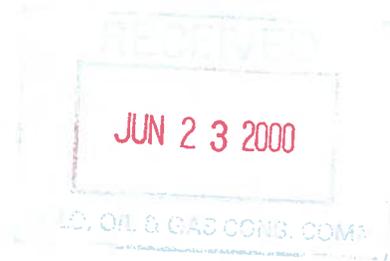




770 Simms Street
Suite 110
Golden, CO 80401
T: 303.237.2072
F: 303.237.2659



June 13, 2000

Mr. Robert H. Chesson, C.P.G.
Environmental Protection Specialist
Colorado Oil & Gas Conservation Commission
1120 Lincoln Street; Suite 801
Denver, Colorado 80203

RE: Report of Groundwater Sampling at #1 Dutch Abandoned Well Site; API 05-013-06235. COGCC Site Investigation and Remediation No. 355.

Dear Mr. Chesson:

The Colorado Oil & Gas Conservation Commission (COGCC) retained Cordilleran Compliance Services (Cordilleran) to complete limited groundwater sampling at the above-referenced abandoned well site located on the south side of Plateau Road in Boulder County, Colorado. Figure 1 shows the general site location. The COGCC requested the sampling to further evaluate potential impacts to groundwater at the site that were suggested by a previous subsurface investigation completed by A.G. Wassenaar, Inc. (AGW) in 1999.

The AGW investigation included the installation and sampling of nine direct push borings and groundwater monitoring wells spaced from 10 to 20 feet apart at the former well site. The boring logs for all of the AGW borings (except BH-5) indicate that the soil from the ground surface to a depth of approximately 12 or 13 feet below ground surface (bgs) was not stained or otherwise impacted by hydrocarbons. The AGW report indicated benzene in one groundwater sample (BH-1) collected at the former well site at a concentration of 16 micrograms per liter ($\mu\text{g/L}$). All other results were either less than the detection limits and/or less than the regulatory action levels.

Based on the results of the AGW investigation, the COGCC was confident that the extent of the hydrocarbon-impacted soil was delineated at the former well site. Therefore, the focus of the additional sampling requested by the COGCC was to further evaluate the extent of the benzene in the groundwater near AGW boring BH-1. The scope of work initially requested by the COGCC was described in a letter dated May 10, 2000 and was modified slightly based on our conversation with you on May 23, 2000. The following sections summarize the field sampling activities and results of the groundwater sampling completed by Cordilleran.



02158791

FIELD SAMPLING ACTIVITIES

On Friday June 2, 2000 Cordilleran mobilized to the site to complete the well construction and groundwater sampling activities requested by the COGCC. Upon arriving on site Cordilleran used site maps and a surveying wheel to find the abandoned well site and the AGW boring locations. A wooden stake labeled "Approximate Location #1 Dutch Well" was found approximately 120 feet south of Plateau Road and 230 feet west of the northeast corner of the property. The ground surface at the site slopes to the south towards an irrigation ditch at a five to six percent slope.

Cordilleran retained Drill Pro to provide personnel and a truck-mounted direct-push sampling rig to advance the seven soil borings at the site for the construction of temporary mini-wells. All field activities were performed in Level D protective clothing including steel-toed boots, hardhats, and safety glasses.

As shown on Figure 2 – Site Map, the borings were advanced at the locations proposed by the COGCC. Boring/temporary well TW-1 was located next to AGW boring BH-1. The remaining six borings/temporary wells were located along two transects located down gradient (south) of TW-1 with three borings on each transect. One of the transects was situated 50 feet south of TW-1 and the other located 150 feet south of TW-1.

Soil samples were collected continuously as the borings were advanced using a Hurricane direct-push sampler. The soil samples were collected in clear one-inch diameter plastic sleeves. The soil cuttings were logged and screened in the field using a photoionization detector (PID), but no soil samples were submitted for laboratory analysis. Lithologic logs of the geologic materials encountered in each boring are included in Attachment 1. Photographs of the site are included in Attachment 2.

