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COMPANY : BECHTEL PETROLEUM OPERATIONS, INC.
UNIT : K-36 LTS-1
DATE : 2-5-92
REPORT : 10-849A

CARB METHOD 410A RESULTS
B, T, X, E, & PROPYLENE

		STACK SAMPLE AVERAGE	
COMPOUND	Field Blank ug/CM	ug/CM	lbs/hr
Benzene	2.01	106	6.7E-03
Ethylbenzene	2.51	51.1	3.2E-03
Toluene	41.3	169	1.1E-02
Xylenes, Total	14.1	421	2.6E-02
Propylene	22.8	3623	2.3E-01

COMPANY : BECHTEL PETROLEUM OPERATIONS, INC.
UNIT : K-36 LTS-1
DATE : 2-4-92
REPORT : 10-849A

CARB METHOD 422.102 RESULTS

1,3-BUTADIENE

			STACK SAMPLE AVERAGE		
	Blank	Bias Spike	EMISSIONS		
POLLUTANT	ppb	% Recovery	ppb	ug/CM	lbs/hr
1,3-Butadiene	9	88	75	166	1.1E-02

COMPANY : BECHTEL PETROLEUM OPERATIONS, INC.
UNIT : K-36 LTS-1
DATE : 2-3/5-92
REPORT : 10-849A

SUMMARY OF RESULTS

METHOD 429
(AVERAGE OF 3 RUNS)

		STACK SAMPLE AVERAGE				
Emittent	Field Blank ng	TOTAL ng	TOTAL ug	ug/DSCM	ppb	lb/hr
Naphthalene	3400	39333	39.3	1.5E+01	2.8E+00	9.3E-04
Acenaphthylene	36	643	0.64	2.4E-01	3.9E-02	1.6E-05
Acenaphthene	80	273	0.27	1.0E-01	1.6E-02	6.5E-06
Fluorene	100	760	0.76	2.9E-01	4.3E-02	1.9E-05
Phenanthrene	220	3433	3.43	1.3E+00	1.7E-01	8.1E-05
Anthracene	17	210	0.21	7.8E-02	1.1E-02	5.0E-06
Fluoranthene	33	593	0.59	2.2E-01	2.7E-02	1.4E-05
Pyrene	**5	363	0.36	1.4E-01	1.6E-02	8.7E-06
Benz (a) anthracene	**5	43	0.043	1.6E-02	1.7E-03	1.0E-06
Chrysene *1	**5	16	0.016	6.0E-03	6.5E-04	3.9E-07
Benzo(b) fluoranthene	**5	75	0.075	2.9E-02	2.8E-03	1.8E-06
Benzo(k) fluoranthene *1	**5	11	0.011	4.1E-03	3.9E-04	2.6E-07
Benzo(a)pyrene *1,2,3	**5	5	0.005	1.9E-03	1.8E-04	1.2E-07
Indeno(1,2,3-cd) pyrene	**5	13	0.013	4.7E-03	4.2E-04	3.0E-07
Dibenzo(a,h) anthracene *1,2,3	**5	5	0.005	1.9E-03	1.6E-04	1.2E-07
Benzo(g,h,i) perylene	**5	17	0.017	6.5E-03	5.8E-04	4.2E-07
				TOTAL	3.1E+00	1.1E-03

* Not detected in run(s) stated, used 1/2 detection limit
** Not detected in blank, used 1/2 detection limit

COMPANY : BECHTEL PETROLEUM OPERATIONS, INC.
UNIT : K-36 LTS-1
DATE : 2-4-92
REPORT : 10-849A

CARB METHOD 430 RESULTS
FORMALDEHYDE, ACETALDEHYDE, & ACROLEIN

COMPOUND	Field Blank Total ug	STACK SAMPLE AVERAGE Total ug	ug/CM	lbs/hr
Formaldehyde	6 **3	326	7136	4.6E-01
Acetaldehyde *1	0.79 **1,2,3	25	539	3.5E-02
Acrolein *1,2	2.5 **3	2	47	3.0E-03

* Not detected in runs stated, used 1/2 detection limit.

** Not detected in field blank in runs stated, used 1/2 detection limit.

INTRODUCTION

Facility Description:

Bechtel Petroleum Operations, Inc. operates the Naval Petroleum Reserve #1 (NPR1) for the Department of Energy (DOE) and Chevron, U.S.A. (CUSA) at Elk Hills, California. The field comprises 75 square miles and is the largest producer of natural gas in California. The facility produces light crude oil and related natural gas products for sale.

Process Description:

NPR1 utilizes internal combustion engines for various functions in gas/petroleum processing at Elk Hills, including transport to and from the gas plants, pressure maintenance of the reservoir, pressure maintenance of gas plants, vapor recovery, and various other functions necessary for the operation of a producing oil field.

Source Description:

Four typical internal combustion engines were selected for the AB2588 test program. The sources are typical natural gas fired internal combustion engines utilized at Elk Hills.

Engine & Location	HP	Model # & Configuration	APCD #
K-27 17R	650	L7042GU Naturally aspirated w/ catalytic convertor	4091058 C
K-36 LTS-1	5500	616KVR Turbocharged w/precombustion chamber (PCC)	4091023 B
K-49 17R	1000	L7042GSI Turbocharged w/prestratified charge (PSC)	4091031 B
K-70 30R	1500	-NA- Turbocharged w/precombustion chamber (PCC)	4091082 A

This report contains the data and results of all testing performed on engine K-36.

INTRODUCTION
(con't)

On February 3, 4, and 5, 1992, a series of source tests were conducted by Petro Chem Environmental Services, Inc. for Bechtel Petroleum Operations, Inc. on behalf of the Department of Energy (DOE) and Chevron, U.S.A., (CUSA). The purpose of the test was to document emissions for AB2588. The test unit was one internal combustion engine: K-36. Concentrations (ug/CM) and emissions (lbs/hr) of various organic compounds from the exhaust of the test units were determined using the following methods.

Parameters	Method	# Test Runs	Analytical Lab
B,T,X,E & Propylene	A	3 + Blank	Coast to Coast Analytical
Formaldehyde, Acetaldehyde, & Acrolein	B	3 + 3 Blanks + spike	Coast to Coast Analytical
PAH Total and speciated	C	3 + Blank + 3 spikes	Alta Analytical Laboratory, Inc.
1,3-Butadiene	D	3 + Blank + spike	Petro Chem Environmental Services, Inc.

Methods	
A. B, T, X, E, & Propylene	CARB Method 410A: Bag Sample with condensate trap. Bag analysis by EPA Method T014 GCMS. Condensate analysis by EPA Method 8260 GCMS.
B. Formaldehyde, Acetaldehyde, & Acrolein	CARB Method 430: DNPH impingement analysis by HPLC.
C. PAH	CARB Method 429: Analysis by high resolution GCMS.
D. 1,3-Butadiene	CARB Method 422.102: On site analysis by GC/PID. CARB Method 422.199: Quality assurance

All testing and sampling was performed by various PCES technicians under the supervision of Mark Ready of PCES. All source testing was carried out according to the test schedule (Table 1). Terry Rowles of PCES performed and supervised all 1,3-Butadiene testing. Mike Carr of Bechtel Petroleum Operations, Inc. supervised the operation of the test unit. Frank Ripepi of KCAPCD reviewed all of the testing procedures and observed some of the testing.

TABLE 1:
AB2588 TEST SCHEDULE

RUN #-TEST DESCRIPTION	DATE	SAMPLE TIME FROM/TO	TEST UNIT #	SOURCE OWNER	CARB METHOD
1-PAH	2-04-92	1018-1325	K-36	BECHTEL	429
2-PAH	2-04-92	1425-1750	K-36	BECHTEL	429
1-1,3-Butadiene	2-04-92	1350	K-36	BECHTEL	422.102
2-1,3-Butadiene	2-04-92	1403	K-36	BECHTEL	422.102
3-1,3-Butadiene	2-04-92	1415	K-36	BECHTEL	422.102
3-PAH	2-05-92	940-1305	K-36	BECHTEL	429
1-B,T,X,E, & PROPYLENE	2-05-92	1010-1030	K-36	BECHTEL	410A
2-B,T,X,E, & PROPYLENE	2-05-92	1053-1113	K-36	BECHTEL	410A
3-B,T,X,E, & PROPYLENE	2-05-92	1120-1140	K-36	BECHTEL	410A
1-Form, Acet, Acr	2-05-92	1340-1520	K-36	BECHTEL	430
2-Form, Acet, Acr	2-05-92	1521-1701	K-36	BECHTEL	430
3-Form, Acet, Acr	2-05-92	1702-1842	K-36	BECHTEL	430

DISCUSSION

All data which is reported has not been corrected for blank analysis. The average amount of target compound stack sample has been reported and the average amount of target compound blank has been report in an adjacent column.

Where no target compound has been detected, one-half of the detection limit has been used to calculate emissions. That target compound has been asterisked and the run (or runs) which are non-detect are stated.

All testing prodeeded smoothly, without delays associated with either the test unit or the sampling equipment.

All samples were analysed within the required holding time stated in the method.

COMPANY : BECHTEL PETROLEUM OPERATIONS, INC.
UNIT : K-36 LTS-1
DATE : 2-5-92
REPORT : 10-849A

CARB METHOD 410A

SUMMARY OF RESULTS

LIGHT MOLECULAR WEIGHT HYDROCARBONS, GCMS

	TOTAL ug/CM			
COMPOUND	RUN #1	RUN #2	RUN #3	AVERAGE
Benzene	99.2	110	110	106
Ethylbenzene	34.1	57.1	62.1	51.1
Toluene	133	163	212	169
Xylenes, Total	271	470	521	421
Propylene	1922	2423	6523	3623

	LBS/HR			
COMPOUND	RUN #1	RUN #2	RUN #3	AVERAGE
Benzene	0.0062	0.0069	0.0069	0.0067
Ethylbenzene	0.0021	0.0036	0.0039	0.0032
Toluene	0.0083	0.0102	0.0133	0.0106
Xylenes, Total	0.0169	0.0294	0.0326	0.0263
Propylene	0.1202	0.1515	0.4077	0.2265

COMPANY : BECHTEL PETROLEUM OPERATIONS, INC.
UNIT : K-36 LTS-1
DATE : 2-5-92
REPORT : 10-849A

METHOD 410A
@ 60° F

RUN #:	1	2	3
TIME :	1010	1053	1120
Vm (dry gas sampled)	0.75	0.70	0.73
Y (meter calib. factor)	0.98517	0.98517	0.98517
P bar (Barometric pressure)	28.8	28.8	28.8
P static (stack pressure, " H2O)	-0.55	-0.55	-0.55
Delta H (differential meter press, " H2O)	0	0	0
Tm (meter temperature, R°)	541.6	540.4	540.4
Vm(std),dscf	**0.68**	**0.66**	**0.67**
Vm(std),dscm	**0.0193**	**0.0188**	**0.0189**

COMPANY : BECHTEL PETROLEUM OPERATIONS, INC.
UNIT : K-36 LTS-1
DATE : 2-5-92
REPORT : 10-849A

CARB METHOD 410A

Light Molecular Weight Hydrocarbons, GCMS

RUN #1

Compound	Non-Condensable ppb	Non-Condensable ug/CM	Condensable ug/L *	Condensable ug/CM	TOTAL ug/CM	TOTAL lbs/hr
Benzene	28	99	0.1	0.2228	99.2	0.0062
Ethylbenzene	7	34	** 0.05	0.111	34.1	0.0021
Toluene	32	130	1.4	3.12	133	0.0083
Xylenes, Total	57	270	0.5	1.11	271	0.0169
Propylene	1000	1900	** 10	22	1922	0.1202

Vm(std), DSCM	=	0.0193
DSCFM	=	16624

RUN #2

Compound	Non-Condensable ppb	Non-Condensable ug/CM	Condensable ug/L *	Condensable ug/CM	TOTAL ug/CM	TOTAL lbs/hr
Benzene	32	110	0.2	0.457	110	0.0069
Ethylbenzene	12	57	** 0.05	0.114	57.1	0.0036
Toluene	39	160	1.5	3.43	163	0.0102
Xylenes, Total	99	470	** 0.05	0.114	470	0.0294
Propylene	1300	2400	** 10	23	2423	0.1515

Vm(std), DSCM	=	0.0188
DSCFM	=	16624

RUN #3

Compound	Non-Condensable ppb	Non-Condensable ug/CM	Condensable ug/L *	Condensable ug/CM	TOTAL ug/CM	TOTAL lbs/hr
Benzene	32	110	** 0.05	0.114	110	0.0069
Ethylbenzene	13	62	** 0.05	0.114	62.1	0.0039
Toluene	51	210	1.0	2.28	212	0.0133
Xylenes, Total	110	520	0.5	1.14	521	0.0326
Propylene	3500	6500	** 10	23	6523	0.4077

Vm(std), DSCM	=	0.0189
DSCFM	=	16624

* ug/L of liquid sample

Calculations :

ug/CM (aqueous) = (ug/L * .043 Liter)/Vm(std),DSCM
lbs/hr = ug/CM * 2.205 * 10^-9 * .02832 CM/CF * 60 min/hr * DSCFM

** Not detected, used 1/2 detection limit

COMPANY : BECHTEL PETROLEUM OPERATIONS, INC.
UNIT : K-36 LTS-1
DATE : 2-5-92
REPORT : 10-849A

CARB METHOD 410A
FIELD BLANK
Light Molecular Weight Hydrocarbons, GCMS

Compound	Non-Condensable ppb	Non-Condensable ug/CM	Condensable ug/L *	Condensable ug/CM	TOTAL ug/CM
Benzene	0.5	1.9	** 0.05	0.113	2.01
Ethylbenzene	0.5	2.4	** 0.05	0.113	2.51
Toluene	9.5	39	1.0	2.26	41.3
Xylenes, Total	3	14	** 0.05	0.113	14.1
Propylene	** 0.1	0.172	** 10	22.6	22.8

AVERAGE
Vm(std), DSCM = 0.0190

** Not detected, used 1/2 detection limit

COAST TO COAST ANALYTICAL SERVICES

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(805) 543-2553
FAX (805) 543-2685

CLIENT: Terry Rowles
Petro Chem Enviromental
3207 Antonino Ave
Bakersfield, CA 93308

Lab Number : I-0515-1
Project : 10-849 Bechtel

Analyzed : 02/07/92
Analyzed by: CR
Method : EPA TO-14

REVISED
REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
K-36 LTS1 Non-Condensable #1	Air	Mark Ready	02/04/92	02/07/92

CONSTITUENT	*PQL ppbv	RESULT ppbv	RESULT µg/cu M	NOTE
FUEL FINGERPRINT in AIR				
Benzene	1.	28.	99.	
Toluene	1.	32.	130.	
Ethylbenzene	1.	7.	34.	
Xylenes	1.	57.	270.	
Ethylene Dichloride	1.	ND	ND	
Ethylene Dibromide	1.	ND	ND	
Propylene	2.	1000.	1900.	

Lab Certifications: CAELAP#1598, NYELAP#11177, UTELAP#E-142, A2LA#0136-01, L.A.Co.CSD#10187.
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

03/10/92
MSD1/1B61E
LRH/ge
IB07M1

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Gesheng Dai

Gesheng Dai, Ph.D., Group Leader

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Vice President
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Bakersfield, CA 93308

Lab Number : I-0515-2
Project : 10-849 Bechtel

Analyzed : 02/07/92
Analyzed by: CR
Method : EPA TO-14

REVISED
REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
K-36 LTS1 Non-Condensable #2	Air	Mark Ready	02/04/92	02/07/92

CONSTITUENT	*PQL ppbv	RESULT ppbv	RESULT µg/cu M	NOTE
FUEL FINGERPRINT in AIR				
Benzene	1.	32.	110.	
Toluene	1.	39.	160.	
Ethylbenzene	1.	12.	57.	
Xylenes	1.	99.	470.	
Ethylene Dichloride	1.	ND	ND	
Ethylene Dibromide	1.	ND	ND	
Propylene	2.	1300.	2400.	

Lab Certifications: CAELAP#1598, NYELAP#11177, UTELAP#E-142, A2LA#0136-01, L.A.Co.CSD#10187.
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

03/10/92
MSD1/1B58E
LRH/ge
IB07M1

Respectfully submitted,
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CLIENT: Terry Rowles
Petro Chem Enviromental
3207 Antonino Ave
Bakersfield, CA 93308

Lab Number : I-0515-3
Project : 10-849 Bechtel

Analyzed : 02/07/92
Analyzed by: CR
Method : EPA TO-14

REVISED
REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
K-36 LTS1 Non-Condensable #3	Air	Mark Ready	02/04/92	02/07/92

CONSTITUENT	*PQL ppbv	RESULT ppbv	RESULT µg/cu M	NOTE
FUEL FINGERPRINT in AIR				
Benzene	1.	32.	110.	
Toluene	1.	51.	210.	
Ethylbenzene	1.	13.	62.	
Xylenes	1.	110.	520.	
Ethylene Dichloride	1.	ND	ND	
Ethylene Dibromide	1.	ND	ND	
Propylene	2.	3500.	6500	

Lab Certifications: CAELAP#1598, NYELAP#11177, UTELAP#E-142, A2LA#0136-01, L.A.Co.CSD#10187.
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

03/10/92
MSD1/1B59E
LRH/ge

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Gesheng Dai

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Lab Number : I-0525-4
Project : 10-849 Bechtel

CLIENT: Terry Rowles
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3207 Antonino Ave
Bakersfield, CA 93308

Analyzed : 02/09/92
Analyzed by: EA
Method : EPA TO-14

R E V I S E D
REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
K36 + K-70 30R Noncondensable Blank	Air	Mark Ready	02/06/92	02/08/92

CONSTITUENT	*PQL ppbv	RESULT ppbv	RESULT µg/cu M	NOTE
FUEL FINGERPRINT in AIR				
Benzene	0.1	0.5	1.9	
Toluene	0.1	9.5	39.	
Ethylbenzene	0.1	0.5	2.4	
Xylenes	0.1	3.	14.	
Ethylene Dichloride	0.1	ND	ND	
Ethylene Dibromide	0.1	ND	ND	
Propylene	0.2	ND	ND	

Lab Certifications: CAELAP#1598, NYELAP#11177, UTELAP#E-142, A2LA#0136-01, L.A.Co.CSD#10187.
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

03/09/92
MSD1/1B83E
LRH/ge
IB09M1

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Gesheng Dai

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Lab Number : I-0525-9
Project : 10-849 Bechtel

Analyzed : 02/18/92
Analyzed by: DZ
Method : EPA 8260

R E V I S E D
REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
K-36 LTS-1 Condensable #1	Aqueous	Mark Ready	02/05/92	02/08/92

CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE
PRIORITY POLLUTANT VOLATILE ORGANICS				1
Benzene	(71432)	0.1	0.1	
Ethylbenzene	(100411)	0.1	ND	
Toluene	(108883)	0.2	1.4	
Xylenes, Total		0.1	0.5	
1,2-Dichloroethane-d4 (% Surrogate Recovery)			100.	
p-Bromofluorobenzene (% Surrogate Recovery)			100.	
Propylene		20.	ND	

Lab Certifications: CAELAP#1598, NYELAP#11177, UTELAP#E-142, A2LA#0136-01, L.A.Co.CSD#10187.
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)
(1) EXTRACTED by EPA 5030 (purge-and-trap)

03/09/92
MSD2/2R05-09C
MH/bpl/aea/cmo
IB182WVP

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Mary Havlicek, Ph.D.
President

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CLIENT: Terry Rowles
Petro Chem Enviromental
3207 Antonino Ave
Bakersfield, CA 93308

Lab Number : I-0525-10
Project : 10-849 Bechtel

Analyzed : 02/18/92
Analyzed by: DZ
Method : EPA 8260

REVISED
REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
K-36 LTS-1 Condensable #2	Aqueous	Mark Ready	02/05/92	02/08/92

CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE
PRIORITY POLLUTANT VOLATILE ORGANICS				1
Benzene	(71432)	0.1	0.2	
Ethylbenzene	(100411)	0.1	ND	
Toluene	(108883)	0.2	1.5	
Xylenes, Total		0.1	ND	
1,2-Dichloroethane-d4 (% Surrogate Recovery)			100.	
p-Bromofluorobenzene (% Surrogate Recovery)			97.	
Propylene		20.	ND	

Lab Certifications: CAELAP#1598, NYELAP#11177, UTELAP#E-142, A2LA#0136-01, L.A.Co.CSD#10187.
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)
(1) EXTRACTED by EPA 5030 (purge-and-trap)

03/09/92
MSD2/2R06-10C
MH/bpl/aea/cmo
IB182WVP

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Mary Havlicek, Ph.D.
President

COAST TO COAST ANALYTICAL SERVICES

Air, Water & Hazardous Waste Sampling, Analysis & Consultation
Certified Hazardous Waste, Chemistry, Bacteriology & Bioassay Laboratories

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San Luis Obispo Division
141 Suburban Road, San Luis Obispo, California 93401
(805) 543-2553
FAX (805) 543-2685

CLIENT: Terry Rowles
Petro Chem Enviromental
3207 Antonino Ave
Bakersfield, CA 93308

Lab Number : I-0525-11
Project : 10-849 Bechtel

Analyzed : 02/18/92
Analyzed by: DZ
Method : EPA 8260

REVISED
REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
K-36 LTS-1 Condensable #3	Aqueous	Mark Ready	02/05/92	02/08/92

CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE
PRIORITY POLLUTANT VOLATILE ORGANICS				1
Benzene	(71432)	0.1	ND	
Ethylbenzene	(100411)	0.1	ND	
Toluene	(108883)	0.2	1.0	
Xylenes, Total		0.1	0.5	
1,2-Dichloroethane-d4 (% Surrogate Recovery)			100.	
p-Bromofluorobenzene (% Surrogate Recovery)			99.	
Propylene		20.	ND	

Lab Certifications: CAELAP#1598, NYELAP#11177, UTELAP#E-142, A2LA#0136-01, L.A.Co.CSD#10187.
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)
(1) EXTRACTED by EPA 5030 (purge-and-trap)

03/09/92
MSD2/2R07-11C
MH/bpl/aea/cmo
IB182WVP

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Mary Havlicek, Ph.D.
President

COAST-TO-COAST ANALYTICAL SERVICES

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141 Suburban Road, San Luis Obispo, California 93401 FAX (805) 543-2685

CLIENT: Terry Rowles
Petro Chem Environmental
3207 Antonino Ave
Bakersfield, CA 93308

Lab Number : I-0525-8
Project : 10-849 Bechtel

Analyzed : 02/18/92
Analyzed by: DZ
Method : EPA 8260

REVISED
REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
K26-4				
K-70 30R Condensable Blank	Aqueous	Mark Ready	02/06/92	02/08/92

CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE
PRIORITY POLLUTANT VOLATILE ORGANICS				1
Benzene	(71432)	0.1	ND	
Ethylbenzene	(100411)	0.1	ND	
Toluene	(108883)	0.2	1.0	
Xylenes, Total		0.1	ND	
1,2-Dichloroethane-d4 (% Surrogate Recovery)			100.	
p-Bromofluorobenzene (% Surrogate Recovery)			98.	
Propylene		20.	ND	

Lab Certifications: CAELAP#1598, NYELAP#11177, UTELAP#E-142, A2LA#0136-01, L.A.Co.CSD#10187.
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)
(1) EXTRACTED by EPA 5030 (purge-and-trap)

03/09/92
MSD2/2R04C
MH/bpl/aea/cmo
IB182WVP

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Mary Havlicek, Ph.D.
President

COAST - TO - COAST ANALYTICAL SERVICES

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QC Batch ID: IB212WV

CLIENT: Coast-to-Coast Analytical Services, Inc.

Analyzed : 02/21/92
Analyzed by: RF
Method : EPA 8260

METHOD BLANK
REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
METHOD BLANK	Aqueous			

CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE
PRIORITY POLLUTANT VOLATILE ORGANICS				1
Benzene	(71432)	0.1	ND	
Bromochloromethane	(74975)	0.1	ND	
Bromodichloromethane	(75274)	0.1	ND	
Bromoform	(75252)	0.2	ND	
Bromomethane (Methyl Bromide)	(74839)	0.1	ND	
Carbon Tetrachloride	(56235)	0.1	ND	
Chlorobenzene	(108907)	0.1	ND	
Chloroethane (Ethyl Chloride)	(75003)	0.1	ND	
Chloromethane (Methyl Chloride)	(74873)	0.1	ND	
2-Chloroethyl Vinyl Ether	(110758)	1.	ND	
Chloroform	(67663)	0.5	ND	
Dibromochloromethane	(124381)	0.1	ND	
1,2-Dichlorobenzene	(95501)	0.1	ND	
1,3-Dichlorobenzene	(541731)	0.1	ND	
1,4-Dichlorobenzene	(106467)	0.1	ND	
Dichlorodifluoromethane	(75718)	1.	ND	
1,1-Dichloroethane	(75343)	0.1	ND	
1,2-Dichloroethane (EDC)	(107062)	0.1	ND	
1,1-Dichloroethene	(75354)	0.1	ND	
cis-1,2-Dichloroethene	(156694)	0.1	ND	
trans-1,2-Dichloroethene	(156605)	0.1	ND	

Lab Certifications: CAELAP#1598, NYELAP#11177, UTELAP#E-142, A2LA#0136-01.
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)
(1) EXTRACTED by EPA 5030 (purge-and-trap)

02/27/92
MSD2/2R47C
MH/bpl/cmo/dez
I0611-1

COAST · TO · COAST ANALYTICAL SERVICES

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Certified Hazardous Waste, Chemistry, Bacteriology & Bioassay Laboratories

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QC Batch ID: IB212WV

CLIENT: Coast-to-Coast Analytical Services, Inc.

Analyzed : 02/21/92
Analyzed by: RF
Method : EPA 8260

METHOD BLANK
REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	DATE RECEIVED
METHOD BLANK	Aqueous			

CONSTITUENT	(CAS RN)	*PQL µg/L	RESULT µg/L	NOTE
1,2-Dichloropropane	(78875)	0.1	ND	
cis-1,3-Dichloropropene	(10061015)	0.1	ND	
trans-1,3-Dichloropropene	(10061026)	0.1	ND	
Dichlorotrifluoroethane	(306832)	0.1	ND	
Ethylbenzene	(100411)	0.1	ND	
Methylene Chloride	(75092)	1.	ND	
1,1,2,2-Tetrachloroethane	(79345)	0.5	ND	
Tetrachloroethene (PCE)	(127184)	0.1	ND	
1,1,1-Trichloroethane (TCA)	(71556)	0.1	ND	
1,1,2-Trichloroethane	(79005)	0.1	ND	
Trichloroethene (TCE)	(79016)	0.1	ND	
Trichlorotrifluoroethane (F-113)	(76131)	0.5	ND	
Trichlorofluoromethane (F-11)	(75694)	0.5	ND	
Toluene	(108883)	0.2	ND	
Vinyl Chloride	(75014)	0.1	ND	
Xylenes, Total		0.1	ND	
1,2-Dichloroethane-d4 (% Surrogate Recovery)			97.	
Toluene-d8 (% Surrogate Recovery)			107.	
p-Bromofluorobenzene (% Surrogate Recovery)			100.	
Propylene		20.	ND	

Lab Certifications: CAELAP#1598, NYELAP#11177, UTELAP#E-142, A2LA#0136-01.
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

02/27/92
MSD2/2R47C
MH/bpl/cmo/dez
I0611-1

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Mary Havlicek, Ph.D.
President

COAST TO COAST ANALYTICAL SERVICES

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QC Batch ID: IB212WV

CLIENT: Coast-to-Coast Analytical Services, Inc.

Analyzed : 02/21/92
Analyzed by: RF
Method : EPA 8260

QC SPIKE
REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
QC SPIKE	Aqueous			

CONSTITUENT	*PQL µg/L	SPIKE AMOUNT	RESULT µg/L	%REC	NOTE
PRIORITY POLLUTANT VOLATILE ORGANICS					1,2
Benzene	0.1	10.	12.	120.	
Bromochloromethane	0.1	10.	11.	110.	
Bromodichloromethane	0.1	10.	11.	110.	
Bromoform	0.2	10.	8.4	84.	
Bromomethane (Methyl Bromide)	0.1	10.	12.	120.	
Carbon Tetrachloride	0.1	10.	13.	130.	
Chlorobenzene	0.1	10.	13.	130.	
Chloroethane (Ethyl Chloride)	0.1	10.	12.	120.	
Chloromethane (Methyl Chloride)	0.1	10.	11.	110.	
2-Chloroethyl Vinyl Ether	1.		NS		
Chloroform	0.5	10.	11.	110.	
Dibromochloromethane	0.1	10.	11.	110.	
1,2-Dichlorobenzene	0.1	10.	11.	110.	
1,3-Dichlorobenzene	0.1	10.	12.	120.	
1,4-Dichlorobenzene	0.1	10.	12.	120.	
Dichlorodifluoromethane	1.	10.	10.	100.	
1,1-Dichloroethane	0.1	10.	11.	110.	
1,2-Dichloroethane (EDC)	0.1	10.	6.8	68.	
1,1-Dichloroethene	0.1	10.	11.	110.	
cis-1,2-Dichloroethene	0.1	10.	11.	110.	

Lab Certifications: CAELAP#1598, NYELAP#11177, UTELAP#E-142, A2LA#0136-01.
* RESULTS listed as 'NS' were not spiked. PQL = Practical Quantitation Limit
(1) EXTRACTED by EPA 5030 (purge-and-trap)
(2) Spike was in analyte-free water.

02/27/92
MSD2/2R41C
MH/bpl/cmo/dez
I0611-1

COAST - TO - COAST ANALYTICAL SERVICES

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QC Batch ID: IB212WV

CLIENT: Coast-to-Coast Analytical Services, Inc.

