.86	590	27.632	24.71	1.020	69.710	2.182	9,126	0.860	24.71	590	5,802
Aerofall # 2	1	086	588	27.912	24.62	1.075	73.109	2.182	9,571	0.885	24.62	588	6,260
	2	086	583	27.744	24.62	1.098	74.580	2.182	4,764	0.870	24.62	583	6,332
	3	0.86	583	27.565	24.62	1.034	70.460	2.182	9,225	.854	24.62	583	5,872
Aerofall #3	1	0.86	580	28.125	24.61	1.096	73763	2.182	9,657	0.904	24.61	580	6,538
	2	0.86	578	28.461	24.61	1.065	71.129	2.182	9,312	0.934	24.61	578	6,536
	3	0.86	583	27.901	24.61	1.075	72827	2.182	9,535	0.884	24.61	583	6,279
Aerofall #4	1	0.826	590	27.565	24.62	1.019	67.092	2.182	8,784	0.854	24.62	590	5,525
	2	0.826	590	28.013	24.62	1.015	66.292	2.182	8,679	0.894	24.62	590	5,715
	3	0.826	588	27.822	24.62	1.053	68.893	2.182	9,019	0.877	24.62	588	5,846

APPENDIX D

RESUMES - R. C. FOSTER
J. D. SMITH
P. L. CHU

ROBERT C. FOSTER

EDUCATION

Drexel Institute of Technology, M. S., Environmental Engineering, 1967
Drexel Institute of Technology, B. S., Civil Engineering, 1966
Vanderbilt University, postgraduate courses in Environmental Engineering, 1968

EXPERIENCE

NUS CORPORATION, 1978–Present
Turner, Collie, and Braden, Inc., 1977–1978
Catalytic, Inc., 1975–1977
E. I. du Pont de Nemours and Company, Inc., 1969–1975
New Jersey State Department of Health, 1968–1969

NUS — Responsible for the planning and execution of air pollution control projects. Activities include compiling, organizing and evaluating data; estimating project cost, front-end development engineering; developing process and mechanical flow diagrams and plot plans; preparing project reports and schedules; preparing engineering reports and manuals; planning and executing environmental impact assessments; preparing permit applications; and planning and supervising the execution of air pollution control programs.

Turner, Collie, and Braden, Inc. — As Manager, Air Services, was responsible for the planning and execution of stack sampling programs and air pollution control engineering for utility and industrial clients. Types of industries serviced included petroleum, petrochemical, chemical, pulp and paper, plywood manufacturing, utilities, and cement.

Catalytic, Inc. — Lead engineer on EPA and environmental assessment work. Responsible for gathering and interpreting data, design and execution of sampling programs, recommending courses of action and preparing reports. Assignments included environmental and economic assessment of processes to convert residual oils into an environmentally sound fuel (such as hydrodesulfurization, partial oxidation and flue gas scrubbing), environmental evaluations and conceptual designs for coal gasification and liquefaction processes, and the conceptual design for an onsite process for coal desulfurization.

E. I. du Pont — Manager, Air Quality Management Services. Involved in stack sampling ambient monitoring, dispersion modeling, air pollution control engineering, and general environmental consulting. Types of industries served included petroleum, petrochemical, chemical, synthetic-fibers, utilities, metals, glass, and paint production.

Stack sampling experience ranged from determination of organic emission rates from small process vents to determination of particulates sulfur dioxide (SO_2) and oxides of nitrogen (NO_x) from large diameter utility stacks. Ambient experience ranged from a simple, single fixed-station SO_2 program to a ten-station SO_2, hydrocarbons, NO_x, particulates and chlorine program. Trained and supervised personnel and participated in sampling and monitoring programs. Air pollution control engineering experience included scrubbers, precipitators, baghouses, and organic fume abatement systems.

As an environmental consultant assisted plant and corporate staff personnel in the preparation of permits, impact statements, and the design and execution of required stack and ambient measurement programs.

New Jersey State Department of Health — Supervised the evaluation and planning section of the Bureau of Air Pollution Control. Work included the review and analysis of air monitoring data collected from the state's 21 monitoring stations, a continual evaluation of the effectiveness of state regulations in reducing ambient air concentrations, and the development of a statewide emission inventory.

MEMBERSHIP

Air Pollution Control Association

Jimmie D. Smith

Air Services Supervisor

Education

1970 – Bachelor of Science, Biology – Delta State University;

1973 – Master of Combined Sciences, Biology – University of Mississippi;

1975 – Post Master's Work, Environmental Engineering – Mississippi State University

Duties and Activities

Responsible for the supervision of personnel, equipment maintenance, analytical methods development, procurement of equipment and supplies involved in stack, ambient air, and industrial hygiene sampling. Activities include performing the requisite quality control checks, data review, and calculations to ensure the acceptable performance of field tests. Confers with regulatory agency observers to assure collection and reporting of required test data. Performs analysis of collected samples.

Experience

Prior to joining the firm, Mr. Smith worked four years in the Environmental Control Department of Mississippi Chemical Corporation. His experience while with the chemical company included both air and water quality work. His air work included ambient air analysis and monitoring for particulates, ammonium nitrate, urea and nitrites from fixed air stations. He acquired in-depth hands-on experience in source and dynamic sampling while performing efficiency tests on Beco, Buel and other wet scrubbers; NO_x sampling off nitric acid units; sampling exhaust gases off urea and ammonium nitrate prill towers, evaporators, neutralizers, cooler, dryer and pre-dryer stacks. This experience also included calibration of involved analyzers and performance of all of the standard gas analyses. In addition to the air work, Mr. Smith monitored and performed all the standard wastewater analysis from eleven water stations.

Since joining the firm, Mr. Smith has planned and executed numerous stack sampling assignments for both EPA New Source testing and Texas Air Control Board Compliance Sampling.

PHILIP SHIU-LUN CHU

ASSOCIATE ENVIRONMENTAL ENGINEER

EDUCATION

University of Houston, B.S., Biology, 1973
University of Houston, M.S., Biology, 1976
University of Houston, M.S., Environmental Engineering, 1979

EXPERIENCE

NUS Corporation, 1979-Present
Lone Star Industries, Inc., 1979

NUS CORPORATION - As associate environmental engineer, responsibilities include directing field source testing programs, scheduling of personnel and equipment and job preparation. Participate in and supervise sampling programs, data reduction, and equipment calibration and maintenance.

LONE STAR INDUSTRIES, INC. - As environmental control engineer, participated in the monitoring of particulate and SO_x emissions in several Lone Star cement plants using both State and EPA Guidelines; involved in testing velocity profiles in different positions of a newly installed coal-firing rotary kiln and resulted in optimizing the performance of such kiln.

PUBLICATIONS

Henry R. Henney and Philip Chu, "Differentiation of Physarum flavicomum: Metabolic Patterns and Role of Amino Acids in the Control of Encystment." Exp. Mucology, 1, p.41 (1977)

Henry R. Henney and Philip Chu, "Chemical Analyses of Cell Walls from Microcysts and Microsclerotia of Physarum flavicomum; Comparison to Slime Coat from Microplasmodia." Exp. Mycology, 1, p. 83 (1977)

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CORPORATION