The seven borings were advanced to a depth of approximately 16 feet bgs. In general, the soil encountered at the site consisted of 3 to 5 feet of fine to very fine clayey sand, overlying 8 to 12 feet of sandy clay, overlying 1 to 4 feet of fine to coarse sand. No hydrocarbon odor or staining was noted on the soil samples and no elevated PID readings were observed. Groundwater was encountered in the borings at depths from 9 to 10.5 feet bgs. Soil cuttings did not require containment or disposal and were left on-site.

When the borings were advanced to the desired depth of approximately 16 feet bgs a temporary mini-well was constructed in each boring. The mini-wells consisted of 10 feet of one-inch diameter poly-vinyl chloride (PVC), machine slotted screen placed across the water table and blank PVC riser pipe to the ground surface. Well sand (#10-20 Colorado Silica) was placed in the annulus to a depth of one foot above the top of the screen and bentonite was placed in the annulus on top of the sand to the ground surface.

The depth to water (bgs) was measured in each well. The water level measurements are summarized in Table 1. Based on the depth to water measurements and estimated ground surface elevations at the site, the groundwater flow direction is generally to the south.

After the water level measurements were recorded a check-valve pump was used to develop the wells by removing one to three gallons of water from each well. Groundwater quality parameters including temperature, pH, and conductivity were monitored during well development. The groundwater quality parameters are included in Table 1.

After well development was completed, Cordilleran collected the groundwater samples in clean glassware provided by the laboratory. The sample containers were labeled with the sample identification number, the time and date of sampling, and placed in a cooler with ice under chain of custody. Cordilleran hand delivered the samples to Evergreen Analytical. The requested analysis included benzene, toluene, ethylbenzene and xylenes (BTEX) by EPA method 8021.

LABORATORY RESULTS

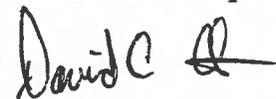
The laboratory results for the groundwater samples from temporary wells TW-2, TW-3, TW-4, TW-5, TW-6 and TW-7 indicated that the BTEX constituents were less than the method detection limits. The laboratory results for the groundwater sample from TW-1 indicated benzene at a concentration of 2.9 µg/L, ethylbenzene at 7 µg/L and xylenes at 23 µg/L. Toluene was less than the method detection limits. No BTEX constituents were reported at concentrations in excess of the Maximum Contaminant Levels (MCL) established for drinking water. A summary of the laboratory results for the groundwater samples is provided in Table 2. Copies of the laboratory reports are included in Attachment 3.

Based on the results of the 1999 AGW site assessment and the June 2000 groundwater sampling completed by Cordilleran at the site, it appears that no further action is required at this site.

Thank you for the opportunity to assist you with this project. We look forward to working with you in the future. If you have any questions, please call us at (303) 237-2072.

Sincerely,

Cordilleran Compliance Services



David C. Cloutier
Senior Project Manager



F05 J.D.L
John D. Lohner
Principal Geologist

Table 1
Water Level Measurements and Water Quality Parameters

Well ID	Depth to Water (Feet bgs)	Temperature (Degrees Centigrade)	pH	Conductivity
TW-1	11.37	*	*	*
TW-2	11.80	13.5	6.99	1418
TW-3	10.61	12.8	7.03	1438
TW-4	10.71	*	7.29	1628
TW-5	9.01	13.0	7.1	1693
TW-6	9.06	12.3	7.14	1590
TW-7	8.50	12.0	7.2	1687

Notes:

* = Well bailed dry, not enough sample to run parameter

bgs = below ground surface

The ground surface at wells TW-5, TW-6 and TW-7 is approximately 5 to 6 feet lower than the ground surface at wells TW-2, TW-3 and TW-4.