Analyzed : 02/21/92
Analyzed by: RF
Method : EPA 8260

QC SPIKE
REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	DATE RECEIVED
QC SPIKE	Aqueous			

CONSTITUENT	*PQL µg/L	SPIKE AMOUNT	RESULT µg/L	%REC	NOTE
trans-1,2-Dichloroethene	0.1	10.	11.	110.	
1,2-Dichloropropane	0.1	10.	11.	110.	
cis-1,3-Dichloropropene	0.1	10.	10.	100.	
trans-1,3-Dichloropropene	0.1	10.	10.	100.	
Dichlorotrifluoroethane	0.1		NS		
Ethylbenzene	0.1	10.	12.	120.	
Methylene Chloride	1.	10.	11.	110.	
1,1,2,2-Tetrachloroethane	0.5	10.	10.	100.	
Tetrachloroethene (PCE)	0.1	10.	12.	120.	
1,1,1-Trichloroethane (TCA)	0.1	10.	10.	100.	
1,1,2-Trichloroethane	0.1	10.	11.	110.	
Trichloroethene (TCE)	0.1	10.	13.	130.	
Trichlorotrifluoroethane (F-113)	0.5	10.	12.	120.	
Trichlorofluoromethane (F-11)	0.5	10.	11.	110.	
Toluene	0.2	10.	12.	120.	
Vinyl Chloride	0.1	10.	12.	120.	
Xylenes, Total	0.1	10.	12.	120.	
1,2-Dichloroethane-d4 (% Surrogate Recovery)			107.	NS	
Toluene-d8 (% Surrogate Recovery)			104.	NS	
p-Bromofluorobenzene (% Surrogate Recovery)			102.	NS	
Propylene	20.		NS		

Lab Certifications: CAELAP#1598, NYELAP#11177, UTELAP#E-142, A2LA#0136-01.
* RESULTS listed as 'NS' were not spiked. PQL = Practical Quantitation Limit

02/27/92
MSD2/2R41C
MH/bpl/cmo/dez
I0611-1

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Mary Havlicek, Ph.D.
President

Petro Chem Environmental Services, Inc.

COAST TO-COAST ANALYTICAL SERVICES

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(805) 543-2553
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QC Batch ID: IB212WV

CLIENT: Coast-to-Coast Analytical Services, Inc.

Analyzed : 02/21/92
Analyzed by: RF
Method : EPA 8260

QC SPIKE
REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	DATE RECEIVED
QC SPIKE DUPLICATE	Aqueous			

CONSTITUENT	*PQL µg/L	SPIKE AMOUNT	RESULT µg/L	%REC	%DIFF	NOTE
PRIORITY POLLUTANT VOLATILE ORGANICS						1,2
Benzene	0.1	10.	12.	120.	0.	
Bromochloromethane	0.1	10.	12.	120.	8.7	
Bromodichloromethane	0.1	10.	12.	120.	8.7	
Bromoform	0.2	10.	9.4	94.	11.	
Bromomethane (Methyl Bromide)	0.1	10.	12.	120.	0.	
Carbon Tetrachloride	0.1	10.	13.	130.	0.	
Chlorobenzene	0.1	10.	13.	130.	0.	
Chloroethane (Ethyl Chloride)	0.1	10.	12.	120.	0.	
Chloromethane (Methyl Chloride)	0.1	10.	11.	110.	0.	
2-Chloroethyl Vinyl Ether	1.		NS			
Chloroform	0.5	10.	12.	120.	8.7	
Dibromochloromethane	0.1	10.	12.	120.	8.7	
1,2-Dichlorobenzene	0.1	10.	11.	110.	0.	
1,3-Dichlorobenzene	0.1	10.	12.	120.	0.	
1,4-Dichlorobenzene	0.1	10.	12.	120.	0.	
Dichlorodifluoromethane	1.	10.	12.	120.	18.	
1,1-Dichloroethane	0.1	10.	11.	110.	0.	
1,2-Dichloroethane (EDC)	0.1	10.	7.8	78.	14.	
1,1-Dichloroethene	0.1	10.	12.	120.	8.7	
cis-1,2-Dichloroethene	0.1	10.	12.	120.	8.7	

Lab Certifications: CAELAP#1598, NYELAP#11177, UTELAP#E-142, A2LA#0136-01.
* RESULTS listed as 'NS' were not spiked. PQL = Practical Quantitation Limit
(1) EXTRACTED by EPA 5030 (purge-and-trap)
(2) Spike was in analyte-free water.

02/27/92
MSD2/2R45C
MH/bpl/cmo/dez
I0611-1

Petro Chem Environmental Services, Inc.

COAST - TO - COAST ANALYTICAL SERVICES

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QC Batch ID: IB212WV

CLIENT: Coast-to-Coast Analytical Services, Inc.

Analyzed : 02/21/92
Analyzed by: RF
Method : EPA 8260

QC SPIKE
REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
QC SPIKE DUPLICATE	Aqueous			

CONSTITUENT	*PQL µg/L	SPIKE AMOUNT	RESULT µg/L	%REC	%DIFF	NOTE
trans-1,2-Dichloroethene	0.1	10.	12.	120.	8.7	
1,2-Dichloropropane	0.1	10.	12.	120.	8.7	
cis-1,3-Dichloropropene	0.1	10.	12.	120.	18.	
trans-1,3-Dichloropropene	0.1	10.	13.	130.	26.	
Dichlorotrifluoroethane	0.1		NS			
Ethylbenzene	0.1	10.	12.	120.	0.	
Methylene Chloride	1.	10.	11.	110.	0.	
1,1,2,2-Tetrachloroethane	0.5	10.	11.	110.	9.5	
Tetrachloroethene (PCE)	0.1	10.	13.	130.	8.	
1,1,1-Trichloroethane (TCA)	0.1	10.	12.	120.	18.	
1,1,2-Trichloroethane	0.1	10.	12.	120.	8.7	
Trichloroethene (TCE)	0.1	10.	13.	130.	0.	
Trichlorotrifluoroethane (F-113)	0.5	10.	13.	130.	8.	
Trichlorofluoromethane (F-11)	0.5	10.	12.	120.	8.7	
Toluene	0.2	10.	12.	120.	0.	
Vinyl Chloride	0.1	10.	13.	130.	8.	
Xylenes, Total	0.1	10.	11.	110.	8.7	
1,2-Dichloroethane-d4 (% Surrogate Recovery)			112.	NS		
Toluene-d8 (% Surrogate Recovery)			101.	NS		
p-Bromofluorobenzene (% Surrogate Recovery)			95.	NS		
Propylene	20.		NS			

Lab Certifications: CAELAP#1598, NYELAP#11177, UTELAP#E-142, A2LA#0136-01.
* RESULTS listed as 'NS' were not spiked. PQL = Practical Quantitation Limit

02/27/92
MSD2/2R45C
MH/bpl/cmo/dez
I0611-1

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Mary Havlicek, Ph.D.
President

Petro Chem Environmental Services, Inc.

COAST - TO - COAST ANALYTICAL SERVICES

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QC Batch ID: IB14M1

CLIENT: Coast-to-Coast Analytical Services, Inc.

Analyzed : 02/14/92
Analyzed by: GD
Method : EPA TO-14

QC SPIKE
REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
QC SPIKE	Air			

CONSTITUENT	*PQL µg/cu M	SPIKE AMOUNT	RESULT µg/cu M	%REC	NOTE
FUEL FINGERPRINT in AIR					1
Benzene	0.5	17.	17.	100.	
Toluene	0.5	20.	17.	85.	
Ethylbenzene	0.5	22.	22.	100.	
Xylenes	0.5	24.	23.	96.	
Ethylene Dichloride	0.5	22.	25.	114.	
Ethylene Dibromide	1.	40.	41.	103.	

Lab Certifications: CAELAP#1598, NYELAP#11177, UTELAP#E-142, A2LA#0136-01.
* RESULTS listed as 'NS' were not spiked. PQL = Practical Quantitation Limit
(1) Zero Air spiked with NIST SRM 1804, Cylinder # ALM-000881.

02/18/92
MSD1/1C68E
LRH/ge
I0611-5

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Gesheng Dai

Gesheng Dai, Ph.D., Group Leader

Laurence R. Hilpert, Ph.D.
Vice President

COAST TO COAST ANALYTICAL SERVICES

Air, Water & Hazardous Waste Sampling, Analysis & Consultation
Certified Hazardous Waste, Chemistry, Bacteriology & Bioassay Laboratories

San Luis Obispo, CA • Goleta, CA • Benicia, CA • Camarillo, CA • Newport Beach, CA • Valparaiso, IN

San Luis Obispo Division (805) 543-2553
141 Suburban Road, San Luis Obispo, California 93401 FAX (805) 543-2685

QC Batch ID: IB14M1

CLIENT: Coast-to-Coast Analytical Services, Inc.

Analyzed : 02/14/92
Analyzed by: CR
Method : EPA TO-14

INSTRUMENT BLANK
REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED DATE	RECEIVED
INSTRUMENT BLANK	Air			

CONSTITUENT	(CAS RN)	*PQL µg/cu M	RESULT µg/cu M	NOTE
FUEL FINGERPRINT in AIR				
Benzene	(71432)	0.5	ND	
Toluene	(108883)	0.5	ND	
Ethylbenzene	(100411)	0.5	ND	
Xylenes		0.5	ND	
Ethylene Dichloride	(107062)	0.5	ND	
Ethylene Dibromide	(106934)	1.	ND	

Lab Certifications: CAELAP#1598, NYELAP#11177, UTELAP#E-142, A2LA#0136-01.
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

02/18/92
MSD1/1C52E
LRH/ge
I0611-5

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Gesheng Dai

Gesheng Dai, Ph.D., Group Leader

Laurence R. Hilpert, Ph.D.
Vice President

COMPANY : BECHTEL PETROLEUM OPERATIONS, INC.
UNIT : K-36 LTS-1
DATE : 2-04-92
REPORT : 10-849A

CARB METHOD 422.102
1,3-BUTADIENE RESULTS

TEST	#1	#2	#3	
TIME	1350	1403	1415	AVERAGE
ppb	65	82	78	75
ug/CM	144	181	173	166
lbs/hr	0.009	0.012	0.011	0.011

DSCFM = 16624 (AVERAGE OF METHOD 429 TRAVERSE)

EQUATIONS:
ug/CM = ppb * MW/24.41
lbs/hr = ppb * 1.581 * 10 ^-10 * MW * DSCFM

MW = 54

COMPANY : BECHTEL PETROLEUM
UNIT : K-36
DATE : 2-04-92
REPORT : 10-849A

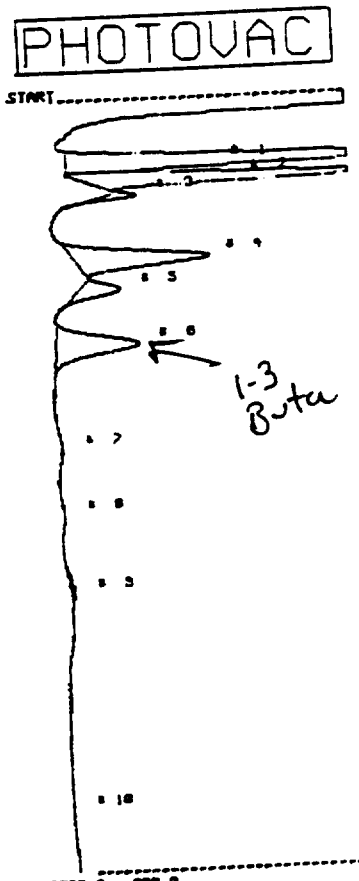
ANALYSIS REPORT

METHOD 422.102
1, 3-BUTADIENE

RESULTS

	RUN # 1	RUN # 2	RUN # 3	AVERAGE
TIME	13:50	14:03	14:15	
AREA COUNTS (mVS)	3000	3900	3700	3533
ppbv 1, 3-BUTADIENE	65	82	78	75

Petro Chem Environmental Services, Inc.

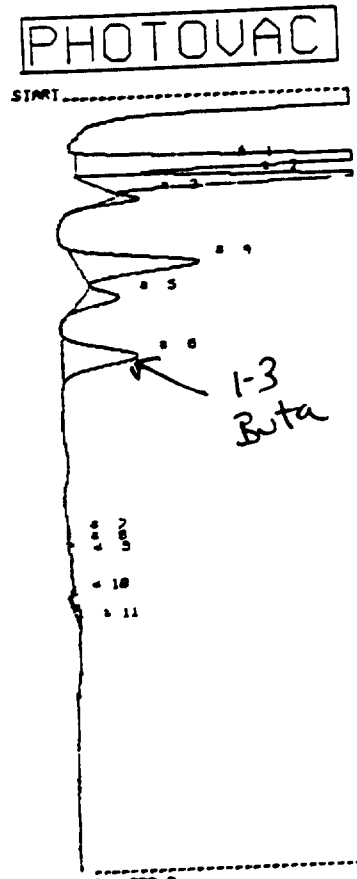


STOP @ 600.0
SAMPLE LIBRARY 1 FEB 4 1992 14: 3
ANALYSIS # 18 BECHTEL
INTERNAL TEMP 33 BUTADIENE
GAIN 100 SAMPLE RUN

OFFSET	3.0 mV	
CHART SPEED	1	cM/Min
SLOPE SENS.	10 10	2 mV/Sec
WINDOW +/-	5	Percent
MINIMUM AREA	100	mVSec
TIMER DELAY	40.0	Sec
ANALYSIS TIME	600.0	Sec
CYCLE TIME	0	Min

COMPOUND NAME	PEAK	R.T.	AREA/PPM	
UNKNOWN	1	49.1	12.7	US
UNKNOWN	2	62.8	7.4	US
UNKNOWN	3	75.2	842.5	mVS
UNKNOWN	4	125.1	5.5	US
UNKNOWN	5	148.1	1.4	US
UNKNOWN	6	192.3	3.3	US
UNKNOWN	9	385.7	183.6	mVS

RUN #2

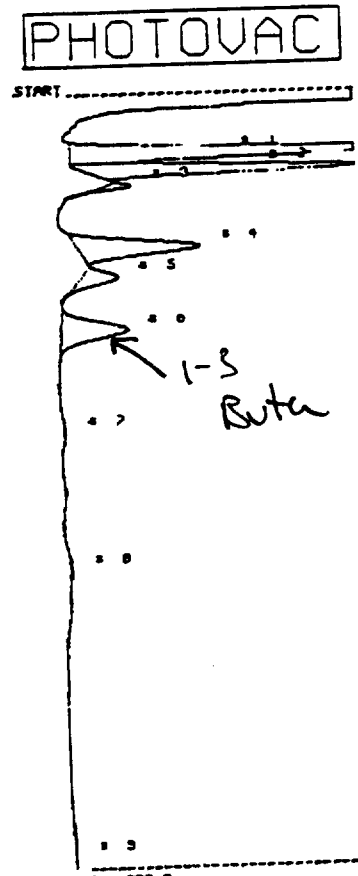


STOP @ 600.0
SAMPLE LIBRARY 1 FEB 4 1992 14:15
ANALYSIS # 19 BECHTEL
INTERNAL TEMP 33 BUTADIENE
GAIN 100 SAMPLE RUN

OFFSET	2.0 mV	
CHART SPEED	1	cM/Min
SLOPE SENS.	10 10	2 mV/Sec
WINDOW +/-	5	Percent
MINIMUM AREA	100	mVSec
TIMER DELAY	40.0	Sec
ANALYSIS TIME	600.0	Sec
CYCLE TIME	0	Min

COMPOUND NAME	PEAK	R.T.	AREA/PPM	
UNKNOWN	1	52.0	12.2	US
UNKNOWN	2	66.1	7.1	US
UNKNOWN	3	73.3	616.9	mVS
UNKNOWN	4	131.1	5.0	US
UNKNOWN	5	158.1	1.0	US
UNKNOWN	6	292.3	2.7	US
UNKNOWN	11	498.5	173.8	mVS

RUN #3



STOP @ 600.0
SAMPLE LIBRARY 1 FEB 4 1992 13:50
ANALYSIS # 17 BECHTEL
INTERNAL TEMP 33 BUTADIENE
GAIN 100 SAMPLE RUN

OFFSET	2.0 mV	
CHART SPEED	1	cM/Min
SLOPE SENS.	10 10	2 mV/Sec
WINDOW +/-	5	Percent
MINIMUM AREA	100	mVSec
TIMER DELAY	40.0	Sec
ANALYSIS TIME	600.0	Sec
CYCLE TIME	0	Min

COMPOUND NAME	PEAK	R.T.	AREA/PPM	
UNKNOWN	1	46.9	18.7	US
UNKNOWN	2	59.8	6.1	US
UNKNOWN	3	72.0	585.2	mVS
UNKNOWN	4	119.7	4.7	US
UNKNOWN	5	143.3	1.2	US
UNKNOWN	6	184.3	2.0	US

RUN #1

COMPANY : BECHTEL PETROLEUM
UNIT : K-36
DATE : 2-04-92
REPORT : 10-849

QUALITY CONTROL REPORT

METHOD 422.102
1, 3-BUTADIENE

INSTRUMENT GAIN = 100
REGRESSION FORMULA Y = 9.124 + 0.0187X

MIDPOINT CALIBRATION STANDARD

CONCENTRATION (ppbv)	RESPONSE (mVS)	DIFFERENCE FROM INITIAL	ALLOWABLE DIFFERENCE
57.7	2400	-4.00%	+/- 30%

ADDITIONAL CALIBRATION STANDARD

CONCENTRATION (ppbv)	RESPONSE (mVS)	DIFFERENCE FROM INITIAL	ALLOWABLE DIFFERENCE
57.7	2500	0.00%	+/- 30%

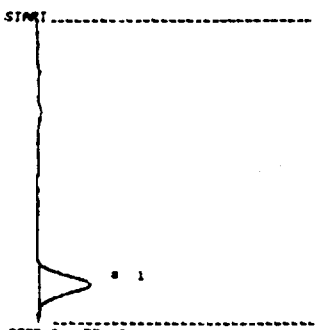
POST ANALYSIS CALIBRATION STANDARD

CONCENTRATION (ppbv)	RESPONSE (mVS)	DIFFERENCE FROM INITIAL	ALLOWABLE DIFFERENCE
57.7	3000	20.00%	+/- 30%

BIAS CHECK CALIBRATION

ACTUAL CONCENTRATION (ppbv)	MEASURED CONCENTRATION (ppbv)	RESPONSE (mVS)	DIFFERENCE FROM INITIAL
57.7	50	2200	-12.00%

PHOTOVAC

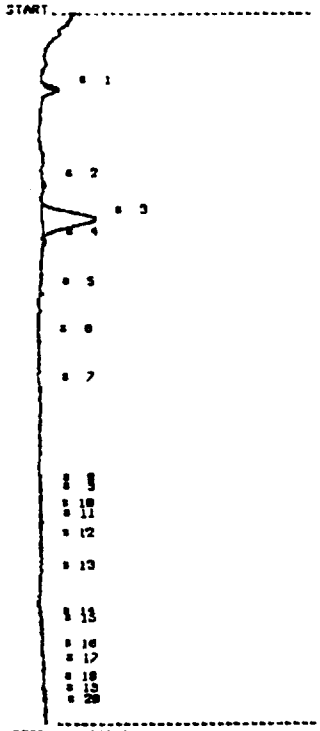


STOP @ 254.0
SAMPLE LIBRARY 1 FEB 4 1992 14:30
ANALYSIS # 21 POST CAL
INTERNAL TEMP 33 BUTADIENE
GAIN 100 57.7PPB

OFFSET	2.0 mV
CHART SPEED	1 cM/Min
SLOPE SENS.	10 10 2 mV/Sec
WINDOW +/-	5 Percent
MINIMUM AREA	100 mVSec
TIMER DELAY	40.0 Sec
ANALYSIS TIME	600.0 Sec
CYCLE TIME	0 Min

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	224.3	3.8 VS

PHOTOVAC

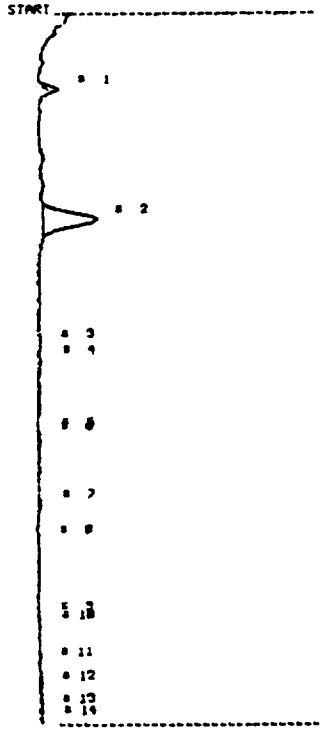


STOP @ 600.0
SAMPLE LIBRARY 1 FEB 4 1992 10:16
ANALYSIS # 10 BUTADIENE
INTERNAL TEMP 25 CAL. STD.
GAIN 100 ~~[illegible]~~ PPB
57.7 ppb

OFFSET	3.0 mV
CHART SPEED	1 cM/Min
SLOPE SENS.	10 10 2 mV/Sec
WINDOW +/-	5 Percent
MINIMUM AREA	100 mVSec
TIMER DELAY	40.0 Sec
ANALYSIS TIME	600.0 Sec
CYCLE TIME	0 Min

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	3	175.1	2.4 VS

PHOTOVAC

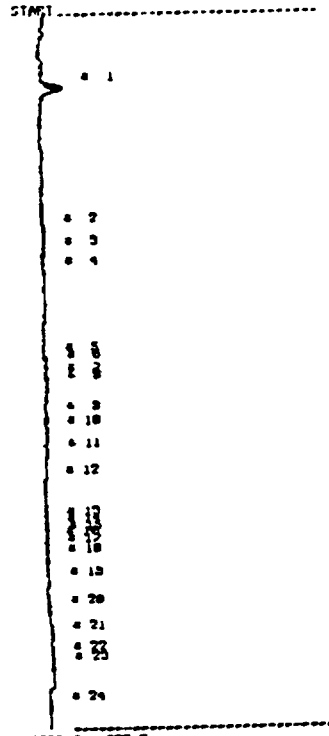


STOP @ 600.0
SAMPLE LIBRARY 1 FEB 4 1992 10:28
ANALYSIS # 11 BUTADIENE
INTERNAL TEMP 25 CAL. STD.
GAIN 100 ~~[illegible]~~ PPB
57.7 ppb

OFFSET	3.0 mV
CHART SPEED	1 cM/Min
SLOPE SENS.	10 10 2 mV/Sec
WINDOW +/-	5 Percent
MINIMUM AREA	100 mVSec
TIMER DELAY	40.0 Sec
ANALYSIS TIME	600.0 Sec
CYCLE TIME	0 Min

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	2	175.7	2.3 VS

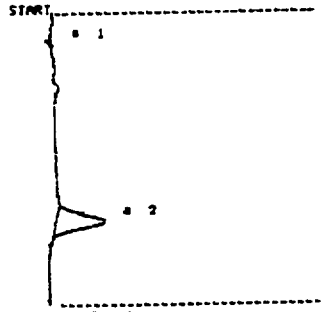
PHOTOVAC



STOP @ 682.2
SAMPLE LIBRARY 1 FEB 4 1992 9:41
ANALYSIS # 7 UHP NITROGEN
INTERNAL TEMP 24
GAIN 100

COMPOUND NAME	PEAK	R.T.	AREA/PPM

PHOTOVAC



STOP @ 246.0
SAMPLE LIBRARY 1 FEB 4 1992 14:41
ANALYSIS # 22 BIAS CAL
INTERNAL TEMP 33 BUTADIENE
GAIN 100 57.7PPB

OFFSET	2.0 mV
CHART SPEED	1 cM/Min
SLOPE SENS.	10 10 2 mV/Sec
WINDOW +/-	5 Percent
MINIMUM AREA	100 mVSec
TIMER DELAY	40.0 Sec
ANALYSIS TIME	600.0 Sec
CYCLE TIME	0 Min

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	2	[illegible]	[illegible] VS

California Air Resources Board Method 422.102
Chromatographic Analysis of 1, 3-Butadiene from Stationary Sources

Calibration Curve for Gain = 100
Raw Data and Response Factors

STANDARD CONCENTRATION (ppb v/v)	AREA RUN 1	AREA RUN 2	AREA RUN 3	AREA AVERAGE	AREA STANDARD DEVIATION
5.86	258	249.1	267.5	258.20	9.20
57.7	2500	2600	2500	2533.33	57.74
114	5100	5200	5100	5133.33	57.74
495	26200	25900	26000	26033.33	152.75

STANDARD CONCENTRATION (ppb v/v)	RESPONSE FACTOR RUN 1	RESPONSE FACTOR RUN 2	RESPONSE FACTOR RUN 3	RESPONSE FACTOR AVERAGE	RESPONSE FACTOR STANDARD DEVIATION
5.86	2.2713E-02	2.3525E-02	2.1907E-02	2.2715E-02	8.0907E-04
57.7	2.3080E-02	2.2192E-02	2.3080E-02	2.2784E-02	5.1251E-04
114	2.2353E-02	2.1923E-02	2.2353E-02	2.2210E-02	2.4818E-04
495	1.8893E-02	1.9112E-02	1.9038E-02	1.9015E-02	1.1137E-04
			RF AVG.=	2.1681E-02	
			RF STD.DEV.=	0.0017958445	
			RF RSD% =	8.28%	

Method 422.102 1, 3-Butadiene

Linear Regression Analysis (gain = 100)

Regression Output:

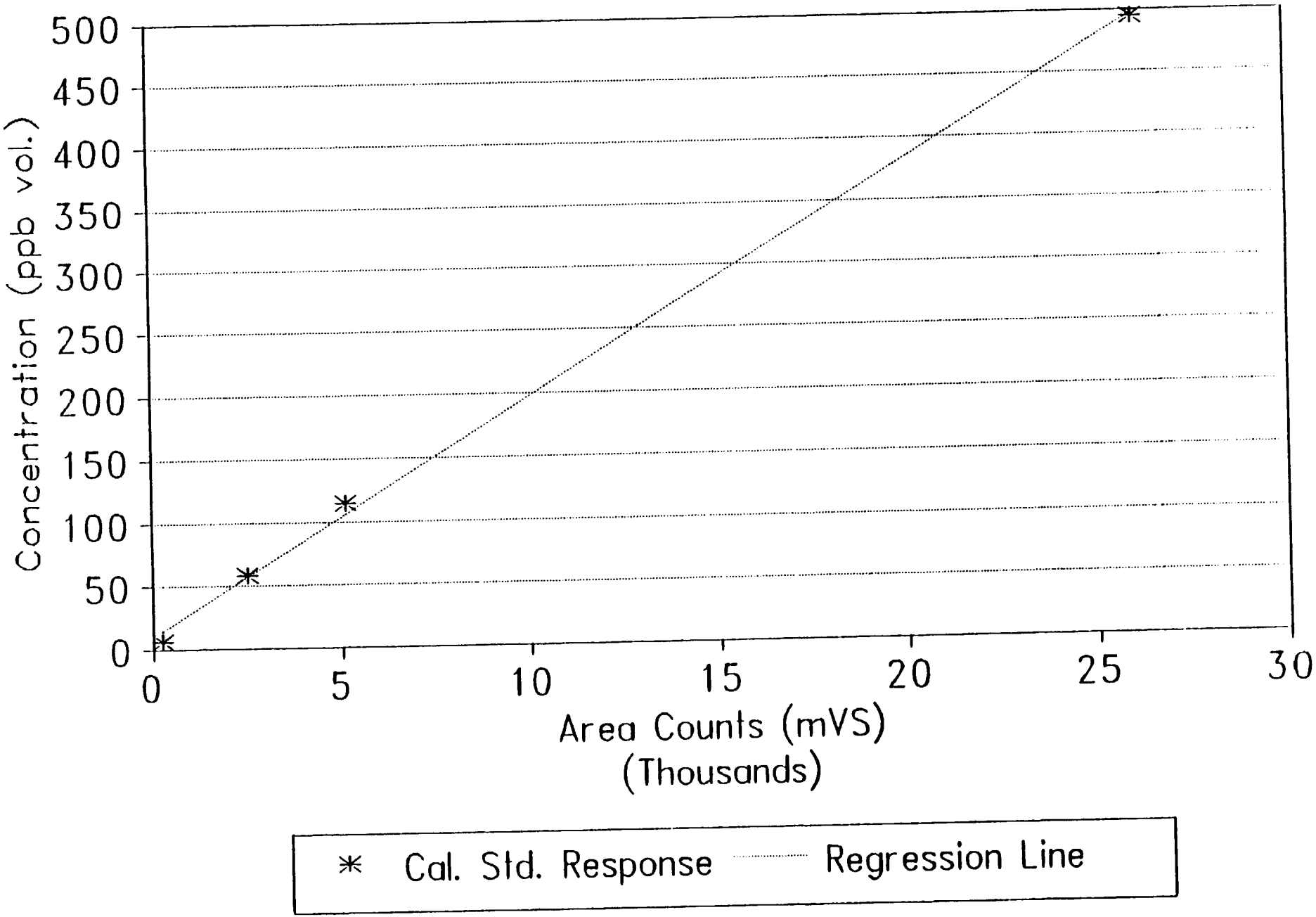
Constant	9.123749
Std Err of Y Est	8.545673
R Squared	0.999015
No. of Observations	4
Degrees of Freedom	2

X Coefficient(s)	0.018731
Std Err of Coef.	0.000416

CONC.	REGR. CONC.
5.86	13.9600
57.7	56.5752
114	105.2753
495	496.7495

Linear Regression Graph

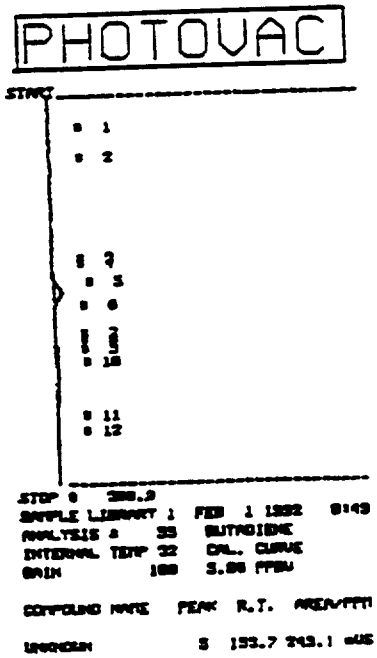
1, 3-Butadiene (gain=100)

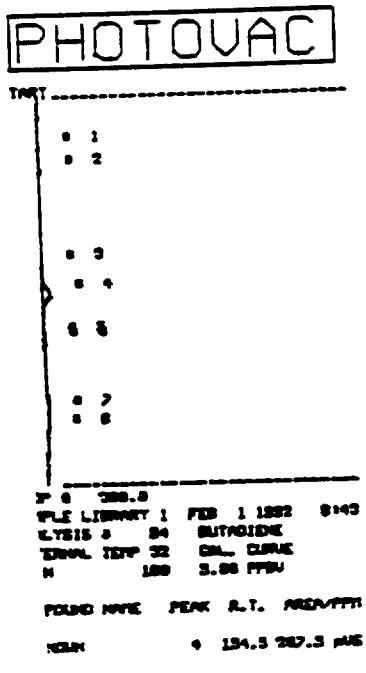


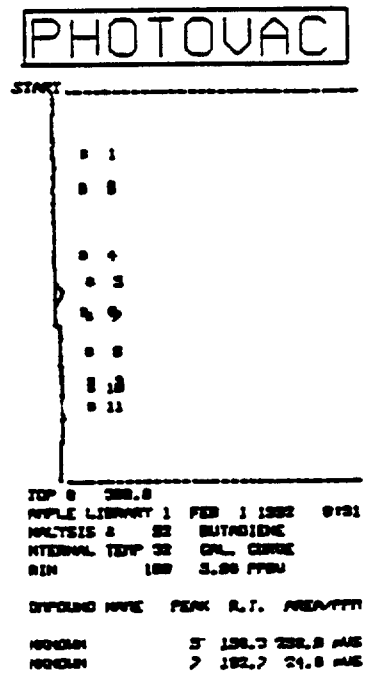
5.86ppmv 1.3-Butadiene

Calibration Gas Standard

Instrument Gain = 100



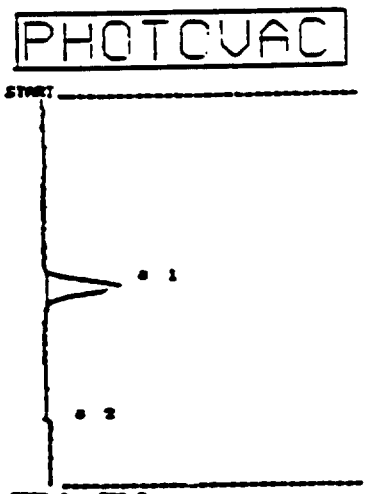


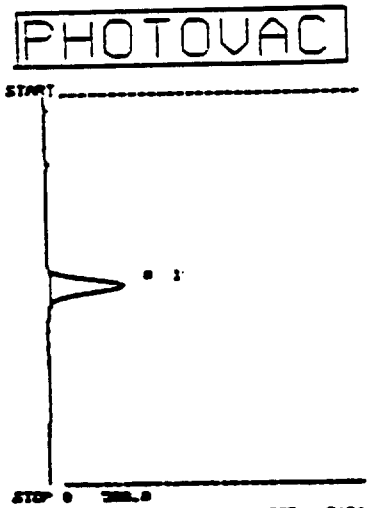


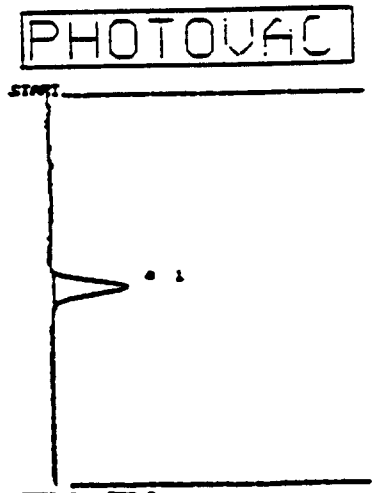
57.7ppmv 1,3-Butadiene

Calibration Gas Standard

Instrument Gain = 100



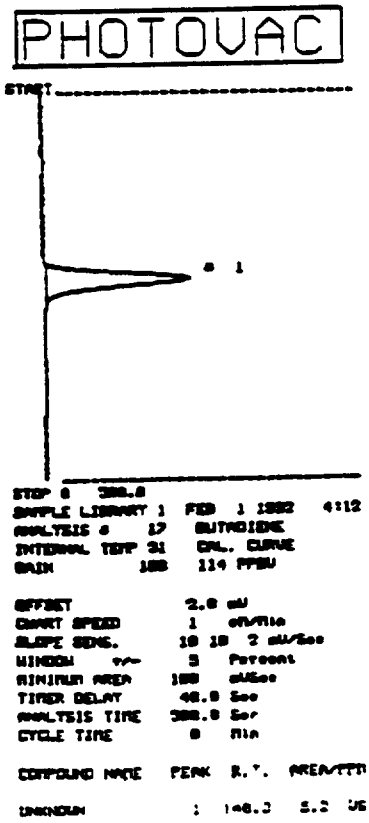


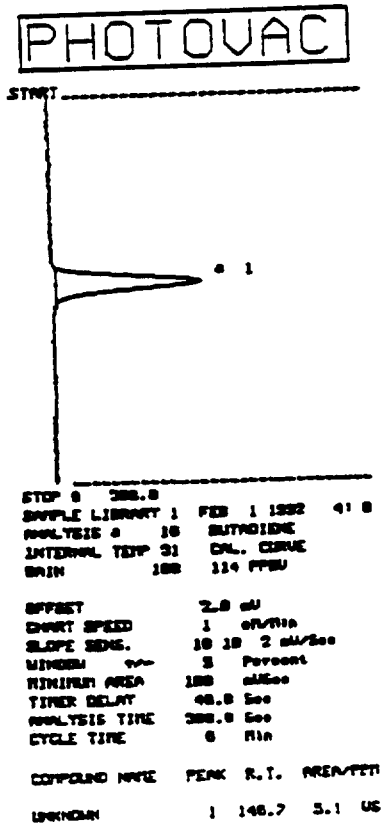


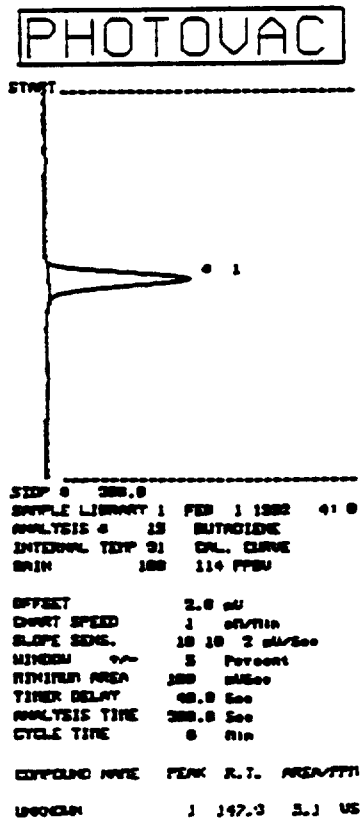
114ppmv 1,3-Butadiene

Calibration Gas Standard

Instrument Gain = 100



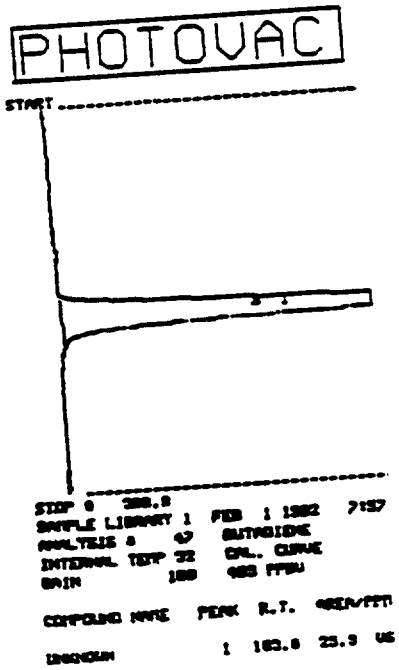


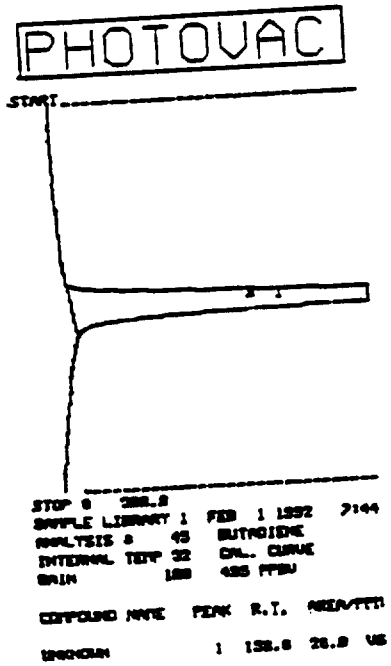


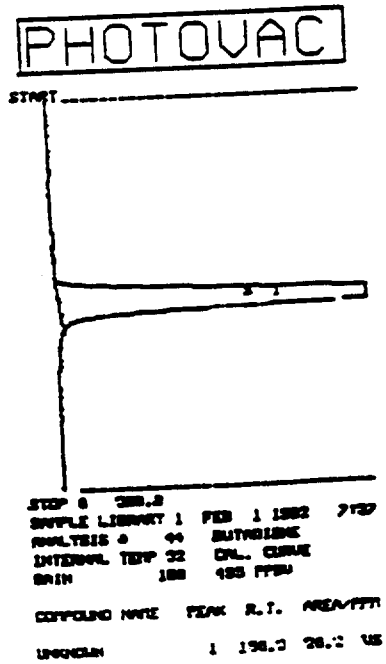
495ppmv 1,3-Butadiene

Calibration Gas Standard

Instrument Gain = 100







Scott Specialty Gases, Inc.

Shipped From: 6141 EASTON ROAD PLUMSTEADVILLE PA 18949-0310
Phone: 215-766-8861 Fax: 215-766-0320

CERTIFICATE OF ANALYSIS

PETRO CHEM ENV SERVICES

3207 ANTONINO AVENUE

BAKERSFIELD CA 93308

PROJECT #: 01-34565
PO#: 1673
ITEM #: 01029230000 CL
DATE: 1/16/92

CYLINDER #: CAL10818

ANALYTICAL ACCURACY: +/-10%

COMPONENT	REQUESTED GAS CONC MOLES		ANALYSIS (MOLES)	
1,3-BUTADIENE	5.	PPB	5.86	PPB
NITROGEN		BAL		BAL

MICROGRAV - TM

ANALYST: [signature] APPROVED BY: [signature]
M.SIRINIDES/T.NEEME

Scott Specialty Gases, Inc.

Shipped From: 6141 EASTON ROAD PLUMSTEADVILLE PA 18949-0310
Phone: 215-766-8861 Fax: 215-766-0320

CERTIFICATE OF ANALYSIS

PETRO CHEM ENV SERVICES

3207 ANTONINO AVENUE

BAKERSFIELD CA 93308

PROJECT #: 01-34565
PO#: 1673
ITEM #: 01029220060 CL
DATE: 1/16/92

CYLINDER #: CAL10937

ANALYTICAL ACCURACY: +/-10%

COMPONENT	REQUESTED GAS CONC MOLES		ANALYSIS (MOLES)	
1,3-BUTADIENE	50.	PPB	57.7	PPB
NITROGEN		BAL		BAL

MICROGRAV - TM

ANALYST: Tom Sassman APPROVED BY: Mal Sirinides
M.SIRINIDES/T.NEEME

Scott Specialty Gases, Inc.

Shipped From: 6141 EASTON ROAD PLUMSTEADVILLE PA 18949-0310
Phone: 215-766-8861 Fax: 215-766-0320

CERTIFICATE OF ANALYSIS

PETRO CHEM ENV SERVICES

3207 ANTONINO AVENUE

BAKERSFIELD CA 93308

PROJECT #: 01-34565
PO#: 1673
ITEM #: 01029210070 CL
DATE: 1/16/92

CYLINDER #: 3L5603

ANALYTICAL ACCURACY: +/-10%

COMPONENT	REQUESTED GAS CONC	MOLES	ANALYSIS (MOLES)	
1,3-BUTADIENE	100.	PPB	114.	PPB
NITROGEN		BAL		BAL

MICROGRAV - TM

ANALYST: Tom Scaramuzza APPROVED BY: M. SIRINIDES/T. NEEME

CALIBRATION GAS BLENDING RECORD
1-1-92
1, 3-Butadiene

BLEND GAS

SOURCE : Scott Specialty Gas Certified Gas Mix (Can Mix # 250)

CONCENTRATION : 9.99ppmv +/- 2%

DILUTION GAS

Ultra High Purity Nitrogen

FLOW RATES (L/min.)

BLEND GAS : 0.05

DILUTION GAS : 0.96

FINAL CONCENTRATION

1, 3-Butadiene : 0.495 ppmv
495 ppbv

CAN MIX 250
PPM (BY VOLUME) IN NITROGEN
1,3 BUTADIENE = 9.99
ACCURACY OF ANALYSIS +/-2%

CONTENTS: 8 SCF @ 260 PSIG
Store and use at room temperature (70° F

FORMULAS

AVERAGE

$$\bar{x} = \frac{\sum_{i=1}^{n} x_i}{n}$$

STANDARD DEVIATION

$$s = \sqrt{\frac{\sum_{i=1}^{n} (x_i - \bar{x})^2}{n-1}}$$

RELATIVE STANDARD DEVIATION

$$RSD\% = \frac{s}{\bar{x}} \times 100$$

RESPONSE FACTOR

$$RF = \frac{area}{concentration}$$

CORRELATION COEFFICIENT

$$R = \sqrt{R^2}$$

REGRESSION LINE EQUATION

$$\bar{y} = C + bx$$

GAS DILUTION CONCENTRATION CALCULATION

$$\frac{a}{a + b} \times c = d$$

Where:

a = Flow setting of calibration gas
b = Flow setting of dilution gas
c = Concentration of calibration gas
d = Concentration of new gas blend

COMPANY : BECHTEL PETROLEUM OPERATIONS, INC.
UNIT : K-36 LTS-1
DATE : 2-4&5-92
REPORT : 10-849A

METHOD 429
@ 60°F

DATE :	2-4	2-4	2-5
RUN #:	1	2	3
TIME :	1018	1425	940
Vm (dry gas sampled)	117.84	99.57	102.78
Y (meter calib. factor)	0.98517	0.98517	0.98517
P bar (Barometric pressure)	28.86	28.86	28.8
P static (stack pressure, " H2O)	-0.55	-0.55	-0.55
Delta H (differential meter press, " H2O)	0.74	0.56	0.589
Tm (meter temperature, R°)	562	553	551.4
Vol H2O mls	167.5	145.2	157.1
Vm(std),dscf	103.81	89.10	92.05
Bws-H2O vapor	0.0697	0.0704	0.0735
MF-moisture factor	0.930261	0.929615	0.926535
% CO2	4.05	4.07	4.15
% O2	13.8	13.75	13.6
% N2	82.15	82.18	82.25
Md-MW stk gas,dry	29.20	29.20	29.21
Ms-MW stk gas,wet	28.42	28.41	28.38
Cp-pitot tube	0.84	0.84	0.84
Avg sq rt ^p	1.09	1.10	1.16
T stack, R°	1037	1038	1064
Stack area,ft2	6.874	6.874	6.874
Vs-fps	87.70	89.30	95.26
Qstd-dscfm	16252	16521	17099
Area noz,ft2	2.41E-04	2.03E-04	2.03E-04
Sample time	180	180	180
% Isokinetic	101.4	101.4	101.2

COMPANY : BECHTEL PETROLEUM OPERATIONS, INC.
UNIT : K-36 LTS-1
DATE : 2-3/5-92
REPORT : 10-849 A

SUMMARY OF RESULTS

METHOD 429
(AVERAGE OF 3 RUNS)

Emittent	Field Blank ng	TOTAL ng	TOTAL ug	ug/DSCM	ppb	lb/hr
Naphthalene	3400	39333	39.3	1.5E+01	2.8E+00	9.3E-04
Acenaphthylene	36	643	0.64	2.4E-01	3.9E-02	1.6E-05
Acenaphthene	80	273	0.27	1.0E-01	1.6E-02	6.5E-06
Fluorene	100	760	0.76	2.9E-01	4.3E-02	1.9E-05
Phenanthrene	220	3433	3.43	1.3E+00	1.7E-01	8.1E-05
Anthracene	17	210	0.21	7.8E-02	1.1E-02	5.0E-06
Fluoranthene	33	593	0.59	2.2E-01	2.7E-02	1.4E-05
Pyrene	**5	363	0.36	1.4E-01	1.6E-02	8.7E-06
Benz (a) anthracene	**5	43	0.043	1.6E-02	1.7E-03	1.0E-06
Chrysene *1	**5	16	0.016	6.0E-03	6.5E-04	3.9E-07
Benzo(b) fluoranthene	**5	75	0.075	2.9E-02	2.8E-03	1.8E-06
Benzo(k) fluoranthene *1	**5	11	0.011	4.1E-03	3.9E-04	2.6E-07
Benzo(a)pyrene *1,2,3	**5	5	0.005	1.9E-03	1.8E-04	1.2E-07
Indeno(1,2,3-cd) pyrene	**5	13	0.013	4.7E-03	4.2E-04	3.0E-07
Dibenzo(a,h) anthracene *1,2,3	**5	5	0.005	1.9E-03	1.6E-04	1.2E-07
Benzo(g,h,i) perylene	**5	17	0.017	6.5E-03	5.8E-04	4.2E-07

* Not detected in run(s) stated, used 1/2 detection limit
** Not detected in blank, used 1/2 detection limit

COMPANY : BECHTEL PETROLEUM OPERATIONS, INC.
UNIT : K-36 LTS-1
DATE : 2-3/5-92
REPORT : 10-849A

METHOD 429
RUN #1

Emittent	TOTAL ng	TOTAL ug	ug/DSCF	ug/DSCM	ppb	lb/hr
Naphthalene	48000	48	4.6E-01	1.6E+01	3.1E+00	1.0E-03
Acenaphthylene	560	0.56	5.4E-03	1.9E-01	3.1E-02	1.2E-05
Acenaphthene	280	0.28	2.7E-03	9.5E-02	1.5E-02	6.0E-06
Fluorene	300	0.30	2.9E-03	1.0E-01	1.5E-02	6.4E-06
Phenanthrene	4300	4.3	4.1E-02	1.5E+00	2.0E-01	9.2E-05
Anthracene	240	0.24	2.3E-03	8.2E-02	1.1E-02	5.1E-06
Fluoranthene	640	0.64	6.2E-03	2.2E-01	2.6E-02	1.4E-05
Pyrene	350	0.35	3.4E-03	1.2E-01	1.4E-02	7.5E-06
Benz (a) anthracene	49	0.049	4.7E-04	1.7E-02	1.8E-03	1.0E-06
Chrysene *	5	0.005	4.8E-05	1.7E-03	1.8E-04	1.1E-07
Benzo(b) fluoranthene	47	0.047	4.5E-04	1.6E-02	1.5E-03	1.0E-06
Benzo(k) fluoranthene *	5	0.01	4.8E-05	1.7E-03	1.6E-04	1.1E-07
Benzo(a)pyrene *	5	0.01	4.8E-05	1.7E-03	1.6E-04	1.1E-07
Indeno(1,2,3-cd) pyrene	12	0.012	1.2E-04	4.1E-03	3.6E-04	2.6E-07
Dibenzo(a,h) anthracene *	5	0.01	4.8E-05	1.7E-03	1.5E-04	1.1E-07
Benzo(g,h,i) perylene	15	0.015	1.4E-04	5.1E-03	4.5E-04	3.2E-07

* Not detected, used 1/2 detection limit

Vm(std), dscf = 103.81
Vm(std), dscm = 2.94
DSCFM = 16252

COMPANY : BECHTEL PETROLEUM OPERATIONS, INC.
UNIT : K-36 LTS-1
DATE : 2-3/5-92
REPORT : 10-849 A

METHOD 429
RUN #2

Emittent	TOTAL ng	TOTAL ug	ug/DSCF	ug/DSCM	ppb	lb/hr
Naphthalene	40000	40	4.5E-01	1.6E+01	3.0E+00	1.0E-03
Acenaphthylene	590	0.59	6.6E-03	2.3E-01	3.8E-02	1.5E-05
Acenaphthene	280	0.28	3.1E-03	1.1E-01	1.8E-02	7.1E-06
Fluorene	880	0.88	9.9E-03	3.5E-01	5.1E-02	2.2E-05
Phenanthrene	2500	2.5	2.8E-02	9.9E-01	1.4E-01	6.3E-05
Anthracene	220	0.22	2.5E-03	8.7E-02	1.2E-02	5.6E-06
Fluoranthene	590	0.59	6.6E-03	2.3E-01	2.8E-02	1.5E-05
Pyrene	420	0.42	4.7E-03	1.7E-01	2.0E-02	1.1E-05
Benz (a) anthracene	44	0.044	4.9E-04	1.7E-02	1.9E-03	1.1E-06
Chrysene	24	0.024	2.7E-04	9.5E-03	1.0E-03	6.1E-07
Benzo(b) fluoranthene	69	0.069	7.7E-04	2.7E-02	2.6E-03	1.7E-06
Benzo(k) fluoranthene	13	0.013	1.5E-04	5.2E-03	5.0E-04	3.3E-07
Benzo(a)pyrene *	5	0.005	5.6E-05	2.0E-03	1.9E-04	1.3E-07
Indeno(1,2,3-cd) pyrene	14	0.014	1.6E-04	5.5E-03	4.9E-04	3.5E-07
Dibenzo(a,h) anthracene *	5	0.005	5.6E-05	2.0E-03	1.7E-04	1.3E-07
Benzo(g,h,i) perylene	22	0.022	2.5E-04	8.7E-03	7.7E-04	5.6E-07

* Not detected, used 1/2 detection limit

Vm(std), dscf = 89.10
Vm(std), dscm = 2.52
DSCFM = 16521

COMPANY : BECHTEL PETROLEUM OPERATIONS, INC.
UNIT : K-36 LTS-1
DATE : 2-3/5-92
REPORT : 10-849A

METHOD 429
RUN #3

Emittent	TOTAL ng	TOTAL ug	ug/DSCF	ug/DSCM	ppb	lb/hr
Naphthalene	30000	30	3.3E-01	1.2E+01	2.2E+00	7.6E-04
Acenaphthylene	780	0.8	8.5E-03	3.0E-01	4.8E-02	2.0E-05
Acenaphthene	260	0.26	2.8E-03	1.0E-01	1.6E-02	6.6E-06
Fluorene	1100	1.10	1.2E-02	4.2E-01	6.2E-02	2.8E-05
Phenanthrene	3500	3.50	3.8E-02	1.3E+00	1.8E-01	8.9E-05
Anthracene	170	0.17	1.8E-03	6.5E-02	8.9E-03	4.3E-06
Fluoranthene	550	0.55	6.0E-03	2.1E-01	2.5E-02	1.4E-05
Pyrene	320	0.32	3.5E-03	1.2E-01	1.5E-02	8.1E-06
Benz (a) anthracene	36	0.04	3.9E-04	1.4E-02	1.5E-03	9.1E-07
Chrysene	18	0.018	2.0E-04	6.9E-03	7.4E-04	4.6E-07
Benzo(b) fluoranthene	110	0.110	1.2E-03	4.2E-02	4.1E-03	2.8E-06
Benzo(k) fluoranthene	14	0.014	1.5E-04	5.4E-03	5.2E-04	3.5E-07
Benzo(a)pyrene *	5	0.005	5.4E-05	1.9E-03	1.9E-04	1.3E-07
Indeno(1,2,3-cd) pyrene	12	0.012	1.3E-04	4.6E-03	4.1E-04	3.0E-07
Dibenzo(a,h) anthracene *	5	0.005	5.4E-05	1.9E-03	1.7E-04	1.3E-07
Benzo(g,h,i) perylene	15	0.015	1.6E-04	5.8E-03	5.1E-04	3.8E-07

* Not detected, used 1/2 detection limit

Vm(std), dscf = 92.05
Vm(std), dscm = 2.61
DSCFM = 17099

ALTA

K-36

February 18, 1992

Alta Batch I.D.: 10995

Mr. Tim Brennan
PetroChem Environmental Serv.
3207 Antonino Ave.
Bakersfield, CA 93388

Dear Mr. Brennan,

Enclosed are the results for the four MM5 trains received at Alta Analytical Laboratory on February 8, 1992. This work was authorized under your Purchase Order Number 01757. These samples were analyzed using CARB Method 429 for polycyclic aromatic hydrocarbons (PAH) using High Resolution Mass Spectrometry (HRMS). A standard turnaround time was requested for this work.

The following difficulties were associated with the analysis of these samples. For Sample ID.'s Run 1, 2, and 3 the naphthalene and phenanthrene results were quantitated using the confirmation ion because the primary ion saturated the detector. This is designated on the data sheet with an " * " asterisk. Some samples had internal standard recoveries below 50%. However, in every instance the signal-to-noise ratio was greater than 10:1, therefore no further action was required, as per the method.

The following report consists of a Sample Inventory (Section I), Analytical Results (Section II) and the Appendix. The Appendix contains a copy of the chain-of-custody, a list of data qualifiers and abbreviations and copies of the raw data (if requested).

If you have any questions regarding this report please feel free to contact me.

Sincerely,

Robert S. Mitzel

Robert S. Mitzel
Director of Operations

Alta Analytical Laboratory Inc.
5070 Robert J. Mathews Pkwy., Suite 2
El Dorado Hills, CA. 95630

ALTA

Section I. Sample Inventory

Date Received: 8-Feb-92

Alta Lab ID.		Client ID.
10995-1-A	K 36 FIELD BLANK	A-100 FILTER BLNK
10995-1-B		A-105 XAD BLNK
10995-1-C		A101 PROBE RINSE BLNK
10995-1-D		A-102 CONDENSER BLANK
10995-1-E		A-103 1ST IMP RINSE BLK
10995-1-F		A-104 2ND IMP RINSE BLK
10995-2-A	K36 RUN #1	A-1 FILTER
10995-2-B		A-6 XAD
10995-2-C		A-2 PROBE RINSE
10995-2-D		A-3 CONDENSER RINSE
10995-2-E		A-4 1ST IMP RINSE
10995-2-F		A-5 2ND IMP RINSE
10995-3-A	K 36 RUN #2	A-7 FILTER
10995-3-B		A-12 XAD
10995-3-C		A-8 PROBE RINSE
10995-3-D		A-9 CONDENSER RINSE
10995-3-E		A-10 1ST IMP RINSE
10995-3-F		A-11 2ND IMP RINSE
10995-4-A	K36 RUN #3	A-13 FILTER
10995-4-B		A-18 XAD
10995-4-C		A-14 PROBE RINSE
10995-4-D		A-15 CONDENSER RINSE
10995-4-E		A-16 1ST IMP RINSE
10995-4-F		A-17 2ND IMP RINSE
10995-5-SA	K36 REAGENT BLANKS "HOLD"	A-106 HEXANE BLNK ARCHIV
10995-6-SA		A-107 METHANOL BLNK ARCHI
10995-7-SA		A-108 MeCl2 BLNK ARCHIVE
10995-8-SA		A-109 DIST H2O BLNK ARCHI

ALTA

POLYCYCLIC AROMATIC HYROCARBONS (PAH)
CALIFORNIA AIR RESOURCES BOARD METHOD 429

Sample ID: BLANK
Lab ID: 10995-001-PAH
Matrix: MM5

Date Received: 2/8/92
Date Extracted: 2/10/92
Sample Amount: Sample

ICAL ID: IPNAFE
QC Lot: LC0210M
Units: ng/sample

Compound	Conc.	R.L.	Qualifier
Naphthalene	3400		B
Acenaphthylene	36		
Acenaphthene	80		
Fluorene	100		B
Phenanthrene	220		B
Anthracene	17		
Fluoranthene	33		
Pyrene	ND	10	
Chyrsene	ND	10	
Benz(a)anthracene	ND	10	
Benzo(b)fluoranthene	ND	10	
Benzo(k)fluoranthene	ND	10	
Benzo(a)pyrene	ND	10	
Benzo(e)pyrene	NA		
Indeno(1,2,3-c,d)pyrene	ND	10	
Dibenz(a,h)anthracene	ND	10	
Benzo(g,h,i)perylene	ND	10	

K-36 Field Blank

Analyst: JMW

Reviewer: BHY

Petro Chem Environmental Services, Inc.

SECTION II.

ALTA

POLYCYCLIC AROMATIC HYDROCARBONS (PAH)
CALIFORNIA AIR RESOURCES BOARD METHOD 429

Sample ID: BLANK
Lab ID: 10995-001-PAH

Isotopic Recovery Results

Internal Standard:	% R	Qualifier
d_8-Naphthalene	25	H
d_8-Acenaphthylene	30	H
d_{10}-Acenaphthene	41	H
d_{10}-Fluorene	59	
d_{10}-Phenanthrene	79	
d_{10}-Anthracene	64	
d_{10}-Fluoranthene	84	
d_{10}-Pyrene	86	
d_{12}-Chrysene	82	
d_{12}-Benz(a)anthracene	81	
d_{12}-Benzo(b)fluoranthene	85	
d_{12}-Benzo(k)fluoranthene	79	
d_{12}-Benzo(a)pyrene	55	
d_{12}-Indeno(1,2,3-c,d)pyrene	71	
d_{12}-Benzo(g,h,i)perylene	68	
d_{14}-Dibenz(a,h)anthracene	74	
Pre-spike Recovery Standard:		
d_{12}-Benzo(e)pyrene	141	
d_{14}-Terphenyl	116	

Date Analyzed: 2/12/92

Analyst: [signature]

Reviewer: [signature]

Petro Chem Environmental Services, Inc.

ALTA

POLYCYCLIC AROMATIC HYROCARBONS (PAH)
CALIFORNIA AIR RESOURCES BOARD METHOD 429

Sample ID: Run #1
Lab ID: 10995-002-PAH
Matrix: MM5

Date Received: 2/8/92
Date Extracted: 2/10/92
Sample Amount: Sample

ICAL ID: IPNAFE
QC Lot: LC0210M
Units: ng/sample

Compound	Conc.	R.L.	Qualifier
Naphthalene	48000		*,B
Acenaphthylene	560		
Acenaphthene	280		
Fluorene	300		B
Phenanthrene	4300		*,B
Anthracene	240		
Fluoranthene	640		
Pyrene	350		
Chyrsene	ND	10	
Benz(a)anthracene	49		
Benzo(b)fluoranthene	47		
Benzo(k)fluoranthene	ND	10	
Benzo(a)pyrene	ND	10	
Benzo(e)pyrene	NA		
Indeno(1,2,3-c,d)pyrene	12		
Dibenz(a,h)anthracene	ND	10	
Benzo(g,h,i)perylene	15		

K-36 RUN #1

Analyst: [signature]

Reviewer: [signature]

Petro Chem Environmental Services, Inc.