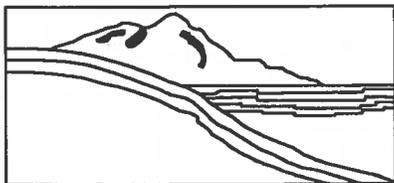
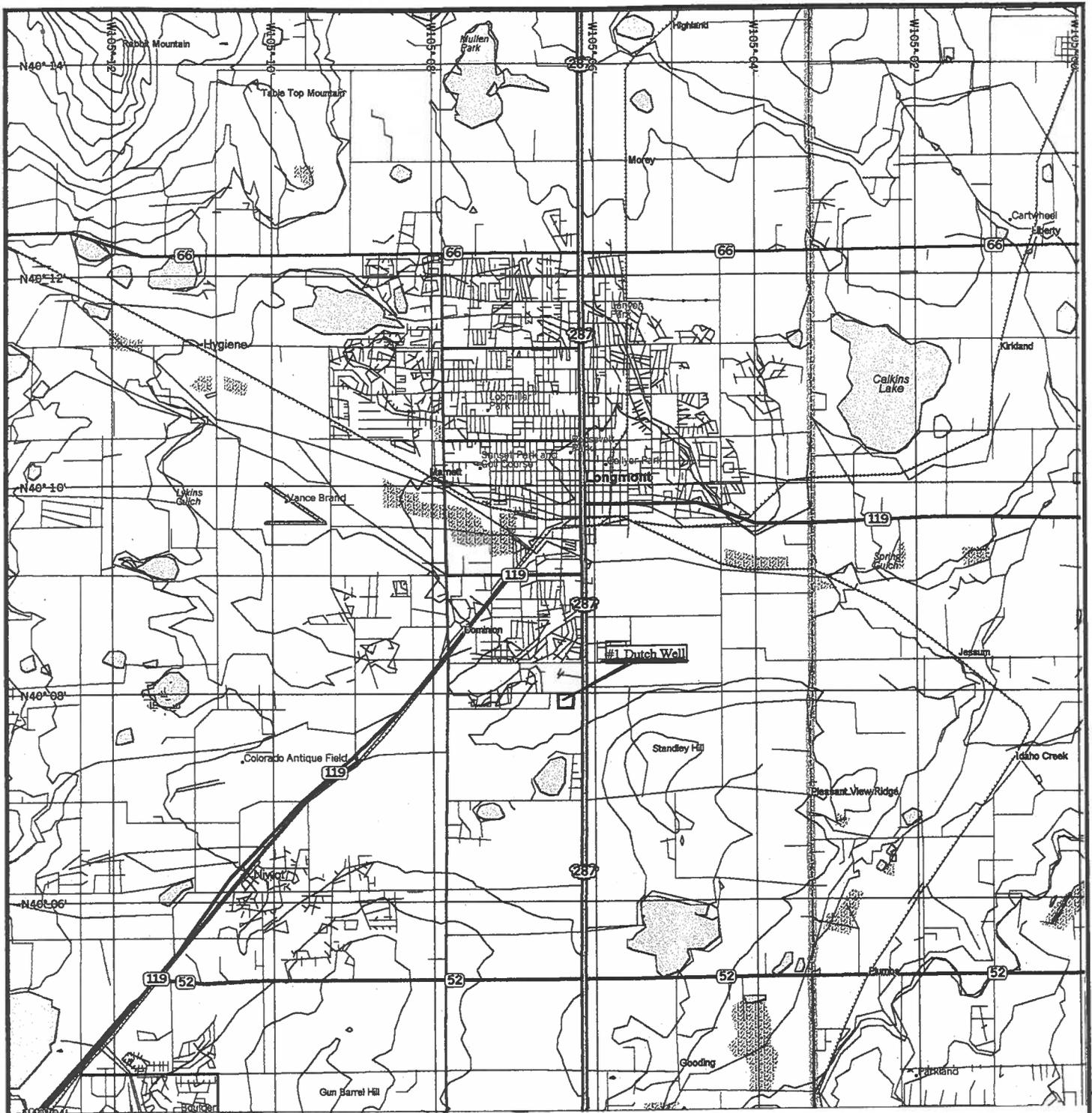
Table 2
Summary of Laboratory Results for Groundwater Samples