ALTA

POLYCYCLIC AROMATIC HYDROCARBONS (PAH)
CALIFORNIA AIR RESOURCES BOARD METHOD 429

Sample ID: Run #1
Lab ID: 10995-002-PAH

Isotopic Recovery Results

Internal Standard:	% R	Qualifier
d_8-Naphthalene	49	H
d_8-Acenaphthylene	70	
d_{10}-Acenaphthene	76	
d_{10}-Fluorene	51	
d_{10}-Phenanthrene	111	
d_{10}-Anthracene	107	
d_{10}-Fluoranthene	51	
d_{10}-Pyrene	60	
d_{12}-Chrysene	73	
d_{12}-Benz(a)anthracene	66	
d_{12}-Benzo(b)fluoranthene	80	
d_{12}-Benzo(k)fluoranthene	73	
d_{12}-Benzo(a)pyrene	76	
d_{12}-Indeno(1,2,3-c,d)pyrene	110	
d_{12}-Benzo(g,h,i)perylene	110	
d_{14}-Dibenz(a,h)anthracene	121	
Pre-spike Recovery Standard:		
d_{12}-Benzo(e)pyrene	93	
d_{14}-Terphenyl	94	

Date Analyzed: 2/12/92

Analyst: [signature] **Page 2 of 2** **Reviewer:** [signature]

Petro Chem Environmental Services, Inc.

ALTA

POLYCYCLIC AROMATIC HYROCARBONS (PAH)
CALIFORNIA AIR RESOURCES BOARD METHOD 429

Sample ID: Run #2 **Date Received:** 2/8/92 **ICAL ID:** IPNAFE
Lab ID: 10995-003-PAH **Date Extracted:** 2/10/92 **QC Lot:** LC0210M
Matrix: MM5 **Sample Amount:** Sample **Units:** ng/sample

Compound	Conc.	R.L.	Qualifier
Naphthalene	40000		*,B
Acenaphthylene	590		
Acenaphthene	280		
Fluorene	880		B
Phenanthrene	2500		B
Anthracene	220		
Fluoranthene	590		
Pyrene	420		
Chyrsene	24		
Benz(a)anthracene	44		
Benzo(b)fluoranthene	69		
Benzo(k)fluoranthene	13		
Benzo(a)pyrene	ND	10	
Benzo(e)pyrene	NA		
Indeno(1,2,3-c,d)pyrene	14		
Dibenz(a,h)anthracene	ND	10	
Benzo(g,h,i)perylene	22		

K-36 RUN #2

Analyst: JMK

Reviewer: BM

Petro Chem Environmental Services, Inc.

ALTA

POLYCYCLIC AROMATIC HYDROCARBONS (PAH)
CALIFORNIA AIR RESOURCES BOARD METHOD 429

Sample ID: Run #2
Lab ID: 10995-003-PAH

Isotopic Recovery Results

Internal Standard:	% R	Qualifier
d_8-Naphthalene	63	
d_8-Acenaphthylene	80	
d_{10}-Acenaphthene	94	
d_{10}-Fluorene	79	
d_{10}-Phenanthrene	131	
d_{10}-Anthracene	106	
d_{10}-Fluoranthene	55	
d_{10}-Pyrene	64	
d_{12}-Chrysene	76	
d_{12}-Benz(a)anthracene	65	
d_{12}-Benzo(b)fluoranthene	63	
d_{12}-Benzo(k)fluoranthene	77	
d_{12}-Benzo(a)pyrene	82	
d_{12}-Indeno(1,2,3-c,d)pyrene	129	
d_{12}-Benzo(g,h,i)perylene	127	
d_{14}-Dibenz(a,h)anthracene	142	
Pre-spike Recovery Standard:		
d_{12}-Benzo(e)pyrene	90	
d_{14}-Terphenyl	84	

Date Analyzed: 2/13/92

Analyst: [illegible] **Page 2 of 2** **Reviewer:** [illegible]

Petro Chem Environmental Services, Inc.

ALTA

POLYCYCLIC AROMATIC HYROCARBONS (PAH)
CALIFORNIA AIR RESOURCES BOARD METHOD 429

Sample ID: Run #3 **Date Received:** 2/8/92 **ICAL ID:** IPNAFE
Lab ID: 10995-004-PAH **Date Extracted:** 2/10/92 **QC Lot:** LC0210M
Matrix: MM5 **Sample Amount:** Sample **Units:** ng/sample

Compound	Conc.	R.L.	Qualifier
Naphthalene	30000		*,B
Acenaphthylene	780		
Acenaphthene	260		
Fluorene	1100		B
Phenanthrene	3500		*,B
Anthracene	170		
Fluoranthene	550		
Pyrene	320		
Chyrsene	18		
Benz(a)anthracene	36		
Benzo(b)fluoranthene	110		
Benzo(k)fluoranthene	14		
Benzo(a)pyrene	ND	10	
Benzo(e)pyrene	NA		
Indeno(1,2,3-c,d)pyrene	12		
Dibenz(a,h)anthracene	ND	10	
Benzo(g,h,i)perylene	15		

K-36 RUN #3

Analyst: [signature] Page 1 of 2 Reviewer: [signature]

Petro Chem Environmental Services, Inc.

ALTA

POLYCYCLIC AROMATIC HYDROCARBONS (PAH)
CALIFORNIA AIR RESOURCES BOARD METHOD 429

Sample ID: Run #3
Lab ID: 10995-004-PAH

Isotopic Recovery Results

Internal Standard:	% R	Qualifier
d_8-Naphthalene	62	
d_8-Acenaphthylene	80	
d_{10}-Acenaphthene	92	
d_{10}-Fluorene	62	
d_{10}-Phenanthrene	138	
d_{10}-Anthracene	108	
d_{10}-Fluoranthene	50	
d_{10}-Pyrene	60	
d_{12}-Chrysene	79	
d_{12}-Benz(a)anthracene	64	
d_{12}-Benzo(b)fluoranthene	47	H
d_{12}-Benzo(k)fluoranthene	76	
d_{12}-Benzo(a)pyrene	82	
d_{12}-Indeno(1,2,3-c,d)pyrene	135	
d_{12}-Benzo(g,h,i)perylene	139	
d_{14}-Dibenz(a,h)anthracene	150	
Pre-spike Recovery Standard:		
d_{12}-Benzo(e)pyrene	95	
d_{14}-Terphenyl	96	

Date Analyzed: 2/13/92

Analyst: [illegible] **Page 2 of 2** **Reviewer:** [illegible]

Petro Chem Environmental Services, Inc.

APPENDIX

DATA QUALIFIERS & ABBREVIATIONS

A	The amount detected is below the Method Quantitation Limit.
B	This compound was also detected in the blank.
C	The amount detected is less than five times the Method Quantitation Limit.
D	The amount reported is the maximum possible concentration.
E	The detection limit was raised above the Method Quantitation Limit due to chemical interferences.
F	This result has been reported off the DB-225 column.
G	This resulted has been reported off the SP-2331 column.
H	The signal-to-noise ratio is greater than 10:1.
I	Chemical Interference
Conc.	Concentration
D.L.	Detection Limit
NA	Not applicable
S/N	Signal-to-noise
MPC	Maximum Possible Concentration
*	See Cover Letter
R.L.	Reporting Limit

ALTA

POLYCYCLIC AROMATIC HYROCARBONS (PAH)
CALIFORNIA AIR RESOURCES BOARD METHOD 429

METHOD BLANK
Lab ID: 10995-MB-PAH
Matrix: MM5

Date Received: NA
Date Extracted: 2/10/92
Sample Amount: Sample

ICAL ID: IPNAFE
QC Lot: LC0210M
Units: ng/sample

Compound	Conc.	R.L.	Qualifier
Naphthalene	30		
Acenaphthylene	ND	10	
Acenaphthene	ND	10	
Fluorene	11		
Phenanthrene	26		
Anthracene	ND	10	
Fluoranthene	ND	10	
Pyrene	ND	10	
Chrysene	ND	10	
Benz(a)anthracene	ND	10	
Benzo(b)fluoranthene	ND	10	
Benzo(k)fluoranthene	ND	10	
Benzo(a)pyrene	ND	10	
Benzo(e)pyrene	NA	NA	
Indeno(1,2,3-c,d)pyrene	ND	10	
Dibenz(a,h)anthracene	ND	10	
Benzo(g,h,i)perylene	ND	10	

K-36 Lab QC

Analyst: [signature]

Reviewer: [signature]

Petro Chem Environmental Services, Inc.

ALTA

POLYCYCLIC AROMATIC HYDROCARBONS (PAH)
CALIFORNIA AIR RESOURCES BOARD METHOD 429

METHOD BLANK
Lab ID: 10995-MB-PAH

Isotopic Recovery Results

Internal Standard:	% R	Qualifier
d_8-Naphthalene	67	
d_8-Acenaphthylene	74	
d_{10}-Acenaphthene	79	
d_{10}-Fluorene	81	
d_{10}-Phenanthrene	83	
d_{10}-Anthracene	70	
d_{10}-Fluoranthene	88	
d_{10}-Pyrene	100	
d_{12}-Chrysene	79	
d_{12}-Benz(a)anthracene	80	
d_{12}-Benzo(b)fluoranthene	75	
d_{12}-Benzo(k)fluoranthene	76	
d_{12}-Benzo(a)pyrene	65	
d_{12}-Indeno(1,2,3-c,d)pyrene	65	
d_{12}-Benzo(g,h,i)perylene	72	
d_{14}-Dibenz(a,h)anthracene	62	

Pre-spike Recovery Standard:

K-36 Lab QC

d_{12}-Benzo(e)pyrene	NA
d_{14}-Terphenyl	NA

Date Analyzed: 2/12/92

Analyst: [signature]

Reviewer: [signature]

Petro Chem Environmental Services, Inc.

ALTA

POLYCYCLIC AROMATIC HYDROCARBONS (PAH)
CALIFORNIA AIR RESOURCES BOARD METHOD 429

LCS RESULTS
Lab ID: 10995-LCS1/LCS2
Matrix: MM5

Date Received: NA
Date Extracted: 2/10/92
Sample Amount: Sample

ICAL ID: IPNAFE
QC Lot: LC0210M
Units: NA

COMPOUND	LCS1 % R	LCS2 % R	RPD %
Naphthalene	111	119	7.0
Acenaphthylene	77	92	18
Acenaphthene	95	89	6.5
Fluorene	122	106	12
Phenanthrene	114	79	36
Anthracene	83	88	5.9
Fluoranthene	111	114	2.7
Pyrene	101	104	2.9
Chrysene	79	78	1.3
Benza(a)anthracene	92	85	7.9
Benzo(b)fluoranthene	91	81	13
Benzo(k)fluoranthene	92	84	9.1
Benzo(a)pyrene	95	84	12
Benzo(e)pyrene	NA	NA	NA
Indeno(1,2,3-c,d)pyrene	94	95	1.1
Dibenz(a,h)anthracene	98	86	13
Benzo(g,h,i)perylene	99	85	15

K-36 Lab QC

Analyst: JM

Reviewer: [illegible]

Petro Chem Environmental Services, Inc.

ALTA

POLYCYCLIC AROMATIC HYDROCARBONS (PAH)
CALIFORNIA AIR RESOURCES BOARD METHOD 429

LCS RESULTS
Lab ID: 10995-LCS1/LCS2

Isotopic Recovery Results

Internal Standard:	LCS1 % R	LCS2 % R
d_8-Napththalene	55	59
d_8-Acenaphthylene	71	75
d_{10}-Acenaphthene	73	81
d_{10}-Fluorene	58	91
d_{10}-Phenanthrene	64	133
d_{10}-Anthracene	60	109
d_{10}-Fluoranthene	79	50
d_{10}-Pyrene	93	58
d_{12}-Chrysene	90	76
d_{12}-Benz(a)anthracene	77	65
d_{12}-Benzo(b)fluoranthene	87	97
d_{12}-Benzo(k)fluoranthene	81	82
d_{12}-Benzo(a)pyrene	80	85
d_{12}-Indeno(1,2,3-c,d)pyrene	77	98
d_{12}-Benzo(g,h,i)perylene	77	117
d_{14}-Dibenz(a,h)anthracene	80	136

K-36 Lab QC

Date Analyzed: 2/13/92

Analyst: [signature]

Reviewer: [signature]

Petro Chem Environmental Services, Inc.

ALTA

POLYCYCLIC AROMATIC HYROCARBONS (PAH)
CALIFORNIA AIR RESOURCES BOARD METHOD 429

XAD QC BLANK T617
Lab ID: 10995-XAD-PAH
Matrix: MM5

Date Received: NA
Date Extracted: 12/30/91
Sample Amount: Sample

ICAL ID: IPNAJA7
QC Lot: LC0210M
Units: ng/sample

Compound	Conc.	R.L.	Qualifier
Naphthalene	290		
Acenaphthylene	ND	10	
Acenaphthene	ND	10	
Fluorene	ND	10	
Phenanthrene	24		
Anthracene	ND	10	
Fluoranthene	ND	10	
Pyrene	ND	10	
Chrysene	ND	10	
Benz(a)anthracene	ND	10	
Benzo(b)fluoranthene	ND	10	
Benzo(k)fluoranthene	ND	10	
Benzo(a)pyrene	ND	10	
Benzo(e)pyrene	NA	NA	
Indeno(1,2,3-c,d)pyrene	ND	10	
Dibenz(a,h)anthracene	ND	10	
Benzo(g,h,i)perylene	ND	10	

K-36 Lab QC

Analyst: [signature]

Reviewer: [signature]

Petro Chem Environmental Services, Inc.

ALTA

POLYCYCLIC AROMATIC HYDROCARBONS (PAH)
CALIFORNIA AIR RESOURCES BOARD METHOD 429

XAD QC BLANK T617
Lab ID: 10995-XAD-PAH

Isotopic Recovery Results

Internal Standard:	% R	Qualifier
d_8-Naphthalene	73	
d_8-Acenaphthylene	60	
d_{10}-Acenaphthene	69	
d_{10}-Fluorene	68	
d_{10}-Phenanthrene	69	
d_{10}-Anthracene	NA	
d_{10}-Fluoranthene	99	
d_{10}-Pyrene	109	
d_{12}-Chrysene	84	
d_{12}-Benz(a)anthracene	101	
d_{12}-Benzo(b)fluoranthene	112	
d_{12}-Benzo(k)fluoranthene	94	
d_{12}-Benzo(a)pyrene	74	
d_{12}-Indeno(1,2,3-c,d)pyrene	104	
d_{12}-Benzo(g,h,i)perylene	98	
d_{14}-Dibenz(a,h)anthracene	104	

Pre-spike Recovery Standard: K-36 Lab QC

d_{12}-Benzo(e)pyrene	NA
d_{14}-Terphenyl	NA

Date Analyzed: 1/07/92

Analyst: [signature]

Reviewer: [signature]

Petro Chem Environmental Services, Inc.

COMPANY : BECHTEL PETROLEUM OPERATIONS, INC.
UNIT : K-36 LTS-1
DATE : 2-4-92
REPORT : 10-849A

CARB METHOD 430
SUMMARY OF RESULTS

	TOTAL ug/CM			
COMPOUND	RUN #1	RUN #2	RUN #3	AVERAGE
Formaldehyde	5281	10833	5294	7136
Acetaldehyde *1	23	217	1376	539
Acrolein *1,2	23	33	85	47

	LBS/HR			
COMPOUND	RUN #1	RUN #2	RUN #3	AVERAGE
Formaldehyde	3.4E-01	7.0E-01	3.4E-01	4.6E-01
Acetaldehyde *1	1.5E-03	1.4E-02	8.8E-02	3.5E-02
Acrolein *1,2	1.5E-03	2.1E-03	5.4E-03	3.0E-03

* Not detected in runs stated, used 1/2 detection limit

COMPANY : BECHTEL PETROLEUM OPERATIONS, INC.
UNIT : K-36 LTS-1
DATE : 2-5-92
REPORT : 10-849A

METHOD 430
@ 60° F

RUN #:	1	2	3
TIME :	1340	1521	1702
Vm (dry gas sampled)	1.75	1.75	1.75
Y (meter calib. factor)	1.00	1.00	1.00
P bar (Barometric pressure)	28.8	28.8	28.8
P static (stack pressure, " H2O)	-0.55	-0.55	-0.55
Delta H (differential meter press, " H2O)	0	0	0
Tm (meter temperature, R°)	544	544	540
Vm(std),dscf	1.61	1.61	1.62
Vm(std),dscm	0.0456	0.0456	0.0459

COMPANY : BECHTEL PETROLEUM OPERATIONS, INC.
UNIT : K-36 LTS-1
DATE : 2-04-92
REPORT : 10-849A

Method 430

Formaldehyde Results

Test Run	#1	#2	#3
ug/l	14000	20000	10000
Sample vol, l	0.0172	0.0247	0.0243
Total ug	241	494	243
Vm std DSCF	1.61	1.61	1.62
Vm std DSCM	0.0456	0.0456	0.0459
Volume Flow, DSCFM	16624	16624	16624

Concentrations **AVERAGE**

ug/dscf	150	307	150	202
ug/dscm	5281	10833	5294	7136
ppb	4297	8815	4308	5806

Emissions

lb/hr	3.4E-01	7.0E-01	3.4E-01	4.6E-01

COMPANY : BECHTEL PETROLEUM OPERATIONS, INC.
UNIT : K-36 LTS-1
DATE : 2-04-92
REPORT : 10-849A

Method 430

Acetaldehyde Results

Test Run	#1 *	#2	#3
ug/l	60	400	2600
Sample vol, l	0.0172	0.0247	0.0243
Total ug	1	10	63
Vm std DSCF	1.61	1.61	1.62
Vm std DSCM	0.0456	0.0456	0.0459
Volume Flow, DSCFM	16624	16624	16624

*Not Detected, used 1/2 detection limit

Concentrations

				AVERAGE
ug/dscf	0.641	6.14	39.0	15.3
ug/dscm	23	217	1376	539
ppb	13	120	764	299

Emissions

lb/hr	1.5E-03	1.4E-02	8.8E-02	3.5E-02

COMPANY : BECHTEL PETROLEUM OPERATIONS, INC.
UNIT : K-36 LTS-1
DATE : 2-04-92
REPORT : 10-849A

Method 430

Acrolein Results

Test Run	#1 *	#2 *	#3
ug/l	60	60	160
Sample vol, l	0.0172	0.0247	0.0243
Total ug	1.0	1.5	3.9
Vm std DSCF	1.61	1.61	1.62
Vm std DSCM	0.0456	0.0456	0.0459
Volume Flow, DSCFM	16624	16624	16624

*Not Detected, used 1/2 detection limit

Concentrations

				AVERAGE
ug/dscf	0.64	0.92	2.40	1.32
ug/dscm	23	33	85	47
ppb	10	14	37	20

Emissions

lb/hr	1.5E-03	2.1E-03	5.4E-03	3.0E-03

COMPANY : BECHTEL PETROLEUM OPERATIONS, INC.
UNIT : K-36 LTS-1
DATE : 2-04-92
REPORT : 10-849A

Method 430

Formaldehyde Results

FIELD BLANK

Test Run	#1	#2	#3 *	AVERAGE
ug/l	380	920	30	443
Sample vol, l	0.0153	0.0120	0.0122	0.0132
Total ug	6	11	0.37	6

* Not detected, used 1/2 detection limit

COMPANY : BECHTEL PETROLEUM OPERATIONS, INC.
UNIT : K-36 LTS-1
DATE : 2-04-92
REPORT : 10-849A

Method 430

Acetaldehyde Results

FIELD BLANK

Test Run	#1 *	#2 *	#3 *	AVERAGE
ug/l	60	60	60	60
Sample vol, l	0.0153	0.0120	0.0122	0.0132
Total ug	0.92	0.72	0.73	0.79

*Not Detected, used 1/2 detection limit

COMPANY : BECHTEL PETROLEUM OPERATIONS, INC.
UNIT : K-36 LTS-1
DATE : 2-04-92
REPORT : 10-849A

Method 430

Acrolein Results

FIELD BLANK

Test Run	#1	#2	#3 *	AVERAGE
ug/l	220	290	60	190
Sample vol, l	0.0153	0.0120	0.0122	0.0132
Total ug	3.4	3.5	0.73	2.5

*Not Detected, used 1/2 detection limit

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Terry Rowles
Petro Chem Environmental
3207 Antonino Ave.
Bakersfield, CA 93308

Project: Bechtel K-36 LTS-1

Lab number: I0515
Date received: 02/07/92
Date sampled: 02/04/92
Sampled by: Mark Ready
Date extracted: 02/13/92
Extracted by: Mark Diehl
Date analyzed: 02/25/92
Analyzed by: Mark Diehl

Lab number: I0515-7 Sample Description: Run 1, impingers #1 & #2
QC ID: IB13IMP

	Formaldehyde		Acetaldehyde		Acrolein	
	Total ug	ug/L	Total ug	ug/L	Total ug	ug/L
PQL*	1.	60.	2.	120.	2.	120.
Corrected Result	230.	14000.	ND	ND.	10.**	850.**
Result	240.	14000.	ND.	ND.	ND.	ND.
Average Field Blank	6.	430.	ND.	ND.	2.	170.
Sample/Blank Ratio	40.0	32.6	N/A	N/A	<1	<1
Volume (combined impingers)		17.2 mL				

Sample Description: Matrix spike of I0515-7, Run 1, Impinger #1
QC ID: IB13IMP Spiked with: 5 ug or 0.55 ug/L of Formaldehyde

	Total ug	ug/L
PQL*	1.	60.
Result	140.	15000.
Original Result	240.	14000.
Percent recovery***	0	50
Volume (split from I0515-7A)		9.1 mL

Lab Certifications: CAELAP#1598, NYELAP#11177, UTELAP#E-142, AALA#0136-01.
*Results listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit). Results listed as N/A have calculations that are not applicable.
Corrected result is listed as the average field blank subtracted from the result, unless denoted by **.
**Corrected result is listed as the reporting limit (5.0 multiplied by the average field blank) according to CARB 430, section 11.9.
***Matrix spike was spiked too low for accurate quantitation. Differences in percent recoveries are due to different impinger volumes.

Respectfully submitted,
COAST TO COAST ANALYTICAL SERVICES

Mary Havlicek

Mary Havlicek, Ph.D.
President

03/02/92
HPLC 0225-16
IB13FORM
FORM1,1992

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Terry Rowles
Petro Chem Environmental
3207 Antonino Ave.
Bakersfield, CA 93308

Project: Bechtel K-36 LTS-1

Lab number: I0515
Date received: 02/07/92
Date sampled: 02/04/92
Sampled by: Mark Ready
Date extracted: 02/13/92
Extracted by: Mark Diehl
Date analyzed: 02/25/92
Analyzed by: Mark Diehl

Lab number: I0515-8 Sample Description: Run 2, impingers #1 & #2
QC ID: IB13IMP

	Formaldehyde		Acetaldehyde		Acrolein	
	Total ug	ug/L	Total ug	ug/L	Total ug	ug/L
PQL*	1.	60.	2.	120.	2.	120.
Corrected Result	490.	20000.	10.	400.	10.**	850.**
Result	500.	20000.	10.	400.	ND.	ND.
Average Field Blank	6.	430.	ND.	ND.	2.	170.
Sample/Blank Ratio	83.3	46.5	10.	400.	<1	<1
Volume (combined impingers)		24.7 mL				

Lab number: I0515-9 Sample Description: Run 3, impingers #1 & #2
QC ID: IB13IMP

	Formaldehyde		Acetaldehyde		Acrolein	
	Total ug	ug/L	Total ug	ug/L	Total ug	ug/L
PQL*	1.	60.	2.	120.	2.	120.
Corrected Result**	240.	9400.	62.	2600	10.**	850.**
Result	250.	10000.	62.	2600.	4.	160.
Average Field Blank	6.	430.	ND.	ND.	2.	170.
Sample/Blank Ratio	41.7	23.3	N/A	N/A	2.0	0.94
Volume (combined impingers)		24.3 mL				

Lab Certifications: CAELAP#1598, NYELAP#11177, UTELAP#E-142, AALA#0136-01.
*Results listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit).
Results listed as N/A have calculations that are not applicable.
Corrected result is listed as the average field blank subtracted from the result, unless denoted by **.
**Corrected result is listed as the reporting limit (5.0 multiplied by the average field blank) according to CARB 430, section 11.9.

03/02/92
HPLC 0225-17
IB13FORM
FORM1,1992

Respectfully submitted,
COAST TO COAST ANALYTICAL SERVICES

Mary Havlicek

Mary Havlicek, Ph.D.
President

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Terry Rowles
Petro Chem Environmental
3207 Antonino Ave.
Bakersfield, CA 93308

Project: Bechtel K-36 LTS-1

Lab number: I0515
Date received: 02/07/92
Date sampled: 02/04/92
Sampled by: Mark Ready
Date extracted: 02/13/92
Extracted by: Mark Diehl
Date analyzed: 02/25/92
Analyzed by: Mark Diehl

Lab number: I0515-4 Sample Description: Blank #1 DNPH
QC ID: IB13IMP

	Formaldehyde		Acetaldehyde		Acrolein	
	Total ug	ug/L	Total ug	ug/L	Total ug	ug/L
PQL*	1.	60.	2.	120.	2.	120.
Result	6.	380.	ND.	ND.	3.	220.
Volume	15.3 mL					

Lab number: I0515-5 Sample Description: Blank #2 DNPH
QC ID: IB13IMP

	Formaldehyde		Acetaldehyde		Acrolein	
	Total ug	ug/L	Total ug	ug/L	Total ug	ug/L
PQL*	1.	60.	2.	120.	2.	120.
Result	11.	920.	ND.	ND.	4.	290.
Volume	12.0 mL					

Lab number: I0515-6 Sample Description: Blank #3 DNPH
QC ID: IB13IMP

	Formaldehyde		Acetaldehyde		Acrolein	
	Total ug	ug/L	Total ug	ug/L	Total ug	ug/L
PQL*	1.	60.	2.	120.	2.	120.
Result	ND.	ND.	ND.	ND.	ND.	ND.
Volume	12.2 mL					

Average Field Blank	6.	430.	ND.	ND.	2.	170.

Lab Certifications: CAELAP#1598, NYELAP#11177, UTELAP#E-142, AALA#0136-01.
*Results listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit).

03/02/92
HPLC 0225-11
IB13FORM
FORM1,1992

Respectfully submitted,
COAST TO COAST ANALYTICAL SERVICES

Mary Havlicek, Ph.D.
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Terry Rowles
Petro Chem Environmental
3207 Antonino Ave.
Bakersfield, CA 93308

QC Batch ID: IB13form
Date extracted: 02/13/92
Extracted by: MD
Date analyzed: 02/20/92
Analyzed by: MD
Method: CARB 430

LABORATORY QC SPIKES AND BLANKS
FORMALDEHYDE

	Spike amount		Result		% Recovery
	Total ug	ug/L	Total ug	ug/L	
Spike 1	10	1000	9.6	960	96
Spike 2	10	1000	8.0	800	80
Spike 3	5.0	500	3.8	760	76
Spike 4**	5.0	500	1.3	130	26
Reagent blank	NS	NS	1.1	110	

Formaldehyde
Practical Quantitation Limit: 60 ug/L
Response factor: 2 ng/mm
Average % recovery: 84
Standard deviation of % rec: 11
Relative standard deviation of % rec: 13

Lab Certifications: CAELAP#1598, NYELAP#11177, UTELAP#E-142, AALA#0136-01.
*Results listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit).
**Spike result was not used in statistical calculations. A gross error was suspected.

03/02/92
IB13FORM
FORM1,1992

Respectfully submitted,
COAST TO COAST ANALYTICAL SERVICES

Mary Havlicek

Mary Havlicek, Ph.D.
President
Petro Chem Environmental Services, Inc.

CARB METHOD 410A WITH ANALYSIS BY GCMS
BENZENE, TOLUENE, XYLENE, ETHYL BENZENE, & PROPYLENE
(BTXE&P)

METHOD 410A SAMPLING AND ANALYSIS

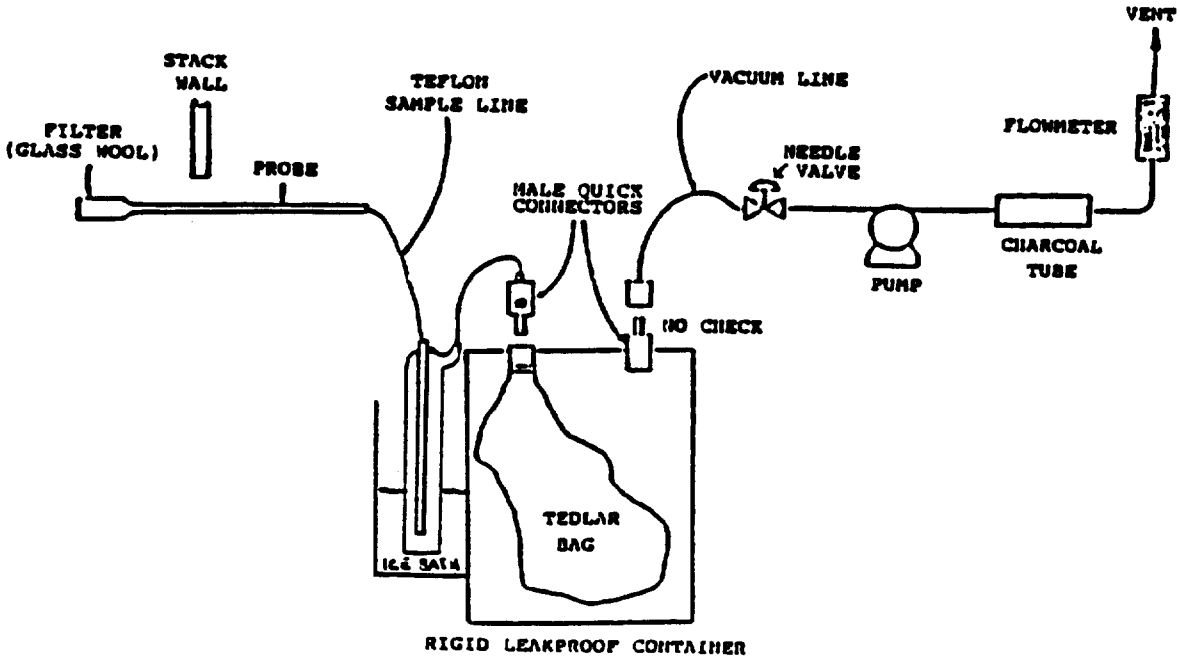
The sampling apparatus consisted of a heat traced stainless steel probe, teflon sample line, midget impinger moisture knockout, and a twenty liter tedlar bag housed in a rigid air tight container. The container was connected to a vacuum pump/rotameter/dry gas meter assembly.

The sampling apparatus was transported to the sample site and set up and leak tested by observing a zero reading on the rotameter. The sample probe/teflon line was purged with stack gas and the teflon stopcock of the midget impinger was open to initiate sampling. Sampling was conducted over a twenty minute period, a final leak test was performed and the bag was recovered from the sample container. The contents of the impinger and distilled water rinsings were recovered into a villi vial; the vial was completely filled.

The samples were stored out of sunlight, packaged and sent to the analytical laboratory. The bag sample was analyzed within 72 hours of sampling by EPA Method TO-14, GCMS. The condensate sample was analyzed within 7 days of sampling by EPA Method 8260 GCMS.

A bag blank (zero grade nitrogen) and condensable blank (distilled water) were included with each sample set. The results of the field blank were reported as ug/cm assuming that a sample volume (average of stack sample) was pulled the sample system.

Sampling Diagram



Petro Chem Environmental Services, Inc.

CARB METHOD 422.102 SAMPLING AND ANALYSIS

The sampling apparatus consisted of a heated quartz probe followed immediately by a double midget impinger system containing 0.1N NaOH in the first impinger and distilled water in the second impinger. The purpose of the impinger system is to remove acid gasses from the sample stream which can potentially react with 1,3-butadiene. The impinger system was followed by a 1/4 inch teflon line tee-ed into a Photovac GC/PID analyzer. A low flow vacuum pump/rotameter assembly was located downstream of the Photovac and provided continuous flow of sample past the Photovac.

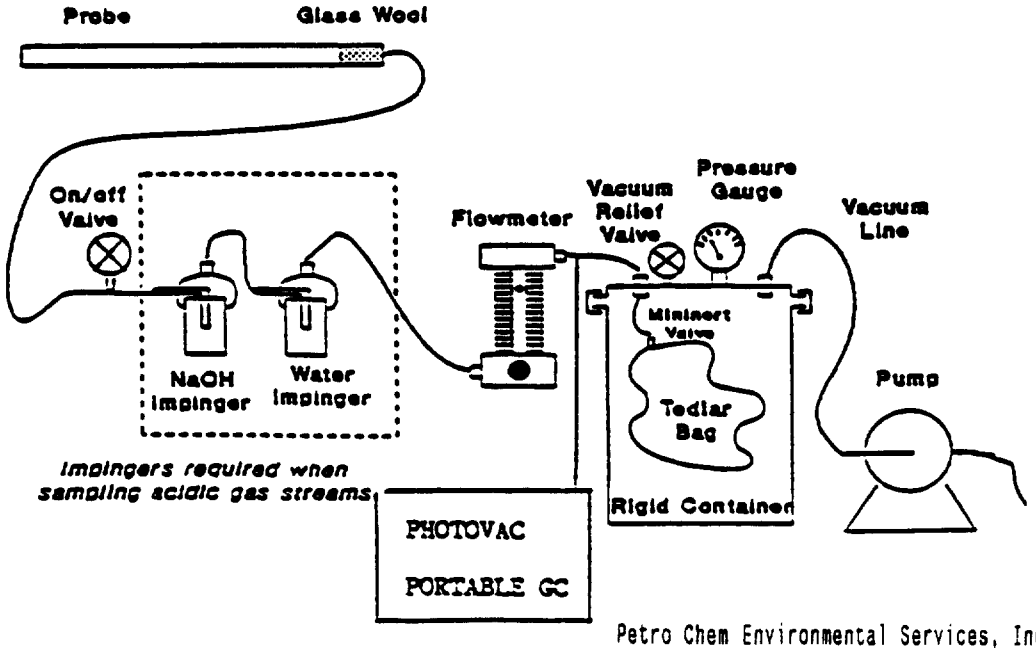
Prior to sampling the Photovac was calibrated with a known standard and the calibration was confirmed to be within the requirements when compared to the initial in-house calibration curves. The standard which was used was a mid point (with respect to the instrument range) standard or as close to the anticipated stack gas concentration as possible. If, after sampling, it was determined that another range was more applicable than the instrument was recalibrated in the new range.

Zero grade nitrogen was purged through the sample system and then analyzed as a field blank check. A known standard was purged through the sample system and analyzed as a system bias or spike check. The value was compared to the initial in-house calibration.

A minimum of three stack samples were analyzed. Upon completion of stack analysis a final field calibration was performed to confirm non instrument drift.

All data was compared to the in-house linear regression calibration curves and calculated as ppb 1,3-butadiene. A separate linear regression curve was performed for each range in which the Photovac was operated.

Sampling Diagram



Petro Chem Environmental Services, Inc.

FORMULAS

1,3-Butadiene

AVERAGE

$$\bar{x} = \frac{\sum_{i=1}^{n} x_i}{n}$$

STANDARD DEVIATION

$$s = \sqrt{\frac{\sum_{i=1}^{n} (x_i - \bar{x})^2}{n-1}}$$

RELATIVE STANDARD DEVIATION

$$RSD\text{-}\% = \frac{s}{\bar{x}} \times 100$$

RESPONSE FACTOR

$$RF = \frac{area}{concentration}$$

CORRELATION COEFFICIENT

$$R = \sqrt{R^2}$$

REGRESSION LINE EQUATION

$$\bar{y} = C + bx$$

GAS DILUTION CONCENTRATION CALCULATION

$$\frac{a}{a + b} \times c = d$$

Where:

a = Flow setting of calibration gas
b = Flow setting of dilution gas
c = Concentration of calibration gas
d = Concentration of new gas blend

CARB METHOD 429 SAMPLING

The sampling apparatus consisted of a quartz nozzle, heat traced quartz probe, heated borosilicate filter holder with a teflon-coated screen filter support, a teflon filter to condenser line, XAD-2 resin trap, and five modified Greenburg Smith impingers with the following contents: empty, 100 ml DI H_2O, 100 ml DI H_2O, dry, and silica gel. Pitot tubes and a stack gas thermocouple were attached adjacent to the sample probe.

Prior to the testing all sampling equipment was cleaned with successive rinses of soapy water, tap water, chromic acid, distilled water, methanol, hexane, and methylene chloride. All sample containers were new and pre-cleaned by rinsing with methanol, hexane, and methylene chloride. All chemicals used were reagent grade the distilled water was predistilled in glass.

The sample filters and resin traps were transported to the analytical laboratory for cleaning. The filters were extracted and the extract was analyzed to confirm non contamination. The resin trap was cleaned, charged with pre-cleaned XAD-2 resin and spiked with radio-labeled surrogate standards.

The sample train was charged; a pre-cleaned Whatman QMA Quartz fiber filter was placed into the filter holder, the probe/nozzle/filter was put together, all sampling equipment was sealed with hexane rinsed foil and transported to the stack for assembly.

The sampling equipment was assembled and leak tested at 15 inches Hg vacuum. The probe and filter components were heated to 250 (± 25 °F). The probe was inserted into the stack and isokinetic sampling was initiated as per EPA Method #5.

Triplicate test runs were performed all lasting a minimum of 180 minutes. Upon completion of a test the probe was withdrawn from the stack and leak tested at a vacuum equal to or greater than the maximum vacuum observed during the test. The equipment was then disassembled and the components were then sealed with hexane rinsed aluminum foil and transported to the mobile laboratory for sample recovery.

A field blank was similarly treated: charged, transported to the stack, leak tested, disassembled, and transported to the mobile laboratory for sample recovery. No additional gases were pulled through the field blank train.

SAMPLE RECOVERY AND ANALYSIS

The filter and nozzle were separated from the probe. The probe was tilted and rotated while brushing three successive times and rinsing with methanol, hexane, and methylene chloride. Sterile surgical gloves were used during this process. All rinses were caught in an amber glass sample bottle. The nozzle, and filter top half were then similarly cleaned and the rinsings were combined with the probe wash.

The filter back-half, impinger line and condenser were similarly cleaned and the combined rinsings were recovered into an amber glass sample bottle.

The filter was removed from the filter holder with teflon coated forceps, folded and wrapped in hexane rinsed aluminum foil, placed into a petri dish and sealed with teflon tape.

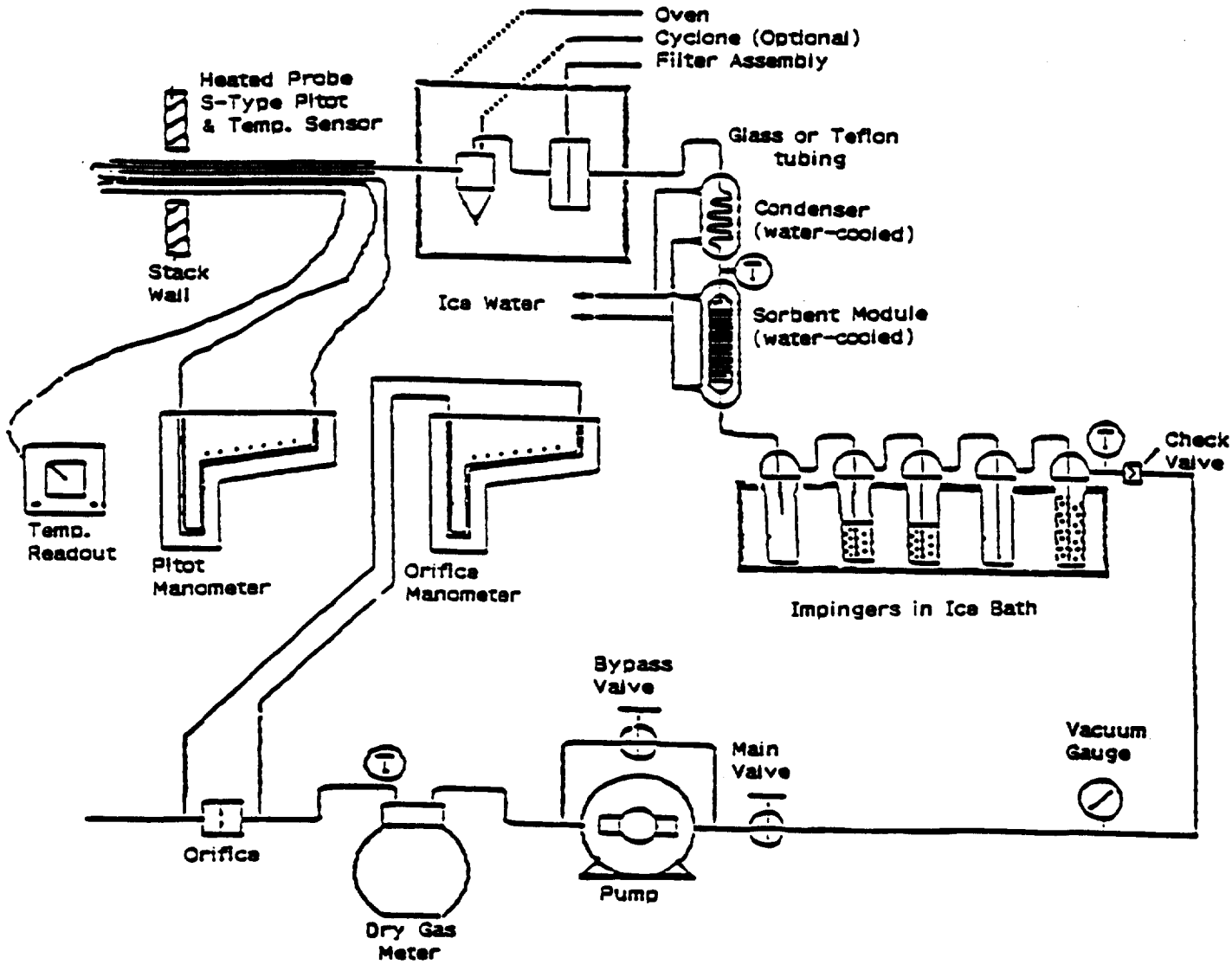
All impingers were disassembled and weighed. The contents of the first impinger were transferred to an amber sample bottle. The impinger was rinsed three times each with methanol, hexane, and methylene chloride. The rinsings were combined with the impinger contents.

The second, third, and fourth impinger contents were transferred to one or more amber glass sample bottles. These impingers and crossovers were each rinsed three times with distilled water and the rinsings were combined with the impinger contents.

Aliquots of the reagents grade chemicals and filters were recovered for analysis as reagent blanks. All samples were sealed, fluid levels marked, labeled, and logged on a chain of custody form. The samples were placed in a shipping container. All liquid samples were stored under blue ice. All filter samples were stored under dry ice.

The samples were transported to the laboratory for analysis where they were logged and inspected for abnormalities. Each sample fraction underwent an extraction and concentration. The extracts were combined and further concentrated. The final concentrate was analyzed by high resolution GCMS (HRGCMS) for all listed PAH compounds. If necessary the sample was diluted to a larger volume and reanalyzed for those PAH compounds which saturated the detector due to high concentration.

CARB Method 429
PAH SAMPLING TRAIN



Filter - Whatman QMA Quartz on Teflon Screen Support
Imp. #1 - Dry
Imp. #2 - 100 mls Distilled Water
Imp. #3 - 100 mls Distilled Water
Imp. #4 - Dry
Imp. #5 - Indicating Silica Gel

CARB METHOD 430
ALDEHYDES

SAMPLE RECOVERY AND ANALYSIS

The sampling apparatus consisted of a heated quartz probe, followed by three midget impingers containing 10 ml of acidified DNPH in the first two and silica gel in the third. The impinger train was connected to a vacuum pump/rotameter/dry gas meter assembly. Prior to the test, the impingers was cleaned with chromic acid, distilled water, methylene chloride, methanol, and oven dried. The impinger bottoms were then sent to the analytical laboratory for charging. The impinger bottoms were charged, capped, and returned to PCES for sampling within a 48 hour period of making the DNPH solution.

The charged impinger bottoms were stored in a friction top can with 1-2 inches of activated charcoal and shipped to the sample location. The impingers were then uncapped, the impinger tops added, and then the sampling train was assembled. The train was transported to the stack and leak tested by closing the teflon stopcock at the first impinger while applying the vacuum to the system. The stopcock was then opened and sampling proceeded at a sample rate of 0.5 L/min. (.018 CFM). Upon completion of the test, the train was leak tested again, and a 2 ml DNPH/ 1 ml H_2O probe wash will be performed and allowed to drain into the first impinger. The train was then disconnected from the probe and lowered down to the mobile laboratory where the impinger tops were removed; impingers were capped and sealed with teflon tape, labeled and placed back into the friction top can with activated charcoal. The samples were then shipped back to the analytical laboratory for extraction and analysis of aldehydes by CARB Method 430, HPLC.

Three field blank impingers were similarly treated however, no gas was sampled through them. A sample spike was performed by the analytical laboratory by dividing a stack sample in half and performing a matrix spike on one half.

$$DSCF = V_{m(std)}$$

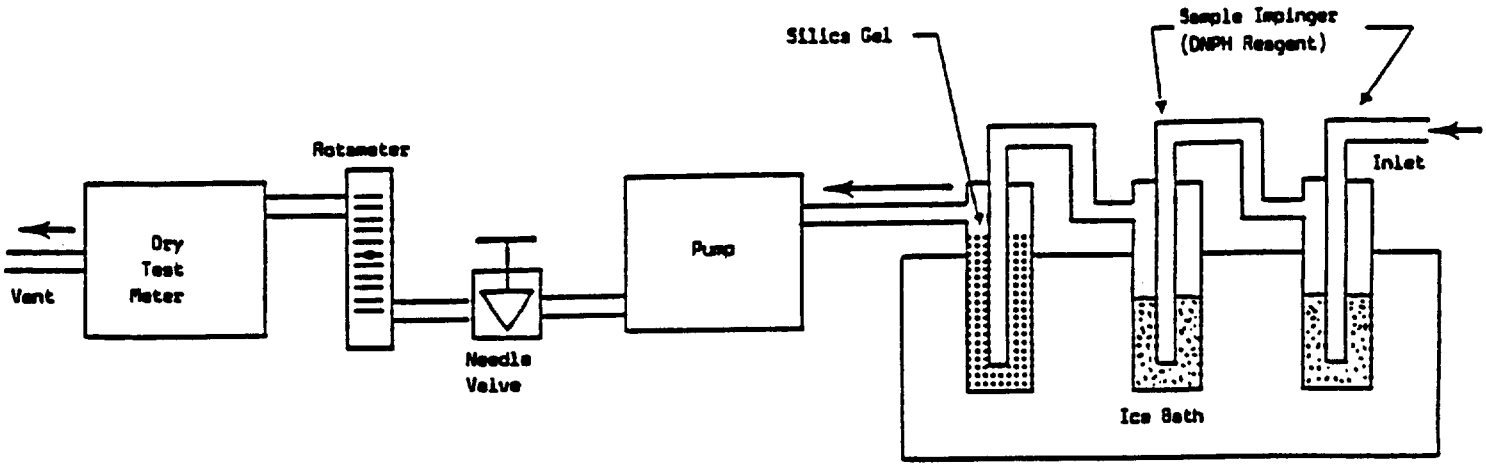
$$DSCM = DSCF \times .0283$$

$$PPb = \frac{(DSCM \times 24.40985)}{MW}$$

$$\frac{LBS}{HR} = \frac{PPb \times MW \times DSCFM \times 1.581 \times 10^{-3}}{1000}$$

CARB METHOD 430
ALDEHYDES
(con't)

Sampling Diagram



PETRO CHEM ENVIRONMENTAL SERVICES, INC.

DRY GAS METER CALIBRATION

DATE:	1-29-92	AMBIENT TEMP (°F):	46
TECH:	BDM	BAROMETRIC Pbar:	29.74
		TEST METER ID#:	S5M104564
METER I.D.#	1001	TEST METER Mcf:	1.015

APPROXIMATE CFM		1.00	0.75	0.50	0.30
STD TEST METER VOLUME CF	INITIAL	0.00	0.00	0.00	0.00
	FINAL	10.05	7.34	10.01	10.01
	TOTAL	10.05	7.34	10.01	10.01
FIELD GAS METER VOLUME CF	INITIAL	805.50	819.90	828.40	839.80
	FINAL	815.52	827.37	838.81	850.26
	TOTAL	10.02	7.47	10.41	10.46
STD TEST METER TEMP (°F)		46.0	49.0	46.5	53.0
FIELD GAS METER TEMP (°F)	IN	51.0	52.0	53.5	53.0
	OUT	36.0	39.0	44.0	49.0
	AVERAGE	43.5	45.5	48.8	51.0
STD TEST METER PRESSURE ("H2O)		-1.30	-0.80	-0.30	-0.15
FIELD GAS METER PRESSURE ("H2O)		2.33	1.29	0.52	0.20
FIELD GAS METER, Mcf		1.007207	0.967329	0.979076	0.967069

FIELD AVERAGE Mcf:	0.985170	H@:	1.3081

PETRO CHEM ENVIRONMENTAL SERVICES, INC.

DRY GAS METER CALIBRATION

DATE:	3-18-92	AMBIENT TEMP (°F):	59
TECH:	BDM	BAROMETRIC Pbar:	30
		TEST METER ID#:	S5M104564
METER I.D.#	1001	TEST METER Mcf:	1.015

APPROXIMATE CFM		1.00	0.75	0.50	0.30
STD TEST METER VOLUME CF	INITIAL	0.00	0.00	0.00	0.00
	FINAL	10.06	7.31	10.14	10.01
	TOTAL	10.06	7.31	10.14	10.01
FIELD GAS METER VOLUME CF	INITIAL	648.00	638.40	659.10	670.30
	FINAL	658.20	645.82	669.58	680.76
	TOTAL	10.20	7.42	10.48	10.46
STD TEST METER TEMP (°F)		57.5	57.0	57.5	60.0
FIELD GAS METER TEMP (°F)	IN	61.0	58.5	62.5	65.0
	OUT	49.5	51.5	55.5	60.0
	AVERAGE	55.3	55.0	59.0	62.5
STD TEST METER PRESSURE ("H2O)		-1.30	-0.60	-0.30	-0.15
FIELD GAS METER PRESSURE ("H2O)		2.30	1.25	0.51	0.20
FIELD GAS METER, Mcf		0.991129	0.993042	0.983688	0.975525

FIELD AVERAGE Mcf:	0.985846	H@:	1.2829

Petro Chem Environmental Services, Inc.

Method 430
Pretest Rotameter Calibration

FLOW ROTAMETER CALIBRATION

ROTAMETER # 01
DATE: 1-31-92
Pbar 29.56 "Hg

	ROTAMETER SETTING	TEMP °F	VOLUME ml	TIME sec	RATE L/min
5 a	5.00	68.00	500.00	59.81	0.50
b	5.00	68.00	500.00	60.52	0.50
c	5.00	68.00	500.00	60.88	0.49
AVG	5.00	68.00	500.00	60.40	0.50
4 a	4.00	68.00	500.00	79.71	0.38
b	4.00	68.00	500.00	79.22	0.38
c	4.00	68.00	500.00	79.53	0.38
AVG	4.00	68.00	500.00	79.47	0.38
3 a	3.00	68.00	500.00	105.56	0.28
b	3.00	68.00	500.00	105.01	0.29
c	3.00	68.00	500.00	104.75	0.29
AVG	3.00	68.00	500.00	105.29	0.29
2 a	2.00	68.00	500.00	158.09	0.19
b	2.00	68.00	500.00	157.88	0.19
c	2.00	68.00	500.00	158.30	0.19
AVG	2.00	68.00	500.00	157.99	0.19

Method 430
Post test Rotameter Calibration

FLOW ROTAMETER CALIBRATION

ROTAMETER # 01
DATE: 2-18-92
Pbar 29.39 "Hg

	ROTAMETER SETTING	TEMP °F	VOLUME ml	TIME sec	RATE L/min
5 a	5.00	82.00	500.00	59.76	0.50
b	5.00	82.00	500.00	61.12	0.49
c	5.00	82.00	500.00	60.96	0.49
AVG	5.00	82.00	500.00	60.61	0.49
4 a	4.00	82.00	500.00	79.68	0.38
b	4.00	82.00	500.00	79.00	0.38
c	4.00	82.00	500.00	79.20	0.38
AVG	4.00	82.00	500.00	79.34	0.38
3 a	3.00	82.00	500.00	105.40	0.28
b	3.00	82.00	500.00	105.12	0.29
c	3.00	82.00	500.00	104.84	0.29
AVG	3.50	82.00	500.00	105.26	0.29
2 a	2.00	82.00	500.00	158.12	0.19
b	2.00	82.00	500.00	157.92	0.19
c	2.00	82.00	500.00	158.48	0.19
AVG	2.00	82.00	500.00	158.02	0.19

CHAIN OF CUSTODY RECORD

Submitted to: ALTA LABS

ANALYSIS REQUEST

COMPANY	LOCATION/UNIT
BECHTEL	K-36 LTS-1

REPORT NO.	SAMPLER
10-849A	MARK T. READY

METHOD	REPORT ATTN.	PO#
429 - PAH -	TERRY ROWLES	

Sample No./ID	Sample Description	Sample Date	Liq.	Filter	Gas	HRGCMS FOR ALL LISTED METHOD 429 PAH					
A-100	FILTER BLANK	2-3-92		X							
A-101	PROBE & NOZZLE BLANK	"	X								
A-102	CONDENSER RINSE BLANK	"	X			COMPOSITE					
A-103	FIRST IMPINGER BLANK	"	X								
A-104	SECOND IMPINGER BLANK	"	X								
A-105	RESIN TRAP BLANK (TRAP #12)	"		X							
~~A-106~~	~~HEXANE BLANK~~	"	X								
~~A-107~~	~~METHANOL BLANK~~	"	X								
~~A-108~~	~~$MeCl_2$ BLANK~~	"	X								
~~A-109~~	~~DIST H_2O BLANK~~	"	X								

COMMENTS:

ANALYZE WITHIN 7 DAYS OF COLLECTION

RELINQUISHED BY:	DATE	RECEIVED BY:	DATE
Mark Ready	2-3-92	Kenneth J. FLATT	2-8-92
RELINQUISHED BY:	DATE	RECEIVED BY:	DATE
RELINQUISHED BY:	DATE	RECEIVED BY:	DATE

PETRO CHEM ENVIRONMENTAL SERVICES, INC.
3207 Antonino Avenue, Bakersfield, CA 93308
(805) 327-7300 FAX (805) 327-3459

CHAIN OF CUSTODY RECORD

Submitted to: ALTA LABS

ANALYSIS REQUEST

COMPANY	LOCATION/UNIT
BECHTEL	K-36 LTS-1

REPORT NO.	SAMPLER
10-849A	MARK T. READY

METHOD	REPORT ATTN.	PO#
429 - PAH -	TERRY Rowles	

Sample No./ID	Sample Description	Sample Date	Liq.	Filter	Gas	HRGCMS FOR ALL LISTED METHOD 429 PAH
A-1	FILTER #1	2-4-92		X		
A-2	PROBE & NOZZLE #1	"	X			
A-3	CONDENSER RINSE #1	"	X			
A-4	FIRST IMPINGER #1	"	X			COMPOSITE
A-5	SECOND IMPINGER #1	"	X			
A-6	RESIN TRAP #1 (TRAP # 8)	"		X		
A-7	FILTER #2	2-4-92		X		
A-8	PROBE & NOZZLE #2	"	X			
A-9	CONDENSER RINSE #2	"	X			COMPOSITE
A-10	FIRST IMPINGER #2	"	X			
A-11	SECOND IMPINGER #2	"	X			
A-12	RESIN TRAP #2 (TRAP #)	"		X		

COMMENTS:

ANALYZE WITHIN 7 DAYS OF COLLECTION

RELINQUISHED BY:	DATE	RECEIVED BY:	DATE
Mark Ready	2-4-92	[illegible] 2-8-92	2-8-92
RELINQUISHED BY:	DATE	RECEIVED BY:	DATE
RELINQUISHED BY:	DATE	RECEIVED BY:	DATE

PETRO CHEM ENVIRONMENTAL SERVICES, INC.
3207 Antonino Avenue, Bakersfield, CA 93308
(805) 327-7300 FAX (805) 327-3459

CHAIN OF CUSTODY RECORD

Submitted to: ALTA LABS

ANALYSIS REQUEST

COMPANY	LOCATION/UNIT
BECHTEL	K-36 LTS-1
REPORT NO.	**SAMPLER**
10-849A	MARK T. READY
METHOD	**REPORT ATTN.** / **PO#**
429 - PAH -	TERRY ROWLES

Sample No./ID	Sample Description	Sample Date	Liq.	Filter	Gas	HRGCMS for all listed Method 429 PAH
A-13	FILTER #3	2-5-92		X		COMPOSITE
A-14	PROBE & NOZZLE #3	"	X			
A-15	CONDENSER RINSE #3	"	X			
A-16	FIRST IMPINGER #3	"	X			
A-17	SECOND IMPINGER #3	"	X			
A-18	RESIN TRAP #3 (TRAP # 9)	"		X		

COMMENTS:

Analyze within 7 days of collection

RELINQUISHED BY:	DATE	RECEIVED BY:	DATE
Mark Ready	2-5-92	Kenneth [illegible]	2-8-92
RELINQUISHED BY:	DATE	RECEIVED BY:	DATE
RELINQUISHED BY:	DATE	RECEIVED BY:	DATE

PETRO CHEM ENVIRONMENTAL SERVICES, INC.
3207 Antonino Avenue, Bakersfield, CA 93308
(805) 327-7300 FAX (805) 327-3459

CHAIN OF CUSTODY RECORD

Submitted to: COAST TO COAST

ANALYSIS REQUEST

COMPANY	LOCATION/UNIT
BECHTEL	K-36 LTS-1
REPORT NO. 10-849A	SAMPLER MARK T. READY
METHOD 430 - FORMALDEHYDE	REPORT ATTN. TERRY Rowles / PO# 1772

Sample No./ID	Sample Description	Sample Date	Liq.	Filter	Gas	FORMALDEHYDE PQL = 50 µg/L	ACETALDEHYDE PQL = 100 µg/L	ACROLEIN PQL = 100 µg/L	FORMALDEHYDE PQL = 50 µg/L	ACETALDEHYDE PQL = 100 µg/L	ACROLEIN PQL = 100 µg/L
1	BLANK #1 DNPH	2-5-92	x			x	x	x			
2	BLANK #2 "	2-5-92	x			x	x	x			
3	BLANK #3 "	2-5-92	x			x	x	x			
4	Imp #1 Run #1 DNPH	"	x	composite					x	x	x
5	Imp #2 RUN #1 "	"	x								
6	Imp #1 RUN #2 "	"	x	composite					x	x	x
7	Imp #2 RUN #2 "	"	x								
8	Imp #1 RUN #3 "	"	x	composite					x	x	x
9	Imp #2 RUN #3 "	"	x								
	* Perform matrix spike										
	on 1/2 of sample										
	8/a composite										

COMMENTS:
for blanks extract + analyze within 24hrs, Report µg/li
for Samples extract + analyze within 7days, Report µg/li & total µg

RELINQUISHED BY:	DATE	RECEIVED BY:	DATE
Mark Ready	2-5-92		2-5-92
RELINQUISHED BY:	DATE	RECEIVED BY:	DATE
	2-6-92		
RELINQUISHED BY:	DATE	RECEIVED BY:	DATE

PETRO CHEM ENVIRONMENTAL SERVICES, INC.
3207 Antonino Avenue, Bakersfield, CA 93308
(805) 327-7300 FAX (805) 327-3459

PO# 1772

CHAIN OF CUSTODY RECORD

Submitted to: COAST TO COAST

I0515

ANALYSIS REQUEST

COMPANY	LOCATION/UNIT
BECHTEL	K-36 LTS-1
REPORT NO. 10-849A	SAMPLER MARK T. READY
METHOD 430 - FORMALDEHYDE	REPORT ATTN. TERRY ROWLES / PO#

Sample No./ID	Sample Description	Sample Date	Liq.	Filter	Gas	FORMALDEHYDE PQL = 50 µg/L	ACETALDEHYDE PQL = 100 µg/L	ACROLEIN PQL = 100 µg/L	FORMALDEHYDE PQL = 50 µg/L	ACETALDEHYDE PQL = 100 µg/L	ACROLEIN PQL = 100 µg/L	
1	BLANK #1 DNPH	2-5-92	x			x	x	x				-4
2	BLANK #2 "	2-5-92	x			x	x	x				-5
3	BLANK #3 "	2-5-92	x			x	x	x				-6
4	Imp #1 Run #1 DNPH	"	x	composite					x	x	x	-7
5	Imp #2 Run #1 "	"	x									
6	Imp #1 Run #2 "	"	x	composite					x	x	x	-8
7	Imp #2 Run #2 "	"	x									
8	Imp #1 Run #3 "	"	x	composite					x	x	x	-9
9	Imp #2 Run #3 "	"	x									
	* Perform matrix spike											
	on 1/2 of sample											
	8/9 composite											

COMMENTS:
for blanks extract + analyze within 24hrs, Report µg/L
for Samples extract + analyze within 7days, Report µg/L & total µg

RELINQUISHED BY:	DATE	RECEIVED BY:	DATE
Mark Ready	2-5-92	[illegible]	2-5-92
RELINQUISHED BY:	DATE	RECEIVED BY:	DATE
[illegible]	2-6-92	[illegible] 2-7-93 1145	
RELINQUISHED BY:	DATE	RECEIVED BY:	DATE

PETRO CHEM ENVIRONMENTAL SERVICES, INC.
3207 Antonino Avenue, Bakersfield, CA 93308
(805) 327-7300 FAX (805) 327-3459

CHAIN OF CUSTODY RECORD

Submitted to: Coast to Coast Analytical

PQL = .1 ppb

PQL = .01 µg

IC515

ANALYSIS REQUEST

COMPANY	LOCATION/UNIT
BECHTEL	K-36 - LTS-1
REPORT NO. 10-849A	SAMPLER MARK T. READY
METHOD 422 - VOA	REPORT ATTN. TERRY ROWLES / PO#

Sample No./ID	Sample Description	Sample Date	Liq.	Filter	Gas	Benzene, Toluene, Xylenes, Propane	Benzene, Toluene, Xylenes, Propane					
5	NON CONDENSABLE #1	2-4-92 11:35			X	X						-1
6	" #2	2-4-92 11:40			X	X						-2
7	" #3	2-4-92 11:45			X	X						-3

COMMENTS: Gas Analysis within 72 hrs report as ppb and µg/cm

Report within 21 days

RELINQUISHED BY:	DATE	RECEIVED BY:	DATE
Mark Ready	2-5-92	[illegible]	2/5/92
RELINQUISHED BY: [illegible]	DATE 2-6-92	RECEIVED BY: [illegible] 2-7-92 1045	DATE
RELINQUISHED BY:	DATE	RECEIVED BY:	DATE

PETRO CHEM ENVIRONMENTAL SERVICES, INC.
3207 Antonino Avenue, Bakersfield, CA 93308
(805) 327-7300 FAX (805) 327-3459

CHAIN OF CUSTODY RECORD

Submitted to: COAST TO COAST

COMPANY	LOCATION/UNIT	
BECHTEL	K-70 30R / K-36 LTS-1	
REPORT NO.	SAMPLER	
10-849A	MARK T. READY	
METHOD	REPORT ATTN.	PO#
VOA - 422	TERRY ROWLES	

ANALYSIS REQUEST: Benzene, Toluene, Xylene, Ethylbenzene, Propylene PQL = .1 PPB; Benzene, Toluene, Xylene, Ethylbenzene, Propylene PQL = .01 µg

	Sample No./ID	Sample Description	Sample Date	Liq.	Filter	Gas	TO 14	8240				
									I0525			
K-70 30R	10	Condensable #1	2-6-92	x				x		—	5	
	11	Condensable #2	"	x				x		—	6	
	12	Condensable #3	"	x				x		—	7	
	13	Condensable Blank	"	x				x		—	8	
	14	NonCondensable #1	"			x	x			—	1	
	15	Non Condensable #2	"			x	x			—	2	
	16	Non Condensable #3	"			x	x			—	3	
	17	Non Condensable Blank	"			x	x			—	4	
K36 LTS-1	2	Condensable #1	2-5-92	x				x		—	9	
	3	Condensable #2	"	x				x		—	10	
	4	Condensable #3	"	x				x		—	11	

COMMENTS: GAS ANALYSIS WITHIN 72 HRS REPORT AS PPB and µg/cm

REPORT WITHIN 21 DAYS

RELINQUISHED BY:	DATE	RECEIVED BY:	DATE
Mark Ready	2-6-92	Kellen Nielsen	2/8/92 1200
RELINQUISHED BY:	DATE	RECEIVED BY:	DATE
RELINQUISHED BY:	DATE	RECEIVED BY:	DATE

PETRO CHEM ENVIRONMENTAL SERVICES, INC.
3207 Antonino Avenue, Bakersfield, CA 93308
(805) 327-7300 FAX (805) 327-3459

DISCUSSION

CARB Method 429, PAH, requires that the filter samples be stored and shipped on dry ice. The samples were packed following the guidelines as stated in the method. Mark Ready supervised sample storage and shipping and verifies proper sample handling.

Mark T. Ready
March 26, 1992

ALTA Analytical Laboratory

Batch ID: 10995

Sample Log-In Checklist	Yes	No
1. Samples Arrived by: Federal Express		
2. Airbill Present? Number 9462230724	X	
3. Shipping Container is Intact?	X	
4. Custody Seals Present? Number _____		X
If yes, are they intact? N/A		
5. Sample Containers Intact?	X	
6. Shipping Preservation: Ice/Blue Ice/None		
7. Temperature: 6°C		
8. Chain of Custody Present?	X	
9. Discrepancies in Chain of Custody?		X
10. Packing Retained? Alta chest	X	

Name: [illegible] Date Rcv'd: 2-8-92

Comments:

ALTA Analytical Laboratory

Batch ID: 11005

Sample Log-In Checklist	Yes	No
1. Samples Arrived by: Federal Express		
2. Airbill Present? Number 9462229383	X	
3. Shipping Container is Intact?	X	
4. Custody Seals Present? Number _____		X
If yes, are they intact? N/A		
5. Sample Containers Intact?	X	
6. Shipping Preservation: Ice/Blue Ice/None		
7. Temperature: 6°C		
8. Chain of Custody Present?	X	
9. Discrepancies in Chain of Custody?		X
10. Packing Retained?	X	

Name: [illegible] Date Rcv'd: 2-12-92

Comments:

ALTA Analytical Laboratory

Batch ID: 11028

Sample Log-In Checklist	Yes	No
1. Samples Arrived by: Federal Express		
2. Airbill Present? Number 946 2231 925	X	
3. Shipping Container is Intact?	X	
4. Custody Seals Present? Number _____		X
If yes, are they intact? N/A		
5. Sample Containers Intact?	X	
6. Shipping Preservation: Ice/Blue Ice/None		
7. Temperature: 6°C		
8. Chain of Custody Present?	X	
9. Discrepancies in Chain of Custody?		X
10. Packing Retained?	X	

Name: [illegible] Date Rcv'd: 2-18-92

Comments:

Petro Chem Environmental Services, Inc.

ALTA Analytical Laboratory

Batch ID: 11028

Sample Log-In Checklist	Yes	No
1. Samples Arrived by: Federal Express		
2. Airbill Present? Number 9462231940	X	
3. Shipping Container is Intact?	X	
4. Custody Seals Present? Number _____		X
If yes, are they intact? N/A		
* 5. Sample Containers Intact?		X
6. Shipping Preservation: Ice/Blue Ice/None		
7. Temperature: 4°C		
8. Chain of Custody Present?	X	
9. Discrepancies in Chain of Custody?		X
10. Packing Retained? Alta Chest	X	

Name: [signature] Date Rcv'd: 2-18-92

Comments:

* The condenser rinse blank. Sample I.D. D-21 was received broken.

Petro Chem Environmental Services, Inc.

PETRO CHEM ENVIRONMENTAL SERVICES INC.

CALIFORNIA AIR RESOURCES BOARD

METHOD 422.102

ANALYSIS OF 1,3-BUTADIENE

INITIAL PERFORMANCE EVALUATION

1/24/92

INTRODUCTION

Analysis of four concentrations of 1,3-Butadiene was performed in triplicate according to California Air Resources Board method 422.199 part 4 "Calibration and Quality Control Procedures for Analysis Methods-Initial Performance Evaluation". Two of these standards were supplied by Scott Specialty Gasses. The other two standards were blended from the certified standards and ultra high purity nitrogen using a calibrated Charlton Technology Microblend model BC precision gas blender with mass flow controllers. A summary of certified gas concentrations, gas blender instrument settings and blended standard gas concentration calculations are included in this report.

All peak areas in the raw data section are in millivoltseconds (mVS) to allow larger numbers to be used in calculations. These units differ from those reported on the actual chromatograms which are in voltseconds (VS).

Linear regression was performed using the "least squares" regression analysis program found in the QUATTRO PRO spreadsheet program. In the regression output table the constant" equals the y intercept and R Squared is the square of the correlation coefficient.

All analysis and calculations were performed by Terry Rowles of Petro Chem Environmental Services Inc. All analysis for initial performance evaluation were performed on 1/24/92 using a PHOTOVAC model 10S55 gas chromatograph equipped with a photoionization detector. The columns used were (1) a 4" by 1/8" CSP 20M precolumn and (2) a 10M by .53mm KCL/Al2O3 analytical column. A backflush technique was used to remove interferences from the analytical system and to help isolate the compound of interest.

California Air Resources Board Method 422.102
1,3-Butadiene Initial Performance Evaluation

Summary of Results

Limit of Detection (LOD)	0.16ppbv
Limit of Quantitation (LOQ)	0.54ppbv
Correlation Coefficient	0.9996
Regression Formula	Y=-0.164+0.0023X

Method 422.102 1,3-Butadiene

Linear Regression Analysis

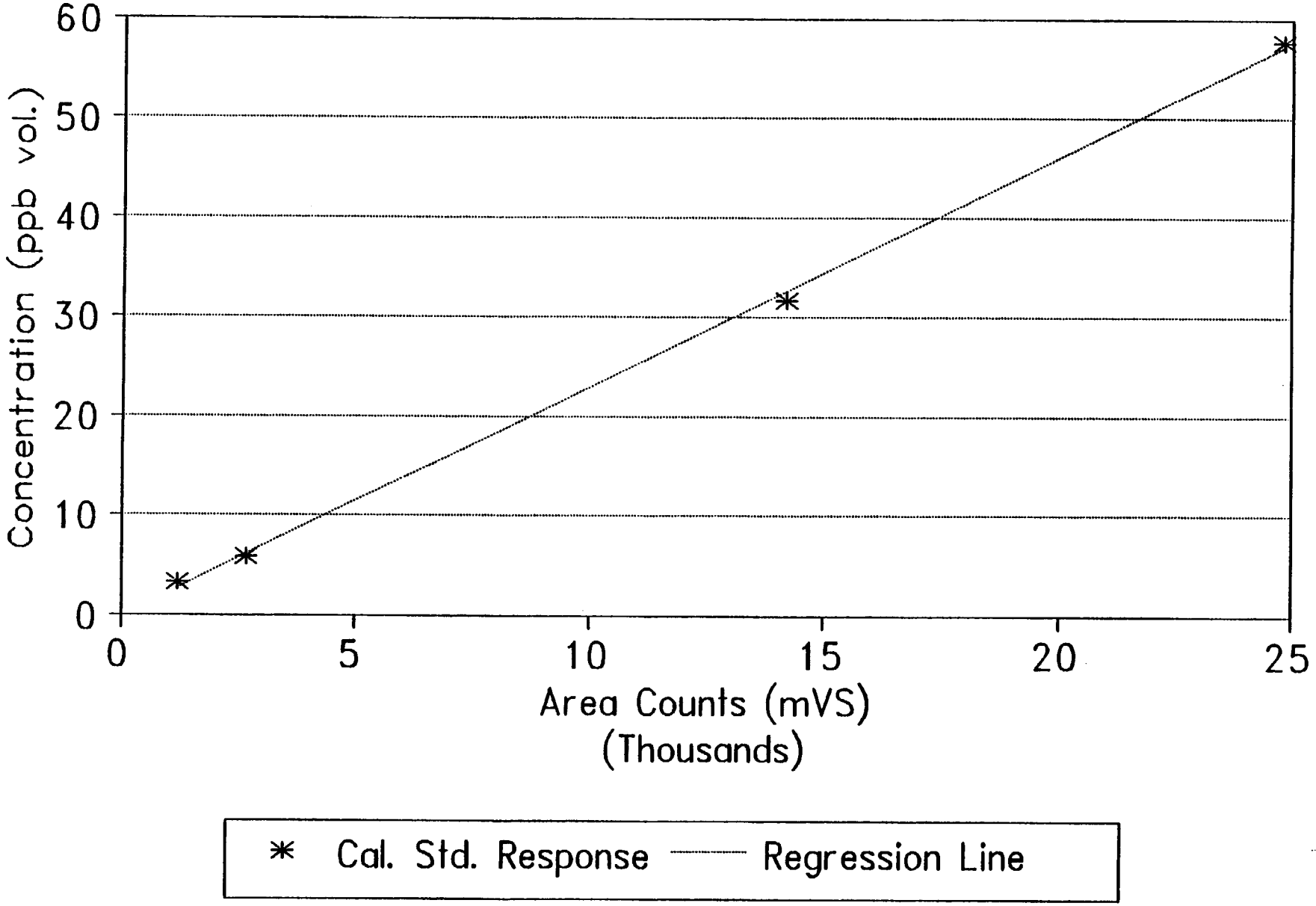
Regression Output:

Constant		-0.164061
Std Err of Y Est		0.6797652
R Squared		0.9992079
No. of Observations		4
Degrees of Freedom		2
X Coefficient(s)	0.0023091	
Std Err of Coef.	4.597E-05	

CONC.	REGR. CONC.
3.22	2.6068
5.86	6.0704
31.7	32.6248
57.7	57.1779

Linear Regression Graph

1, 3-Butadiene



PETRO CHEM ENVIRONMENTAL SERVICES INC.

California Air Resources Board Method 422.102
Chromatographic Analysis of 1,3-Butadiene from Stationary Sources

Initial Performance Evaluation
Raw Data and Response Factors

STANDARD CONCENTRATION (ppb v/v)	AREA RUN 1	AREA RUN 2	AREA RUN 3	AREA AVERAGE	AREA STANDARD DEVIATION
3.22	1200	1200	1200	1200.00	0.00
5.86	2700	2700	2700	2700.00	0.00
31.7	14300	14200	14100	14200.00	100.00
57.7	24800	24900	24800	24833.33	57.74

STANDARD CONCENTRATION (ppb v/v)	RESPONSE FACTOR RUN 1	RESPONSE FACTOR RUN 2	RESPONSE FACTOR RUN 3	RESPONSE FACTOR AVERAGE	RESPONSE FACTOR STANDARD DEVIATION
3.22	2.6833E-03	2.6833E-03	2.6833E-03	2.6833E-03	0.0000E+00
5.86	2.1704E-03	2.1704E-03	2.1704E-03	2.1704E-03	0.0000E+00
31.7	2.2168E-03	2.2324E-03	2.2482E-03	2.2325E-03	1.5722E-05
57.7	2.3266E-03	2.3173E-03	2.3266E-03	2.3235E-03	5.3947E-06
			RF AVG.=	2.3524E-03	
			RF STD.DEV.=	0.0002293962	
			RF RSD% =	9.75%	

Calibration Gas Source and Concentrations

Certified Gasses

Source	Concentration	Constituents	Certificate Date
Scott	5.86ppbv +/- 10%	1,3-Butadiene Nitrogen	1/16/92
Scott	57.7ppbv +/- 10%	1,3-Butadiene Nitrogen	1/16/92

Blended Gasses

Source	Concentration	Flow Rates (L/min.) Dilution Gas	Cal. Gas	Date Blended
5.86ppm UHP N2	3.22ppmv	0.9	1.1	1/24/92
57.7ppm UHP N2	31.7ppmv	0.9	1.1	1/24/92

FORMULAS

AVERAGE

$$\bar{x} = \frac{\sum_{i=1}^{n} x_i}{n}$$

STANDARD DEVIATION

$$s = \sqrt{\frac{\sum_{i=1}^{n} (x_i - \bar{x})^2}{n-1}}$$

RELATIVE STANDARD DEVIATION

$$RSD\,\% = \frac{s}{\bar{x}} \times 100$$

RESPONSE FACTOR

$$RF = \frac{area}{concentration}$$

CORRELATION COEFFICIENT

$$R = \sqrt{R^2}$$

REGRESSION LINE EQUATION

$$\bar{y} = C + bx$$

GAS DILUTION CONCENTRATION CALCULATION

$$\frac{a}{a + b} \times c = d$$

Where:

a = Flow setting of calibration gas
b = Flow setting of dilution gas
c = Concentration of calibration gas
d = Concentration of new gas blend

LIMIT OF DETECTION

$$LOD=|A|+3s$$

Where:
A=the least squares intercept
("C" in the regression output table)

s=the standard deviation of replicate determinations
of the lowest standard

LIMIT OF QUANTITATION

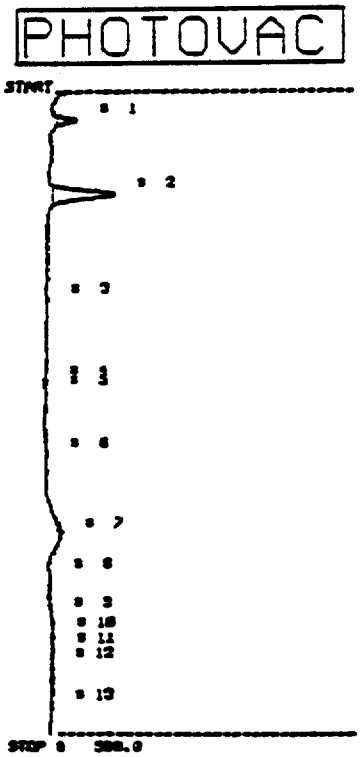
$$LOQ= 3.3*LOD$$

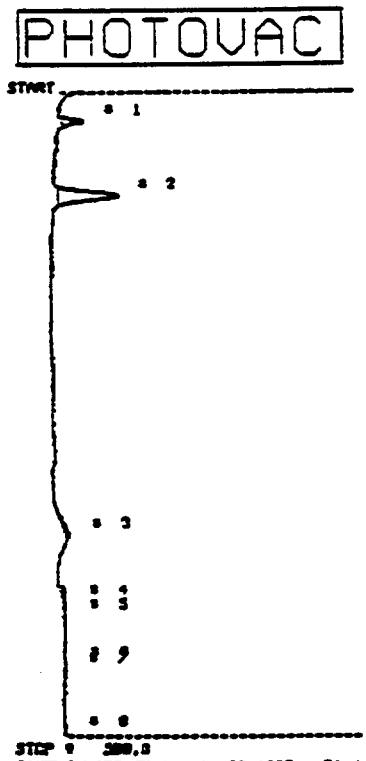
MILLIVOLTSECONDS

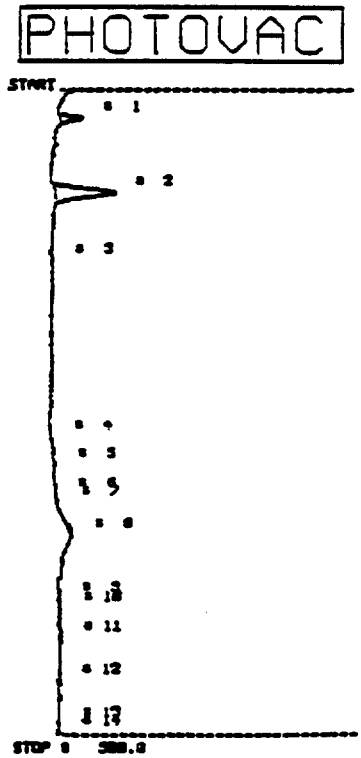
$$mVS= VS * 1000$$

3.22ppmv 1,3-Butadiene

Calibration Gas Standard

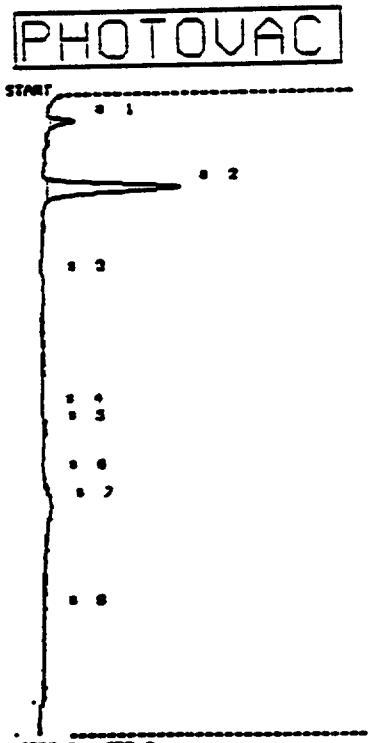


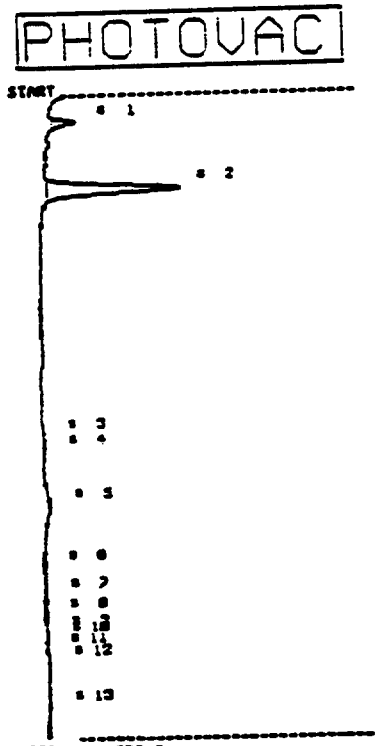


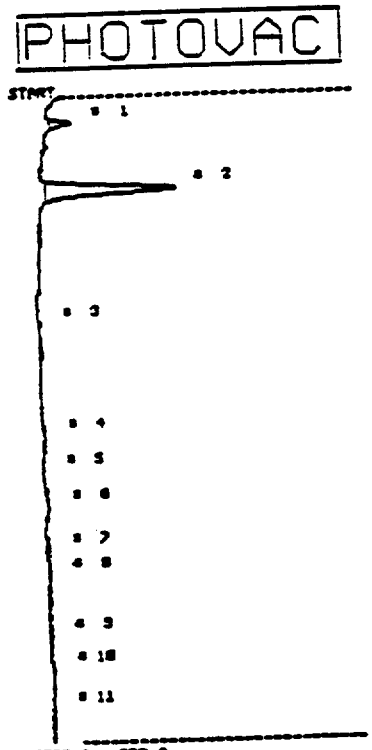


5.86ppmv 1,3-Butadiene

Calibration Gas Standard

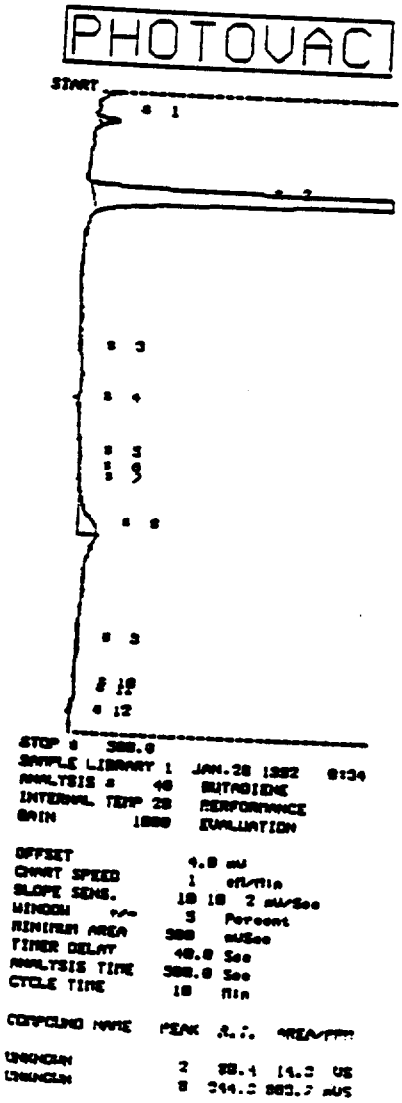


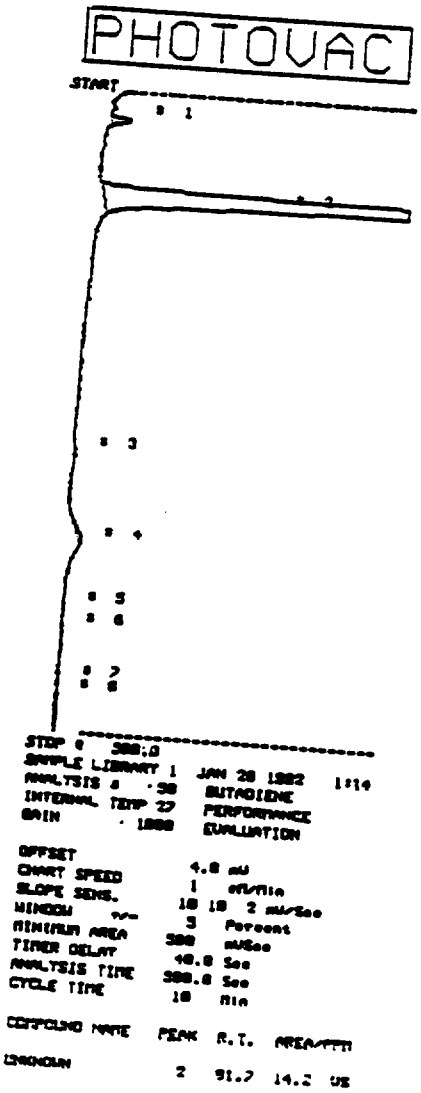


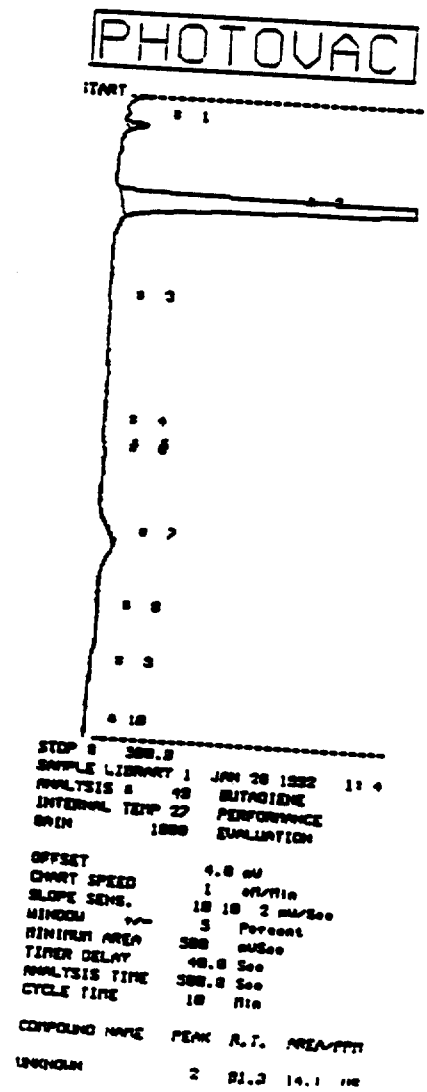


31.7ppmv 1,3-Butadiene

Calibration Gas Standard

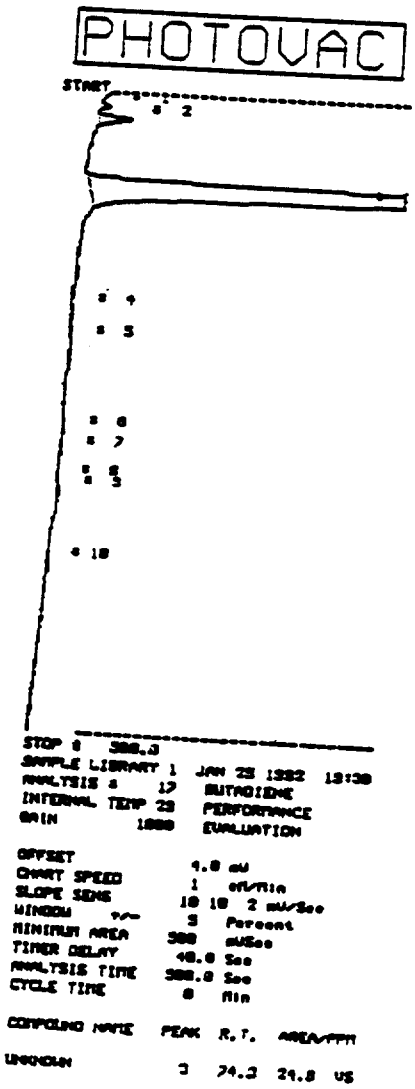


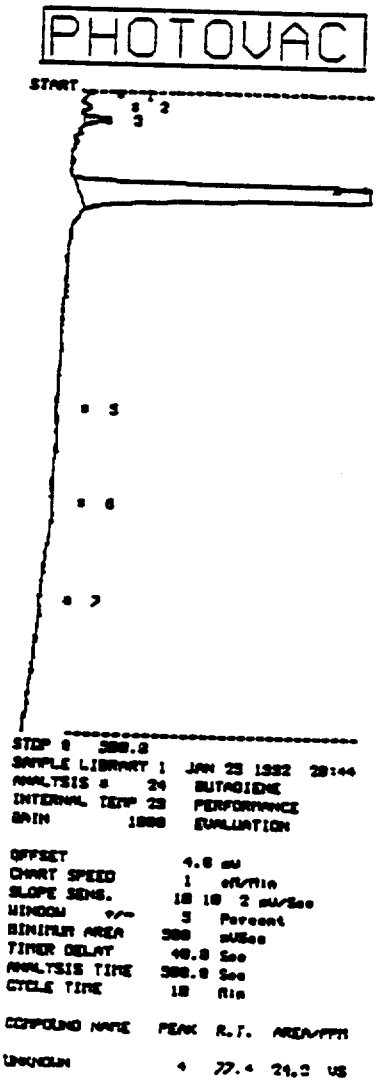


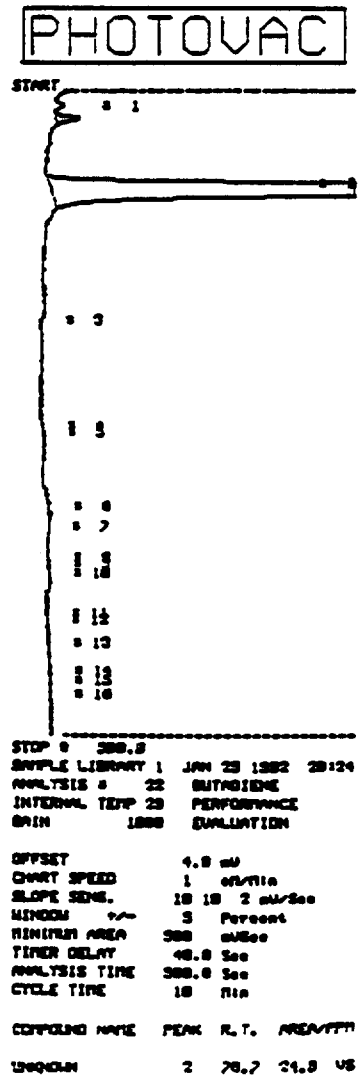


57.7ppmv 1,3-Butadiene

Calibration Gas Standard







Scott Specialty Gases, Inc.

Shipped From: 6141 EASTON ROAD PLUMSTEADVILLE PA 18949-0310
Phone: 215-766-8861 Fax: 215-766-0320

CERTIFICATE OF ANALYSIS

PETRO CHEM ENV SERVICES

3207 ANTONINO AVENUE

BAKERSFIELD CA 93308

PROJECT #: 01-34565
PO#: 1673
ITEM #: 01029230000 CL
DATE: 1/16/92

CYLINDER #: CAL10818

ANALYTICAL ACCURACY: +/-10%

COMPONENT	REQUESTED GAS CONC MOLES		ANALYSIS (MOLES)	
1,3-BUTADIENE	5.	PPB	5.86	PPB
NITROGEN		BAL		BAL

MICROGRAV - TM

ANALYST: Tom Sorensen APPROVED BY: M. SIRINIDES/T. NEEME

Scott Specialty Gases, Inc.

Shipped From: 6141 EASTON ROAD PLUMSTEADVILLE PA 18949-0310
Phone: 215-766-8861 Fax: 215-766-0320

CERTIFICATE OF ANALYSIS

PETRO CHEM ENV SERVICES

3207 ANTONINO AVENUE

BAKERSFIELD CA 93308

PROJECT #: 01-34565
PO#: 1673
ITEM #: 01029220060 CL
DATE: 1/16/92

CYLINDER #: CAL10937

ANALYTICAL ACCURACY: +/-10%

COMPONENT	REQUESTED GAS CONC MOLES		ANALYSIS (MOLES)	
1,3-BUTADIENE	50.	PPB	57.7	PPB
NITROGEN		BAL		BAL

MICROGRAV - TM

ANALYST: Tom Sassaman APPROVED BY: Mal S Sirinides
M.SIRINIDES/T.NEEME

APPENDIX III
AW FIELD DATA

ARB METHOD 410A
FIELD DATA

METHOD VOA 410A RUN # 1

COMPANY: BECHTEL
UNIT: K-36
DATE: 2-5-92
REPORT: 10-849A
TECH: JH
PUMP #: GAST
METER BOX#: 1001
METER coeff: .985190
PITOT TUBE#:

PRE / POST TEST LEAK CHECK
LEAK RATE: ~~.002~~ .002 cfm
VACUUM: 2 " Hg

AMBIENT TEMP, °F: 56°
Pbar: 28.80
STATIC PRESSURE("Hg): -.55
ASSUMED MOISTURE,%: 6
AVG. CALIB. NOZZLE DIAM(''): .193
PROBE LINER MATERIAL: QUARTZ
FILTER #:
DUCT DIAM (''): 35.5

TRAVERSE PT. NUMBER	TIME (θ) min.	VACUUM "Hg	STACK TEMP (Ts) °F	VELOCITY HEAD (ΔPs) "H2O	PRESSURE DIFFERENTIAL ΔH rate "H2O	ΔH	GAS SAMPLE VOLUME (cu. ft)	GAS SAMPLE TEMP. AT DRY GAS METER INLET, °F	OUTLET, °F	FILTER HOLDER TEMP °F Probe	Box	TEMP OF GAS EXIT CONDENSER OR LAST IMPINGER °F
CENTER POINT	10:10	<2			.04	0	258.13	81.4	78.4			
	10:20	<2			.04	0	258.49	84.2	82.4			
	10:30	<2			.04	0	258.88	81.6				
							.75					
AVERAGE												

Petro Chem Environmental Services, Inc.

METHOD UOA 410A RUN # 2

COMPANY: BECHTEL
UNIT: K-36
DATE: 2-5-92
REPORT: 10-849A
TECH: JH
PUMP #: METER-DUMP
METER BOX#:
METER coeff:
PITOT TUBE#:

PRE / POST TEST LEAK CHECK

LEAK RATE: .000 cfm
VACUUM: 2 "Hg

AMBIENT TEMP, °F: 60°
Pbar: 28.8
STATIC PRESSURE("Hg): -.55
ASSUMED MOISTURE,%: 6

AVG. CALIB. NOZZLE DIAM("): .193
PROBE LINER MATERIAL: QUARTZ
FILTER #:
DUCT DIAM ("): 35.5

TRAVERSE PT. NUMBER	TIME (θ) min.	VACUUM "Hg	STACK TEMP (Ts) °F	VELOCITY HEAD (ΔPs) "H2O	PRESSURE DIFFERENTIAL ΔH rate "H2O	ΔH	GAS SAMPLE VOLUME (cu. ft)	GAS SAMPLE TEMP. AT DRY GAS METER INLET, °F	OUTLET, °F	FILTER HOLDER TEMP °F Probe	Box	TEMP OF GAS EXIT CONDENSER OR LAST IMPINGER °F
CENTER POINT	10:53	<2	/	/	.04	0	259.43	82.8	77.8	/	/	/
	11:03	<2			.04	0	259.76	82.4	78			
	11:13	<2			.04	0	260.13	82.7	78.4			
							.70	(4.0)	(4)			
AVERAGE												

Petro Chem Environmental Services, Inc.

METHOD VOA 410A RUN # 3

COMPANY: BECHTEL
UNIT: K-36
DATE: 2-5-92
REPORT: 10-849A
TECH: H
PUMP #: Pump meter
METER BOX#: 1001
METER coeff: 995170
PITOT TUBE#:

PRE / POST TEST LEAK CHECK

LEAK RATE: .002 cfm
VACUUM: 2 " Hg

AMBIENT TEMP, °F: 78
Pbar: 28.8
STATIC PRESSURE("Hg): -.55
ASSUMED MOISTURE,%: 6

AVG. CALIB. NOZZLE DIAM(''): —
PROBE LINER MATERIAL: QUARTZ
FILTER #:
DUCT DIAM (''): 35.5

TRAVERSE PT. NUMBER	TIME (θ) min.	VACUUM "Hg	STACK TEMP (Ts) °F	VELOCITY HEAD (ΔPs) "H2O	PRESSURE DIFFERENTIAL ΔH rate "H2O	ΔH	GAS SAMPLE VOLUME (cu. ft)	GAS SAMPLE TEMP. AT DRY GAS METER INLET, °F	OUTLET, °F	FILTER HOLDER TEMP °F Probe	Box	TEMP OF GAS EXIT CONDENSER OR LAST IMPINGER °F
	1120	<2	/	/	.04	0	260.5	81.9	78.2	/	/	/
	1130	<2			.04	0	260.49	82.6	78.7			
	1140	<2			.04	0	261.23	80.4				
							.73					
AVERAGE												

ARB METHOD 429
FIELD DATA

COMPANY : BECHTEL
UNIT : K-36
DATE : 2-4-92
REPORT : 10-849A

ON-SITE DATA

		RUN	2-4 #1	2-4 #2	2-5 #3
		TIME	10:18 - 17:25	14:25 - 17:50	9:40 - 13:05
Vm	Dry sampled gas volume, dcf		117.84	~~100.63~~ 99.57	102.78
Y	Meter calibration factor (met# 1001 , 1001 , 1001)		.985170	.985170	.985170
Pbar	Barometric Pressure, "Hg		28.86	28.86	28.80
Pstatic	Stack static pressure, "Hg		-.55	-.55	-.55
ΔH	Differential meter pressure, "H2O		.74	.56	.589
Tm	Meter temperature, °F		102	93	91.4

CONTENTS	RUN 1 FINAL	RUN 1 TARE	RUN 1 NET	RUN 2 FINAL	RUN 2 TARE	RUN 2 NET	RUN 3 FINAL	RUN 3 TARE	RUN 3 NET
KO	597.5	453.0	144.5	569.3	447.7	121.60	575.7	453.7	122.0
H2O	626.1	626.0	.10	620.9	615.9	5.0	641.9	626.4	15.5
KO	489.2	487.5	1.7	515.1	513.1	2.0	490.7	488.5	2.20
Silica	849.9	828.7	21.2	818.2	801.6	16.6	889.9	872.5	17.4
V lc volume of H2O, gms			167.5			145.2			157.1

		RUN	#1	#2	#3
CO2	% Dry Volume		4.05	4.07	4.15
O2	% Dry Volume		13.8	13.75	13.6
N2	% Dry Volume				
Cp	Pitot tube coefficient (Pit# - , - , -)		.84	.84	.84
ΔP	Avg P, "H2O		1.178	1.220	1.35
Ts	Stack temperature, °F		577	578	604
As	Stack area, sq. ft.		6.87	6.87	6.87
Ds	Stack diameter, inches		35.5	35.5	35.5
Dn	Nozzle diameter, inches		.21	.193	.193
Dur	Sampling time, min		180	180	180
% Iso	Mini iso		100.21	99.57	

Filter #	-	-	-
Filter tare weights, gms	-	-	-

INITIALS
CONTROL BOX#:
Hi P_____ Lo P_____ Avg P_____ Duct Temp _____
Diameters before disturb_____ After_____
# of points, total _____
Overall (inches)_____ Coupling _____

Petro Chem Environmental Services, Inc.

METHOD 429 RUN # 1

COMPANY: BECHTEL
UNIT: K-36 LTS-1
DATE: 2-4-92
REPORT: 10-849 A
TECH: JT
PUMP #: GAST
METER BOX#: 1001 .950
METER coeff: .985170
PITOT TUBE#:

PRE/ POST TEST LEAK CHECK
LEAK RATE: .01 cfm
VACUUM: 10 "Hg

AMBIENT TEMP, °F: 58
Pbar: 28.86
STATIC PRESSURE("Hg): -.55
ASSUMED MOISTURE,%: 6
AVG. CALIB. NOZZLE DIAM("): .23 .21
PROBE LINER MATERIAL: QUARTZ
FILTER #:
DUCT DIAM ("): 35.5

TRAVERSE PT. NUMBER	TIME (θ) min.	VACUUM "Hg	STACK TEMP (Ts) °F	VELOCITY HEAD (ΔPs) "H2O	PRESSURE DIFFERENTIAL ΔH "H2O		GAS SAMPLE VOLUME (cu. ft)	GAS SAMPLE TEMP. AT DRY GAS METER INLET, °F	OUTLET, °F	FILTER HOLDER TEMP °F Probe	Box	TEMP OF GAS EXIT CONDENSER OR LAST IMPINGER °F	RESIN TRAP
					rate	ΔH							
12 0	10:18	7	571	1.8	.931	1.45	942.85	70	85	253	253	58	58
11 7.5		7	573	1.7	.754	.98	948.71	74	82	286	259	55	58
10 15	10:33	6.5	579	1.6	.734	.93	954.37	76	86	295	261	57	56
9 22.5		6.0	582	1.5	.714	.88	959.88	80	89	300	258	59	56
8 30	10:48	5.5	582	1.2	.642	.72	965.24	84	91	298	257	59	57
7 37.5		5.5	580	1.2	.644	.73	970.11	85	93	282	258	60	58
6 45	11:03	5	580	.90	.562	.57	974.94	88	97	273	256	59	58
5 52.5		5	578	.91	.569	.58	979.16	93	100	258	257	59	59
4 60	11:19	5.25	576	1.0	.599	.63	983.45	92	103	258	258	60	59
3 67.5		5.25	574	.99	.598	.62	987.94	94	106	252	254	61	59
2 75	11:33	5	574	.82	.547	.53	992.43	95	110	259	258	61	58
1 82.5		5	572	.81	.548	.53	996.53	98	115	257	253	61	59
PC 90	11:48						1000.64						
										150=100.18			
AVERAGE													

METHOD 429 RUN # 1 cont'd.

COMPANY: BECHTEL
UNIT: K-36 LTS-1
DATE: 2-4-92
REPORT: 10-849A
TECH: JH
PUMP #: GAST
METER BOX#: 1001
METER coeff: .985170 .950
PITOT TUBE#:

PRE / POST TEST LEAK CHECK

LEAK RATE: .015 cfm
VACUUM: 10 "Hg

AMBIENT TEMP, °F: 84°
Pbar: 28.56
STATIC PRESSURE("Hg): -.55
ASSUMED MOISTURE,%: 6
AVG. CALIB. NOZZLE DIAM("): .21
PROBE LINER MATERIAL: QUARTZ
FILTER #:
DUCT DIAM ("): 35.5

TRAVERSE PT. NUMBER		TIME (θ) min.	VACUUM "Hg	STACK TEMP (Ts) °F	VELOCITY HEAD (ΔPs) "H2O	PRESSURE DIFFERENTIAL ΔH rate "H2O	ΔH	GAS SAMPLE VOLUME (cu. ft)	GAS SAMPLE TEMP. AT DRY GAS METER INLET, °F	OUTLET, °F	FILTER HOLDER TEMP °F Probe	Box	TEMP OF GAS EXIT CONDENSER OR LAST IMPINGER °F	REG. TRAP
								942.85						
12	0	11:55	5.5	573	1.21	.674	.76	1000.64	102	118	258	255	61	58
11	7.5		6.0	574	1.29	.696	.80	5.70	102	119	275	259	61	57
10	15	12:10	5.5	573	1.15	.658	.72	10.92	102	120	300	257	60	55
9	22.5		5.5	574	1.09	.642	.69	15.86	104	120	310	259	61	55
8	30	12:25	5.25	576	.99	.612	.64	20.68	105	120	308	251	62	55
7	37.5		5.25	577	.95	.600	.61	25.27	107	120	295	247	62	56
6	45	12:40	5	579	.80	.553	.53	29.77	109	124	294	248	63	56
5	52.5		6	582	1.40	.729	.86	33.92	107	124	283	261	63	57
4	60	12:55	7	584	1.51	.758	.92	39.39	109	125	267	244	64	57
3	67.5		7	584	1.52	.760	.93	45.08	108	125	269	260	63	57
2	75	1:10	6	581	1.34	.709	.83	50.78	106	118	268	262	62	58
1	82.5		5.25	574	1.0	.612	.64	56.10	103	116	259	263	63	58
EOT	90	1:25						60.69						
											ISO=	100.21		
								117.94'			VEL FPS=	89.16		
AVERAGE				577	1.178		.74		102					

METHOD 429 RUN # 2

COMPANY: BECHTEL
UNIT: K-36
DATE: 2-4-92
REPORT: 10-849A
TECH: JT
PUMP #: GAST
METER BOX#: 1001
METER coeff: .985170 .950
PITOT TUBE#:

PRE / POST TEST LEAK CHECK

LEAK RATE: .008 cfm
VACUUM: 15 "Hg

AMBIENT TEMP, °F: 85°
Pbar: 28.86
STATIC PRESSURE("Hg): -.55
ASSUMED MOISTURE,%: 6

AVG. CALIB. NOZZLE DIAM("): .193
PROBE LINER MATERIAL: QUARTZ
FILTER #:
DUCT DIAM ("): 35.5

TRAVERSE PT. NUMBER		TIME (θ) min.	VACUUM "Hg	STACK TEMP (Ts) °F	VELOCITY HEAD (ΔPs) "H2O	PRESSURE DIFFERENTIAL ΔH rate "H2O	ΔH	GAS SAMPLE VOLUME (cu. ft)	GAS SAMPLE TEMP. AT DRY GAS METER INLET, °F	OUTLET, °F	FILTER HOLDER TEMP °F Probe	Box	TEMP OF GAS EXIT CONDENSER OR LAST IMPINGER °F	
12	0	2:25	5	583	1.11	.527	.51	61.05	92	94	255	245	58	56
11	7.5		5.5	586	1.28	.566	.57	65.0	90	98	258	240	59	56
10	15	2:40	5	594	1.15	.532	.52	69.3	90	93	260	244	59	56
9	22.5		4.5	595	1.00	.499	.46	73.2	92	98	259	241	59	57
8	30	2:55	4.5	601	1.05	.513	.48	76.9	95	102	259	242	60	57
7	37.5		4.5	604	.92	.480	.43	80.8	95	104	260	244	60	57
6	45	3:10	6	610	1.40	.595	.61	84.4	98	109	260	243	60	58
5	52.5		7	609	1.55	.629	.67	88.9	100	111	259	245	60	58
4	60	3:25	8	599	1.71	.665	.74	93.6	101	113	260	243	61	58
3	67.5		7	593	1.45	.615	.65	98.5	102	114	259	248	61	58
2	75	3:40	6	590	1.40	.605	.63	103.1	103	113	262	243	61	59
1	82.5		6	547	1.31	.599	.62	107.6	103	115	261	242	61	59
PC	90	3:55						112.1						
AVERAGE														

Petro Chem Environmental Services, Inc.

METHOD 429 RUN #2 cont

COMPANY: DECHTEL
UNIT: K-36
DATE: 2-4-92
REPORT: 10-849A
TECH: JH
PUMP #: GAST
METER BOX#: 1001
METER coeff: .985170 .950
PITOT TUBE#:

PRE / POST TEST LEAK CHECK

LEAK RATE: .017 cfm
VACUUM: 10 " Hg

AMBIENT TEMP, °F: 85
Pbar: 28.86
STATIC PRESSURE("Hg): -.55
ASSUMED MOISTURE,%: 6

AVG. CALIB. NOZZLE DIAM("): .193
PROBE LINER MATERIAL: QUARTZ
FILTER #:
DUCT DIAM ("): 35.5

TRAVERSE PT. NUMBER		TIME (θ) min.	VACUUM "Hg	STACK TEMP (Ts) °F	VELOCITY HEAD (ΔPs) "H2O	PRESSURE DIFFERENTIAL ΔH rate "H2O	ΔH	GAS SAMPLE VOLUME (cu. ft) 64.05	GAS SAMPLE TEMP. AT DRY GAS METER INLET, °F	OUTLET, °F	FILTER HOLDER TEMP °F Probe	Box	TEMP OF GAS EXIT CONDENSER OR LAST IMPINGER °F	
12	0	4:20	8	572	1.70	.658	.74	112.1	96	95	255	243	57	56
11	7.5		8	573	1.70	.655	.74	117.0	91	95	258	242	57	56
10	15	4:35	7	570	1.60	.635	.70	121.9	91	93	259	244	58	56
9	22.5		6	570	1.40	.590	.62	126.7	88	89	257	238	58	56
8	30	4:50	6	570	1.37	.592	.61	131.1	87	86	257	241	58	57
7	37.5		5	575	1.17	.535	.53	135.5	86	85	258	250	58	57
6	45	5:05	4.5	574	.95	.480	.44	139.5	83	83 81	259	285	59	58
5	52.5		4	572	.89	.463	.41	143.1	81	79	256	228	59	58
4	60	5:20	4	574	.88	.459	.41	146.6	80	77	256	263	58	58
3	67.5		4.5	569	.95	.478	.44	150.0	80	77	256	235	58	59
2	75	5:35	4	563	.92	.470	.43	153.6	78	75	256	260	58	59
1	82.5		3.5	489	.91	.456	.41	157.2	77	73	226	216	58	59
GOT	90	5:50						160.62						
											ISO=	100.19		
								99.57			VEL FPS=	90.79		
AVERAGE				578	1.220		.56		83					

Petro Chem Environmental Services, Inc.

28432

METHOD 429 RUN #3

COMPANY: Bechtel
UNIT: K-36
DATE: 2-5-92
REPORT: 10-849A
TECH: JH
PUMP #: GAST
METER BOX#: 1001
METER coeff: .985170
PITOT TUBE#:

PRE / POST TEST LEAK CHECK

LEAK RATE: .007 cfm
VACUUM: 15 "Hg

AMBIENT TEMP, °F: 56°
Pbar: 28.80
STATIC PRESSURE("Hg): -.55
ASSUMED MOISTURE,%: 6

AVG. CALIB. NOZZLE DIAM(''): .193
PROBE LINER MATERIAL: Quartz
FILTER #:
DUCT DIAM (''): 355

TRAVERSE PT. NUMBER		TIME (θ) min.	VACUUM "Hg	STACK TEMP (Ts) °F	VELOCITY HEAD (ΔPs) "H2O	PRESSURE DIFFERENTIAL ΔH rate "H2O	ΔH	GAS SAMPLE VOLUME (cu. ft)	GAS SAMPLE TEMP. AT DRY GAS METER INLET, °F	OUTLET, °F	FILTER HOLDER TEMP °F Probe	Box	TEMP OF GAS EXIT CONDENSER OR LAST IMPINGER °F	LESS WATER
12	0	9:40	3.5	595	1.33	.547	.57	161.62	63	71	247	240	54	53
11	7.5		5	597	1.41	.568	.60	165.7	68	77	258	236	55	53
10	15	9:55	4	604	1.24	.538	.54	170.0	76	83	255	237	56	53
9	22.5		4	606	1.21	.532	.53	174.1	76	84	257	240	56	54
8	30	10:10	3.5	605	1.12	.517	.50	178.1	83	89	258	225	56	54
7	37.5		3.5	608	1.11	.515	.49	181.2	84	90	258	236	57	54
6	45	10:25	5.5	609	1.49	.601	.64	185.1	88	94	258	242	57	55
5	52.5		5.5	614	1.54	.612	.66	189.6	90	96	259	234	57	55
4	60	10:40	6	616	1.70	.643	.72	194.2	94	93	259	242	57	56
3	67.5		6	615	1.65	.634	.70	199.0	93	94	260	244	58	56
2	75	10:55	5.75	606	1.60	.628	.69	203.8	96	94	260	243	58	57
1	82.5		5.5	595	1.50	.613	.65	208.5	97	96	261	237	58	57
PX	90	11:10						213.1						
							1.589		91.4					
AVERAGE														

METHOD 429 RUN # 3 cont'd

COMPANY: BECHTEL
UNIT: K-36
DATE: 2-5-92
REPORT: 10-849A
TECH: JH
PUMP #: 6955
METER BOX#: 1001
METER coeff: .985170
PITOT TUBE#:

PRE / POST TEST LEAK CHECK

LEAK RATE: .008 cfm
VACUUM: 9.5 "Hg

AMBIENT TEMP, °F: 60
Pbar: 28.50
STATIC PRESSURE("Hg): -.55
ASSUMED MOISTURE,%: 6

AVG. CALIB. NOZZLE DIAM("): .193
PROBE LINER MATERIAL: QUARTZ
FILTER #:
DUCT DIAM ("): 35.5

TRAVERSE PT. NUMBER		TIME (θ) min.	VACUUM "Hg	STACK TEMP (Ts) °F	VELOCITY HEAD (ΔPs) "H2O	PRESSURE DIFFERENTIAL ΔH rate "H2O	ΔH	GAS SAMPLE VOLUME (cu. ft)	GAS SAMPLE TEMP. AT DRY GAS METER INLET, °F	OUTLET, °F	FILTER HOLDER TEMP °F Probe	Box	TEMP OF GAS EXIT CONDENSER OR LAST IMPINGER °F	
12	0	11:35	7.25	609	1.99	.711	.84	213.1	103	105	259	238	56	55
11	7.5		7	611	1.89	.689	.80	218.4	102	101	255	225	56	55
10	15	11:50	7	612	1.81	.671	.76	223.6	99	98	257	241	57	55
9	22.5		6	615	1.62	.629	.69	228.6	96	94	259	237	57	56
8	30	12:05	6	618	1.54	.616	.66	233.3	99	96	258	232	58	56
7	37.5		5	616	1.31	.564	.57	237.9	96	90	264	243	59	56
6	45	12:20	4	617	1.20	.540	.53	242.2	96	99 91	265	244	58	57
5	52.5		3.5	612	1.09	.516	.49	246.3	97	91	264	240	59	57
4	60	12:35	3.5	615	1.12	.523	.50	250.2	97	93	262	242	59	58
3	67.5		3	614	1.01	.499	.46	254.1	98	98 96	262	240	60	58
2	75	12:50	2.5	580	.82	.462	.40	257.8	99	97	263	241	60	59
1	82.5		2	528	.62	.408	.32	261.3	99	97	265	239	60	59
END	90	1:05						264.4						
								102.78		150=				
AVERAGE				604	1.350		.589			91.4				

K-36 | Rinse Volumes 2-3-92 {Sample Blank

System A BLANK Resin Trap ST617 #12

Sample	MEOH	HEXANE	MECL2	H2O
P/N : F.T.	12+ 36.0 / 48	12+ 32.5 / 44.5	12+ 59.4 / 71.4	–
SL/Condenser : F.B.	17.7 + 43.4 / 61.1	16.9 + 16.8 / 33.7	18.2 + 70.0 / 88.2	–
1st impinger	35.8	38.0	70.4	–
2nd impinger	–	–	–	52.5

2-4-92 RUN #1 Resin Trap # ST617 #8

SAMPLE	MEOH	HEXANE	MECL2	H2O
P/N : FT	5.5 + 4.4 + 5.6 / 15.2 + 28.8 = 44.0	4.4 + 3.4 + 5.3 / 13.1 + 33.7 = 46.8	4.5 + 7.8 + 9.9 / 22.2 + 57.2 = 79.4	–
SL/Condenser/FB	+ 4.3 / 6.6 + 10.2 + 6.6 / + 24.3 = 52	+ 3.4 / 3.6 + 3.7 + 6.1 / + 47.2 = 64.0	+ 5.4 / 7.4 + 8.7 + 10.3 / + 55.4 = 87.2	–
1ST imp.	37.6	24.5	31.1	–
2nd imp.	–	–	–	39.8

RUN #2 RESIN TRAP # ST617 # 14

	MEOH	HEX	MECL2	H2O
P/N : FT	9.2 + 10.2 + 8.7 / + 33.1	6.7 + 7.0 + 7.8 / + 42.9	7.7 + 9.0 + 8.4 / 75.5	–
SL/Condenser/FB	5.8 + 16.4 + 28.9	9.1 + 12.1 + 30.1	10.9 + 23.4 + 73.6	–
1ST imp	26.3	33.5	48.5	
2nd imp	–	–	–	45.6

Rinse Volumes	K-36 LTS-1

2-5-92 RUN #3 RESIN TRAP # 5T617 # 9

SAMPLE	MEOH	HEXANE	MECL2	H2O
P&N & FT	4.5+5.8+6.1 36.1	4.0+4.0+5.0 41.2	5.3+9.8+6.5 31.3	-
Sm. L/Condenser FB	6.3+22.6+25.2	7.8+16.3+27.5	8.4+32.0+40.5	-
1ST Impinger	43.0	26.4	44.4	-
2nd Impinger	-	-	-	60.5

ARB METHOD 430
FIELD DATA

METHOD Formaldehyde RUN # 1

COMPANY: Bechtel
UNIT: K-36
DATE: 2-5-92
REPORT: 10-849A
TECH: JH
PUMP #: Meth 18 Sampler
METER BOX#: 1601 } meter temp only
METER coeff:
PITOT TUBE#:

PRE / POST TEST LEAK CHECK

LEAK RATE: .000 02 cfm
VACUUM: "Hg

AMBIENT TEMP, °F: 78°
Pbar: 28.8
STATIC PRESSURE("Hg): -.55
ASSUMED MOISTURE,%: 6

AVG. CALIB. NOZZLE DIAM("): —
PROBE LINER MATERIAL: Quartz
FILTER #:
DUCT DIAM ("): 35.5

TRAVERSE PT. NUMBER	TIME (e) min.	VACUUM "Hg	STACK TEMP (Ts) °F	VELOCITY HEAD (ΔPs) "H2O	PRESSURE DIFFERENTIAL ΔH rate	PRESSURE DIFFERENTIAL ΔH "H2O ΔH	GAS SAMPLE VOLUME (cu. ft)	GAS SAMPLE TEMP. AT DRY GAS METER INLET, °F	GAS SAMPLE TEMP. AT DRY GAS METER OUTLET, °F	FILTER HOLDER TEMP °F Probe	FILTER HOLDER TEMP °F Box	TEMP OF GAS EXIT CONDENSER OR LAST IMPINGER °F
center point 0	1:40	2			5 lpm		volume calculated by flow rotometer		83	264		
20	2:00	2			5				84	261		
40	2:20	2			5		5 x 100 % / 28.57		84	262		
60	2:40	2			5		1.75 CF		84	264		
80	3:00	2			5				83	257 ~~257~~		
minutes 100	3:20	2			5				83	262		
									84			
AVERAGE												

METHOD Formaldehyde RUN # 2

COMPANY: BECHTEL
UNIT: K-36
DATE: 2-5-92
REPORT: 10-8419A
TECH: JH
PUMP #: METHI8 Sampler
METER BOX#: 1001 } pre/post
METER coeff:
PITOT TUBE#:

PRE / POST TEST LEAK CHECK

LEAK RATE: .000 @ 2 cfm
VACUUM: " Hg

AMBIENT TEMP, °F: 52
Pbar: 28.8
STATIC PRESSURE("Hg): -.55
ASSUMED MOISTURE,%: 6
AVG. CALIB. NOZZLE DIAM(''): —
PROBE LINER MATERIAL: Quartz
FILTER #:
DUCT DIAM (''): 35.5

TRAVERSE PT. NUMBER	TIME (e) min.	VACUUM "Hg	STACK TEMP (Ts) °F	VELOCITY HEAD (ΔPs) "H2O	PRESSURE DIFFERENTIAL ΔH rate "H2O	ΔH	GAS SAMPLE VOLUME (cu. ft)	GAS SAMPLE TEMP. AT DRY GAS METER INLET, °F	OUTLET, °F	FILTER HOLDER TEMP °F Probe	Box	TEMP OF GAS EXIT CONDENSER OR LAST IMPINGER °F
0	3:21	2			5 lpm	/			84	266		
20	3:41	2			5				84	247		
40	4:01	2			5				84	260		
60	4:21	2			5				84	260		
80	4:41	2			5		5 lpm × 100 min = 1/2 = .5		84	258		
100	5:01	2			5				84	259		
							1.75 CF		84			
AVERAGE												

METHOD FORMALDEHYDE RUN # 3

COMPANY: BECHTEL
UNIT: K-36
DATE: 2-5-92
REPORT: 10-8119A
TECH: H
PUMP #: METH 1.8 Sampler
METER BOX#: 1001 } probe temp
METER coeff:
PITOT TUBE#:

PRE / POST TEST LEAK CHECK

LEAK RATE: .000 @ 2 cfm
VACUUM: " Hg

AMBIENT TEMP, °F: 50
Pbar: 28.8
STATIC PRESSURE("Hg): -.55
ASSUMED MOISTURE,%: 6
AVG. CALIB. NOZZLE DIAM(''): —
PROBE LINER MATERIAL: QUARTZ
FILTER #:
DUCT DIAM (''): 35.5

TRAVERSE PT. NUMBER	TIME (θ) min.	VACUUM "Hg	STACK TEMP (Ts) °F	VELOCITY HEAD (ΔPs) "H2O	PRESSURE DIFFERENTIAL ΔH rate	"H2O ΔH	GAS SAMPLE VOLUME (cu. ft)	GAS SAMPLE TEMP. AT DRY GAS METER INLET, °F	OUTLET, °F	FILTER HOLDER TEMP °F Probe	Box	TEMP OF GAS EXIT CONDENSER OR LAST IMPINGER °F
0	5:02	2			5 lpm				83	261		
					5							
20	5:22	2			5				80	260		
40	5:42	2			5				80	260		
60	6:02	2			5				80	259		
80	6:22	2			5				79	257		
100	6:42	2			5		5 x 100 % / 28.57		79	258		
							1.75		80			
AVERAGE												

Petro Chem Environmental Services, Inc.

INTERNAL COMBUSTION ENGINE
SOURCE TEST DATA

DEPT 640

AEP 353
DATE 2-4-92

COMP NO.	K36	-	-	-	-	-		
LOCATION	LTS-1	-	-	-	-	-		
START TIME	10:00	11:10	12:25	1:35	2:50	4:10		
END TIME	11:00	12:10	1:25	2:35	3:50	5:10		
FUEL GAS METER DATA								
COEFFICIENT	.017	-	-	-	-	-		
STATIC	7.45	7.45	7.45	7.5	7.45	7.45		
DIFF.	6.15	6.15	6.2	6.15	6.0	6.0		
MCF/D	779	779	785	784	760	760		
COMPRESSOR OPERATION PARAMETERS								
SUC PRESS.	375	375	360	364	360	360		
DISCH PRESS.	2690	2690	2690	2660	2650	2650		
RATED HP.	5500	-	-	-	-	-		
TESTED HP.	4180	4180	4001	4001	4146	4146		
% LOAD	77	77	74	74	76	76		
RPM	347	347	347	348	348	348		
SPARK	14.5	14.5	14.5	14.5	14.5	14.5		
AIR-MANIFOLD PRESS.	27.6	27.6	27.6	28.4	27.6	27.6		
GAS PRESS.	27.5	27.5	27.5	28.3	27.5	27.5		
PRELIMINARY SOURCE TEST DATA (IN GR/BHP-HR AND LBS-HR)								
EF GAS	9.6	-	-	-	-	-		
O2 %	13.75	13.98	13.75	13.75	13.5	14.0		
DSCFM	15178	15683	15302	15280	14308	15345		
PPM NOx	86	95	85	77	95	63		
LBS-HR NOx	9.49	10.84	9.46	8.56	9.89	7.03		
GR/BHP-HR	1.03	1.18	1.07	.97	1.08	.77		
PPM CO	545	545	550	570	525	620		
LBS-HR CO	36.62	37.84	37.26	38.56	33.25	42.12		
GR/BHP-HR	3.98	4.11	4.23	4.38	3.64	4.61		

I.C. ENGINE SOURCE TEST REPORT

COMPANY - Naval Petroleum Reserve No. 1 DATE - 2-4-92

APCD/EPA NUMBERS - 4091023 B

REASON FOR TEST - Air Toxics TEST COMPANY - BPOI

EQUIPMENT DESCRIPTION - 5500 HP Ingersoll-Rand

NOx CONTROL - CAT. CONV. ___ PSC ___ PCC ✓ O2 ___

POLLUTANTS TESTED - PM ___ SO4 ___ SO2 ___ NOX ✓ CO ✓ H2S ___ HC ✓

APPLICABLE RULES - 210.1 ___ 427 ___ VEE PERFORMED - YES ✓ NO ___

ENGINE LOCATION - Sec 35/T30S/R23E

		1	2	3	4	5	6
TIME		10:00	11:30	12:45	2:00	3:00	4:15
RPM		347	347	347	347	348	348
HORSEPOWER		4180	4180	4001	4001	4146	4146
CATALYST TEMP.							
FUEL	READING	7.45 / 6.15	7.45 / 6.15	7.45 / 6.2	7.5 / 6.15	7.45 / 6.0	7.45 / 6.0
	RATE	779	779	785	784	760	760
SUCTION	PRESS. 1	375	375	360	364	360	360
	PRESS. 2						
DISCHARGE	PRESS. 1	2690	2690	2690	2660	2650	2650
	PRESS. 2						

FUEL TYPE natural gas Avg. FUEL RATE - 774.50 % OF LOAD 1&2-77 3&4-74 5&6-76 FUEL COEF. .017

POLLUTANT	SPAN GAS	RANGE	INSTR. ANALYSIS	INSTR. MFG.
NOx	233	0-250		Teco 10
CO	208.5	0-1000		Teco 48
O2	20.9	0-25		Teledyne
Date of expiration	NOx 4-1-92	CO 4-1-92	O2 N/A	
SPAN / ZERO DRIFT < 5% OF RANGE - YES ( ) NO ( )				

	1	2	3	4	5	6		
TIME	10:00 / 11:00	11:10 / 12:10	12:25 / 1:25	1:35 / 2:35	2:50 / 3:50	4:10 / 5:10		
NOx	86	95	85	77	95	63		
CO	545	545	550	570	525	620		
O2	13.75	13.98	13.75	13.75	13.50	14.00		

COMMENTS - HP taken every other run (1,3,5 etc).
Fuel meter calibration 12-17-91 WBL

OBSERVER - M. Carr

Petro Chem Environmental Services, Inc.

COMPRESSOR PERFORMANCE REPORT

BECHTEL PETROLEUM OPERATIONS, INC.

Location : ELK HILLS, CA

Unit Mfr : INGERSOLL-RAND Model: KVR 616

Unit name: K36 Date: 4-Feb-92 10:06:59

CYL	SERVICE (stage)	CLR SET (%)	PRESSURES Ps (psi)	PRESSURES Pd (psi)	TEMPS SU (dg F)	TEMPS DIS (dg F)	CALC CAPACITY (MMSCFD)	IHP (hp)	DIS T DELTA (dg F)	ROD LOAD (%)
1H	2ndStageIn	10	1315.3	2889.3	61	231	18.35	783.9	181	84C
1C	2ndStageIn	10	1311.8	2896.4*	61	231	10.80	425.2	180	25T
2H	1stStageIn	10	362.8	1410.8	53	227	5.54	331.3	17	102C
2C	1stStageIn	10	364.0	1404.0	53	227	8.10	515.5	18	80T
3H	1stStageIn	10	364.1	1402.8	53	232	9.96	659.2	26	105C
3C	1stStageIn	10	364.0	1413.3	53	232	7.80	502.7	24	81T
4H	2ndStagePr	10	40.8	193.8*	-27	178	.87	88.3	115	85C
4C	2ndStagePr	10	39.8	187.4*	-27	178	4.54	305.4	117	83T
5H	1stStagePr	10	5.0	60.5*	-15	83	.98	87.8	-6	34C
5C	1stStagePr	10	5.1	55.8*	-15	83	.79	41.8	2	27T
6H	1stStagePr	10	3.5	54.2*	-15	83	2.08	173.2	-3	32C
6C	1stStagePr	10	3.8	49.1*	-15	83	.61	57.0	7	27T

Total indicated horsepower (IHP) = 3971 @ 347 RPM
Gas horsepower (GHP) = 4180 @ 347 RPM
Compressor total horsepower (BHP) = 4180 @ 347 RPM
Rated horsepower (BHP) = 5500 @ 350 RPM
Derated horsepower (BHP) = 5455 for 347 RPM
Percent Load = 77%

* WARNING: Check the measured line pressures

Recommendations and Observations:
CONTINUOUS EMISSIONS MONITORING DURING AIR TOXIC EVALUATION.RUN 1 & 2.
HP'S TAKEN EVERY OTHER RUN.

Analyst signature: _____

Petro Chem Environmental Services, Inc.

COMPRESSOR PERFORMANCE REPORT

BECHTEL PETROLEUM OPERATIONS, INC.

Location : ELK HILLS, CA

Unit Mfr : INGERSOLL-RAND Model: KVR 616

Unit name: K36 Date: 4-Feb-92 12:41:21

CYL	SERVICE (stage)	CLR SET (%)	PRESSURES Ps (psi)	PRESSURES Pd (psi)	TEMPS SU (dg F)	TEMPS DIS (dg F)	CALC CAPACITY (MMSCFD)	IHP (hp)	DIS T DELTA (dg F)	ROD LOAD (%)
1H	2ndStageIn	10	1250.5	2796.5	61	231	17.01	743.2	172	83C
1C	2ndStageIn	10	1243.3	2809.3	61	231	9.99	399.6	171	25T
2H	1stStageIn	10	343.3	1326.0	53	227	5.22	309.8	17	97C
2C	1stStageIn	10	340.8	1329.4	53	227	7.64	484.7	15	76T
3H	1stStageIn	10	345.3	1333.3	53	232	9.26	611.5	24	100C
3C	1stStageIn	10	342.0	1338.0	53	232	7.28	478.3	22	77T
4H	2ndStagePr	10	42.8	199.4*	-27	178	.95	99.0	116	87C
4C	2ndStagePr	10	40.1	193.6*	-27	178	2.99	316.3	113	86T
5H	1stStagePr	10	4.1	58.0*	-15	83	.98	84.7	-6	33C
5C	1stStagePr	10	4.9	59.6	-15	83	0.0	43.4	Unloaded	30T
6H	1stStagePr	10	4.0	56.7*	-15	83	2.30	175.9	-5	32C
6C	1stStagePr	10	4.6	53.0*	-15	83	.64	54.5	4	29T

Total indicated horsepower (IHP) = 3801 @ 346 RPM
Gas horsepower (GHP) = 4001 @ 346 RPM
Compressor total horsepower (BHP) = 4001 @ 346 RPM
Rated horsepower (BHP) = 5500 @ 350 RPM
Derated horsepower (BHP) = 5443 for 346 RPM
Percent Load = 74%

* WARNING: Check the measured line pressures

Recommendations and Observations:
CONTINUOUS EMISSIONS MONITORING DURING AIR TOXIC EVALUATION.RUN 3 & 4.
HP'S TAKEN EVERY OTHER RUN.

Analyst signature: _____

Petro Chem Environmental Services, Inc.

COMPRESSOR PERFORMANCE REPORT

BECHTEL PETROLEUM OPERATIONS, INC.

Location : ELK HILLS, CA

Unit Mfr : INGERSOLL-RAND Model: KVR 616

Unit name: K36 Date: 4-Feb-92 15:22:47

CYL	SERVICE (stage)	CLR SET (%)	PRESSURES Ps (psi)	PRESSURES Pd (psi)	TEMPS SU (dg F)	TEMPS DIS (dg F)	CALC CAPACITY (MMSCFD)	IHP (hp)	DIS T DELTA (dg F)	ROD LOAD (%)
1H	2ndStageIn	10	1282.0	2740.0	61	231	17.73	734.2	179	79C
1C	2ndStageIn	10	1281.3	2746.6	61	231	10.56	397.8	179	22T
2H	1stStageIn	10	358.4	1375.8	53	227	5.44	324.8	19	99C
2C	1stStageIn	10	359.0	1368.3	53	227	8.09	507.6	20	78T
3H	1stStageIn	10	361.5	1371.5	53	232	9.78	633.6	28	103C
3C	1stStageIn	10	363.8	1379.8	53	232	7.73	492.3	28	79T
4H	2ndStagePr	10	45.9	201.1*	-27	178	1.29	137.8	121	86C
4C	2ndStagePr	10	44.5	195.8*	-27	178	3.49	348.7	122	85T
5H	1stStagePr	10	5.3	57.6*	-15	83	1.38	86.8	0	33C
5C	1stStagePr	10	4.3	56.6	-15	83	0.0	45.8	Unloaded	28T
6H	1stStagePr	10	3.6	55.1*	-15	83	2.15	176.8	-4	33C
6C	1stStagePr	10	4.6	53.5*	-15	83	.38	52.9	3	29T

Total indicated horsepower (IHP) = 3939 @ 347 RPM
Gas horsepower (GHP) = 4146 @ 347 RPM
Compressor total horsepower (BHP) = 4146 @ 347 RPM
Rated horsepower (BHP) = 5500 @ 350 RPM
Derated horsepower (BHP) = 5457 for 347 RPM
Percent Load = 76%

* WARNING: Check the measured line pressures

Recommendations and Observations:
CONTINUOUS EMISSIONS MONITORING DURING AIR TOXIC EVALUATION.RUN 5 & 6.
HP'S TAKEN EVERY OTHER RUN.

Analyst signature: MBS

Petro Chem Environmental Services, Inc.

INTERNAL COMBUSTION ENGINE
SOURCE TEST DATA

DEPT 640

AEP 353
DATE 2·5·92

COMP NO.	K 36	–	–	–	–	–	–	–
LOCATION	LTS-1	–	–	–	–	–	–	–
START TIME	9:30	10:50	12:00	1:15	2:30	3:45	5:00	6:15
END TIME	10:30	11:50	1:00	2:15	3:30	4:45	6:00	6:40
FUEL GAS METER DATA								
COEFFICIENT	.017	–	–	–	–	–	–	–
STATIC	7.45	7.45	7.45	7.4	7.4	7.4	7.4	7.4
DIFF.	6.4	6.4	6.45	6.4	6.4	6.4	6.4	6.4
MCF/D	811	811	817	805	805	805	805	805
COMPRESSOR OPERATION PARAMETERS								
SUC PRESS.	385	380	380	380	380	375	375	375
DISCH PRESS.	2650	2650	2650	2650	2650	2650	2650	2650
RATED HP.	5500	–	–	–	–	–	–	–
TESTED HP.	4532	–	4133	–	4210	–	4305	–
% LOAD	83	–	76	–	77	–	79	–
RPM	347	–	346	–	347	–	347	–
SPARK	12.0	–	–	–	–	–	–	–
AIR-MANIFOLD PRESS.	30.3	30.8	30.1	29.1	29.8	30.3	30.3	29.8
GAS PRESS.	30.2	30.3	29.9	29.0	29.5	29.5	29.5	29.5
PRELIMINARY SOURCE TEST DATA (IN GR/BHP-HR AND LBS-HR)								
EF GAS	9.6	–	–	–	–	–	–	–
O2 %	13.75	13.6	13.5	13.5	13.75	13.75	13.9	13.75
DSCFM	15796	15471	15381	15159	15690	15690	16025	15689
PPM NOx	80	82	93	93	78	68	63	60
LBS-HR NOx	9.19	9.23	10.40	10.25	8.90	7.76	7.34	6.85
GR/BHP-HR	.92	.92	1.14	1.13	.96	.84	.77	.72
PPM CO	545	550	520	520	545	580	580	580
LBS-HR CO	38.11	37.67	35.41	34.90	37.85	40.28	41.15	40.28
GR/BHP-HR	3.82	3.77	3.89	3.83	4.08	4.34	4.34	4.25

I.C. ENGINE SOURCE TEST REPORT

COMPANY - Naval Petroleum Reserve No. 1 DATE - 2-5-92

APCD/EPA NUMBERS - 4091023 B

REASON FOR TEST - Air Toxics TEST COMPANY - BPOI

EQUIPMENT DESCRIPTION - 5500 HP Ingersoll-Rand

NOx CONTROL - CAT. CONV. ___ PSC ___ PCC ✓ O2 ___

POLLUTANTS TESTED - PM ___ SO4 ___ SO2 ___ NOX ✓ CO ✓ H2S ___ HC ✓

APPLICABLE RULES - 210.1 ___ 427 ___ VEE PERFORMED - YES ✓ NO ___

ENGINE LOCATION - Sec 35 / T30S / R23E

		1	2	3	4	5	6
TIME		10:00	11:20	12:30	1:45	3:00	4:15
RPM		347	347	346	346	347	347
HORSEPOWER		4532	4532	4133	4133	4210	4210
CATALYST TEMP.							
FUEL	READING	7.45 / 6.4	7.45 / 6.4	7.45 / 6.45	7.4 / 6.4	7.4 / 6.4	7.4 / 6.4
	RATE	811	811	817	805	805	805
SUCTION	PRESS. 1	385	380	380	380	380	375
	PRESS. 2						
DISCHARGE	PRESS. 1	2650	2650	2650	2650	2650	2650
	PRESS. 2						

FUEL TYPE natural gas Average FUEL RATE - 809 % OF LOAD 112-83 / 74-76 FUEL COEF. .017

POLLUTANT	SPAN GAS	RANGE	INSTR. ANALYSIS	INSTR. MFG.
NOx	233	0-250		Teco 10
CO	208.5	0-1000		Teco 48
O2	15 %	0-25		Teledyne
Cal Gas Expiration	NOx 4-1-92	CO 4-1-92	O2 N/A	
SPAN / ZERO DRIFT < 5% OF RANGE - YES ( ) NO ( )				

	1	2	3	4	5	6		
TIME	9:30 / 10:30	10:50 / 11:50	12:00 / 1:00	1:15 / 2:15	2:30 / 3:30	3:45 / 4:45		
NOx	80	82	93	93	78	68		
CO	545	550	520	520	545	580		
O2	13.75	13.6	13.5	13.5	13.75	13.75		

COMMENTS -

OBSERVER - M. Carr

Petro Chem Environmental Services, Inc.

I.C. ENGINE SOURCE TEST REPORT

COMPANY - Naval Petroleum Reserve No. 1 DATE - 2-5-92

APCD/EPA NUMBERS - 4091023 B

REASON FOR TEST - Air Toxics TEST COMPANY - BPOI

EQUIPMENT DESCRIPTION - 5500 HP Ingersoll-Rand

NOx CONTROL - CAT. CONV. ___ PSC ___ PCC ✓ O2 ___

POLLUTANTS TESTED - PM ___ SO4 ___ SO2 ___ NOX ✓ CO ✓ H2S ___ HC ✓

APPLICABLE RULES - 210.1 ___ 427 ___ VEE PERFORMED - YES ✓ NO ___

ENGINE LOCATION - Sec 35/T30S/R23E

		7	8				
TIME		5:30	6:20				
RPM		347	347				
HORSEPOWER		4305	4305				
CATALYST TEMP.							
FUEL	READING	7.4 / 6.4	7.4 / 6.4				
	RATE	805	805				
SUCTION	PRESS. 1	375	375				
	PRESS. 2						
DISCHARGE	PRESS. 1	2650	2650				
	PRESS. 2						

FUEL TYPE natural gas FUEL RATE - 805 % OF LOAD 7&8-79 FUEL COEF. .017

POLLUTANT	SPAN GAS	RANGE	INSTR. ANALYSIS	INSTR. MFG.
NOx	233	0-250		Teco 10
CO	208.5	0-1000		Teco 48
O2	15%	0-25		Teledyne
Cal Gas Expiration	NOx 4-1-92	CO 4-1-92		
SPAN / ZERO DRIFT < 5% OF RANGE - YES ( ) NO ( )				

	7	8						
TIME	5:00 / 6:00	6:15 / 6:40						
NOx	63	60						
CO	580	580						
O2	13.9	13.75						

COMMENTS -

OBSERVER - M. Carr

Petro Chem Environmental Services, Inc.

COMPRESSOR PERFORMANCE REPORT

BECHTEL PETROLEUM OPERATIONS, INC.

Location : ELK HILLS, CA

Unit Mfr : INGERSOLL-RAND Model: KVR 616

Unit name: K36 Date: 5-Feb-92 09:30:23

CYL	SERVICE (stage)	CLR SET (%)	PRESSURES Ps (psi)	PRESSURES Pd (psi)	TEMPS SU (dg F)	TEMPS DIS (dg F)	CALC CAPACITY (MMSCFD)	IHP (hp)	DIS T DELTA (dg F)	ROD LOAD (%)
1H	2ndStageIn	10	1385.8	2823.8	61	231	18.81	742.7	193	80C
1C	2ndStageIn	10	1388.8	2822.8	61	231	11.73	417.5	194	21T
2H	1stStageIn	10	371.3	1494.0*	53	227	8.12	531.3	11	111C
2C	1stStageIn	10	374.0	1487.3*	53	227	8.29	543.5	14	86T
3H	1stStageIn	10	379.0	1463.0*	53	232	8.11	509.4	26	110C
3C	1stStageIn	10	378.8	1466.8*	53	232	8.34	530.1	26	84T
4H	2ndStagePr	10	45.1	187.1*	-27	178	.97	200.9	129	79C
4C	2ndStagePr	10	43.5	177.9*	-27	178	6.41	404.4	132	77T
5H	1stStagePr	10	5.5	60.6*	-15	83	1.35	105.2	-4	33C
5C	1stStagePr	10	4.4	57.9*	-15	83	.02	64.7	-5	28T
6H	1stStagePr	10	4.5	55.8*	-15	83	1.92	182.4	-1	32C
6C	1stStagePr	10	4.3	51.1*	-15	83	.65	73.0	5	27T

Total indicated horsepower (IHP) = 4305 @ 347 RPM
Gas horsepower (GHP) = 4532 @ 347 RPM
Compressor total horsepower (BHP) = 4532 @ 347 RPM
Rated horsepower (BHP) = 5500 @ 350 RPM
Derated horsepower (BHP) = 5447 for 347 RPM
Percent Load = 83%

* WARNING: Check the measured line pressures

Recommendations and Observations:
CONTINUOUS EMISSIONS MONITORING DURING AIR TOXIC EVALUATION.RUN 1 & 2.
HP'S TAKEN EVERY OTHER RUN.

Analyst signature: _____

Petro Chem Environmental Services, Inc.

COMPRESSOR PERFORMANCE REPORT

BECHTEL PETROLEUM OPERATIONS, INC.

Location : ELK HILLS, CA

Unit Mfr : INGERSOLL-RAND Model: KVR 616

Unit name: K36 Date: 5-Feb-92 12:04:29

CYL	SERVICE (stage)	CLR SET (%)	PRESSURES Ps (psi)	PRESSURES Pd (psi)	TEMPS SU (dg F)	TEMPS DIS (dg F)	CALC CAPACITY (MMSCFD)	IHP (hp)	DIS T DELTA (dg F)	ROD LOAD (%)
1H	2ndStageIn	10	1303.7	2815.0	61	231	17.44	738.0	181	82C
1C	2ndStageIn	10	1316.0	2831.3	61	231	10.75	409.0	182	23T
2H	1stStageIn	10	369.6	1440.3*	53	227	7.56	472.9	17	105C
2C	1stStageIn	10	369.5	1421.5	53	227	7.74	494.8	19	80T
3H	1stStageIn	10	370.8	1392.8	53	232	7.69	474.8	30	103C
3C	1stStageIn	10	374.0	1402.0	53	232	7.67	485.0	31	78T
4H	2ndStagePr	10	41.3	185.3*	-27	178	.17	111.7	122	78C
4C	2ndStagePr	10	39.8	176.3*	-27	178	4.84	316.4	125	77T
5H	1stStagePr	10	4.7	54.3*	-15	83	1.32	93.7	2	31C
5C	1stStagePr	10	6.5	63.5	-15	83	0.0	58.6	Unloaded	31T
6H	1stStagePr	10	6.2	63.9*	-15	83	1.60	193.5	-6	33C
6C	1stStagePr	10	5.6	55.6*	-15	83	.70	77.6	4	29T

Total indicated horsepower (IHP) = 3926 @ 346 RPM
Gas horsepower (GHP) = 4133 @ 346 RPM
Compressor total horsepower (BHP) = 4133 @ 346 RPM
Rated horsepower (BHP) = 5500 @ 350 RPM
Derated horsepower (BHP) = 5437 for 346 RPM
Percent Load = 76%

* WARNING: Check the measured line pressures

Recommendations and Observations:
CONTINUOUS EMISSIONS MONITORING DURING AIR TOXIC EVALUATION.RUN 3 & 4.
HP'S TAKEN EVERY OTHER RUN.

Analyst signature: _____

Petro Chem Environmental Services, Inc.

COMPRESSOR PERFORMANCE REPORT

BECHTEL PETROLEUM OPERATIONS, INC.

Location : ELK HILLS, CA

Unit Mfr : INGERSOLL-RAND Model: KVR 616

Unit name: K36 Date: 5-Feb-92 14:23:28

CYL	SERVICE (stage)	CLR SET (%)	PRESSURES Ps (psi)	PRESSURES Pd (psi)	TEMPS SU	TEMPS DIS (dg F)	CALC CAPACITY (MMSCFD)	IHP (hp)	DIS T DELTA (dg F)	ROD LOAD (%)
1H	2ndStageIn	10	1312.8	2778.8	61	231	17.72	750.6	183	81C
1C	2ndStageIn	10	1304.3	2790.3	61	231	10.83	406.6	181	23T
2H	1stStageIn	10	365.3	1421.3	53	227	8.00	505.6	17	105C
2C	1stStageIn	10	369.3	1422.6	53	227	7.84	510.5	19	81T
3H	1stStageIn	10	369.5	1395.5	53	232	7.87	486.5	29	103C
3C	1stStageIn	10	369.3	1413.3	53	232	8.15	509.1	27	79T
4H	2ndStagePr	10	39.6	181.1*	-27	178	.90	98.5	121	78C
4C	2ndStagePr	10	37.9	171.1*	-27	178	4.94	316.4	124	76T
5H	1stStagePr	10	4.6	53.8*	-15	83	1.33	98.5	2	31C
5C	1stStagePr	10	5.8	60.1*	-15	83	.02	56.5	-2	30T
6H	1stStagePr	10	5.5	58.3*	-15	83	2.25	188.1	0	33C
6C	1stStagePr	10	5.5	51.9*	-15	83	.65	72.8	9	27T

Total indicated horsepower (IHP) = 4000 @ 347 RPM
Gas horsepower (GHP) = 4210 @ 347 RPM
Compressor total horsepower (BHP) = 4210 @ 347 RPM
Rated horsepower (BHP) = 5500 @ 350 RPM
Derated horsepower (BHP) = 5452 for 347 RPM
Percent Load = 77%

* WARNING: Check the measured line pressures

Recommendations and Observations:
CONTINUOUS EMISSIONS MONITORING DURING AIR TOXIC EVALUATION.RUN 5 & 6.
HF'S TAKEN EVERY OTHER RUN.

Analyst signature: _____

Petro Chem Environmental Services, Inc.

COMPRESSOR PERFORMANCE REPORT

BECHTEL PETROLEUM OPERATIONS, INC.

Location : ELK HILLS, CA

Unit Mfr : INGERSOLL-RAND Model: KVR 616

Unit name: K36 Date: 5-Feb-92 17:05:08

CYL	SERVICE (stage)	CLR SET (%)	PRESSURES Ps (psi)	PRESSURES Pd (psi)	TEMPS SU (dg F)	TEMPS DIS (dg F)	CALC CAPACITY (MMSCFD)	IHP (hp)	DIS T DELTA (dg F)	ROD LOAD (%)
1H	2ndStageIn	10	1303.8	2789.8	61	231	17.91	760.4	181	81C
1C	2ndStageIn	10	1310.3	2807.6	61	231	11.14	421.3	182	23T
2H	1stStageIn	10	361.3	1411.3	53	227	8.01	537.5	16	106C
2C	1stStageIn	10	359.8	1419.8	53	227	7.91	522.6	14	82T
3H	1stStageIn	10	362.5	1398.5	53	232	8.08	509.9	25	103C
3C	1stStageIn	10	365.3	1401.3	53	232	8.32	522.4	26	79T
4H	2ndStagePr	10	40.5	188.3*	-27	178	1.02	96.6	118	83C
4C	2ndStagePr	10	39.6	183.0*	-27	178	5.18	331.1	120	83T
5H	1stStagePr	10	3.9	51.9*	-15	83	1.28	97.1	3	30C
5C	1stStagePr	10	2.9	53.1	-15	83	0.0	54.4	Unloaded	26T
6H	1stStagePr	10	3.4	54.9*	-15	83	2.17	175.0	-5	30C
6C	1stStagePr	10	4.8	55.0*	-15	83	.72	61.6	1	30T

Total indicated horsepower (IHP) = 4090 @ 347 RPM
Gas horsepower (GHP) = 4305 @ 347 RPM
Compressor total horsepower (BHP) = 4305 @ 347 RPM
Rated horsepower (BHP) = 5500 @ 350 RPM
Derated horsepower (BHP) = 5456 for 347 RPM
Percent Load = 79%

* WARNING: Check the measured line pressures

Recommendations and Observations:
CONTINUOUS EMISSIONS MONITORING DURING AIR TOXIC EVALUATION.RUN 7 & 8.
HP'S TAKEN EVERY OTHER RUN.

Analyst signature: MXB

Petro Chem Environmental Services, Inc.