Well ID	Benzene	Toluene	Ethylbenzene	Xylenes
TW-1	2.9 µg/L	ND	7.0 µg/L	23 µg/L
TW-2	ND	ND	ND	ND
TW-3	ND	ND	ND	ND
TW-4	ND	ND	ND	ND
TW-5	ND	ND	ND	ND
TW-6	ND	ND	ND	ND
TW-7	ND	ND	ND	ND

Notes:

µg/L = micrograms per Liter

ND = Not detected at the method detection limit



**Cordilleran
Compliance
Services, Inc.**



**Figure 1
General Site Location Map
#1 Dutch Abandoned Well Site
Boulder County, Colorado**

Prepared For:
COGCC

PLATEAU ROAD

~120'

APPROXIMATE LOCATION OF #1 DUTCH WELL STAKE

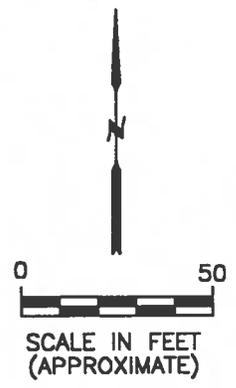
TW-1
BH-1

50'

TW-2 TW-3 TW-4

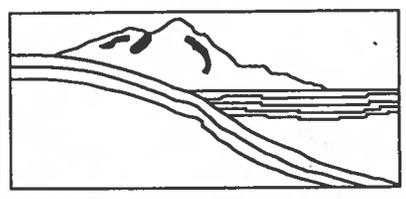
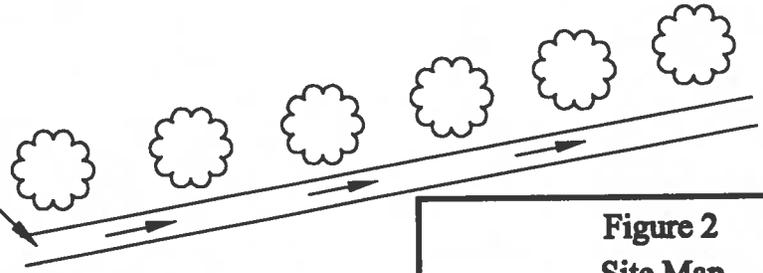
100'

TW-5 TW-6 TW-7



HIGHWAY 287
1/4 MILE

IRRIGATION DITCH



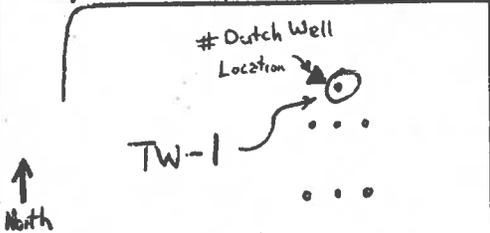
**Cordilleran
Compliance
Services, Inc.**

**Figure 2
Site Map
#1 Dutch Abandoned Well Site
Boulder County, Colorado**
Prepared For:
COGCC

Attachment 1
Boring Logs

LOCATION MAP

Plateau Road



US 287



Cordilleran Compliance Services, Inc.

Office Address & Phone:

TEST HOLE/WELL LOG

Page 1 of 1

Test/Well Number: TW-1

Project: #1 Dutch Abandoned Well

Date: 6/2/00

Project Number:

Logged By: D. Cloutier

Drilled By: Drill Pro

Elevation:

Detector:

Drilling Method: Direct Push

Sampling Method: Continuous

Gravel Pack:

Seal:

Length:

Grout:

Casing Type:

Diameter:

Length:

Hole Dia.:

Depth to Liquid:

Screen Type:

Diameter:

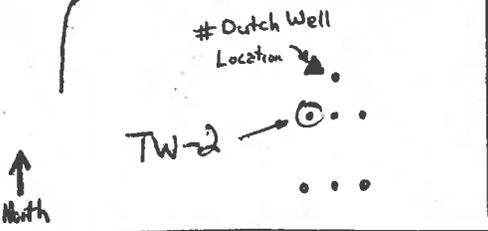
Total Depth:

Depth to Water:

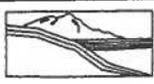
Moisture Content	% Fines	Vapor (ppm)	Staining	Sample #	Depth (bgs)	Sample Recovery	Penetration Resistance	LITHOLOGY/REMARKS	WELL COMPLETION
					0			Sand, fine to very fine, clayey to very clayey, silty, brown	
					1				
					2				
					3				
					4			Clay, silty to very silty, sandy to very sandy brown to tan	
					5				
					6				
					7				
					8				
					9				
					10			- wet - w5	
					11			very sandy (fine)	
					12				
					13				
					14				
					15			Sand, fine to coarse, clayey, gravelly	
					16			Total Depth	

LOCATION MAP

Plateau Road



US 287



Cordilleran Compliance Services, Inc.

Office Address & Phone:

TEST HOLE/WELL LOG

Page 1 of 1

Test/Well Number: TW-2

Project: #1 Dutch Abandoned Well

Date: 6/2/00

Project Number:

Logged By: D. Cloutier

Drilled By: Drill Pro

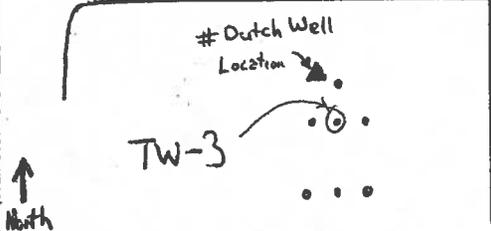
Elevation:	Detector:	Drilling Method: Direct Push	Sampling Method: Continuous
Gravel Pack:	Seal:	Length:	Grout:
Casing Type:	Diameter:	Length:	Hole Dia.: Depth to Liquid:
Screen Type:	Diameter:	Total Depth:	Depth to Water:

Moisture Content	% Fines	Vapor (ppm)	Staining	Sample #	Depth (bgs)	Sample Recovery	Penetration Resistance	LITHOLOGY/REMARKS	WELL COMPLETION
					0			Sand, fine to very fine, clayey to very clayey, silty, brown	bentrite
					1				
					2				
		0.0			3			Clay, silty to very silty, sandy to very sandy brown to tan	sand pack
					4				
		0.2			5				
					6				
					7				
		0.2			8			wet ~ 10.5'	screen
					9				
					10				
		0.2			11				
					12			Sand, fine to coarse, clayey, gravelly	Total Depth
					13				
		0.2			14				
					15				
					16				

11.80

LOCATION MAP

Plateau Road



US 287



Cordilleran Compliance Services, Inc.

Office Address & Phone:

TEST HOLE/WELL LOG

Page 1 of 1

Test/Well Number: TW-3

Project #1 Dutch Abandoned Well

Date: 6/2/00

Project Number:

Logged By: D. Cloutier

Drilled By: Drill Pros

Elevation:

Detector:

Drilling Method: Direct Push

Sampling Method: Continuous

Gravel Pack:

Seal:

Length:

Grout:

Casing Type:

Diameter:

Length:

Hole Dia.:

Depth to Liquid:

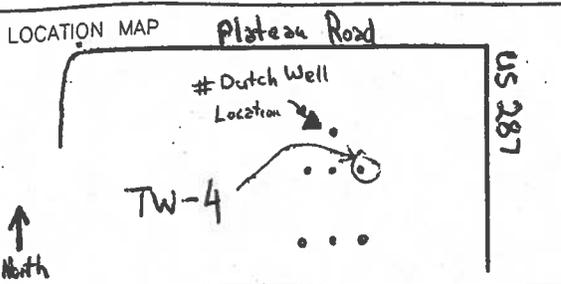
Screen Type:

Diameter:

Total Depth:

Depth to Water:

Moisture Content	% Fines	Vapor (ppm)	Staining	Sample #	Depth (bgs)	Sample Recovery	Penetration Resistance	LITHOLOGY/REMARKS	WELL COMPLETION
					0			Sand, fine to very fine, clayey to very clayey, silty, brown	bentonite
					1				
					2				
					3			Clay, silty to very silty, sandy to very sandy brown to tan	sand pack
	0.0				4				
					5				
					6				
					7				
					8			- wet ~ 10 ft	screen
	0.0				9				
					10				
					11				
					12			Sand, fine to coarse, clayey, gravelly	10.4
	0.0				13				
					14				
					15			Total Depth	
					16				



 Cordilleran Compliance Services, Inc. Office Address & Phone:

TEST HOLE/WELL LOG Page 1 of 1

Test/Well Number: TW-4 Project: #1 Dutch Abandoned Well

Date: 6/2/00 Project Number:

Logged By: D. Cloutier Drilled By: Drill Pro

Elevation: _____ Detector: _____ Drilling Method: Direct Push Sampling Method: Continuous

Gravel Pack: _____ Seal: _____ Length: _____ Grout: _____

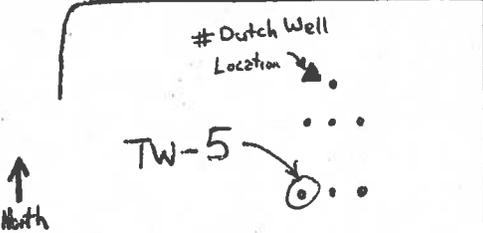
Casing Type: _____ Diameter: _____ Length: _____ Hole Dia.: _____ Depth to Liquid: _____

Screen Type: _____ Diameter: _____ Total Depth: _____ Depth to Water: _____

Moisture Content	% Fines	Vapor (ppm)	Staining	Sample #	Depth (bgs)	Sample Recovery	Penetration Resistance	LITHOLOGY/REMARKS	WELL COMPLETION	
					0			Sand, fine to very fine, clayey to very clayey, silty, brown	bentonite	
					1					
					2					
		0.0			3			Clay, silty to very silty, sandy to very sandy brown to tan		
					4					
					5					
		0.0			6					
					7					
					8			- wat ~ 10ft	sand pack	10.71
					9					
		0.0			10					
					11					
					12			Sand, fine to coarse, clayey, gravelly	screen	
					13					
		0.0			14					
					15					
					16			Total Depth		

LOCATION MAP

Plateau Road



US 287



Cordilleran Compliance Services, Inc.

Office Address & Phone:

TEST HOLE/WELL LOG

Page 1 of 1

Test/Well Number: TW-5

Project: #1 Dutch Abandoned Well

Date: 6/2/00

Project Number:

Logged By: D. Cloutier

Drilled By: Drill Pro

Elevation:

Detector:

Drilling Method: Direct Push

Sampling Method: Continuous

Gravel Pack:

Seal:

Length:

Grout:

Casing Type:

Diameter:

Length:

Hole Dia.:

Depth to Liquid:

Screen Type:

Diameter:

Total Depth:

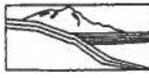
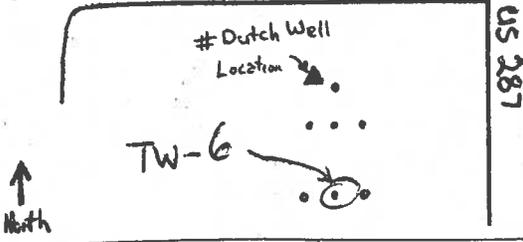
Depth to Water:

Moisture Content	% Fines	Vapor (ppm)	Staining	Sample #	Depth (bgs)	Sample Recovery	Penetration Resistance	LITHOLOGY/REMARKS	WELL COMPLETION	
					0			Sand, fine to very fine, clayey to very clayey, silty, brown		benthoite
					1					
					2			Clay, silty to very silty, sandy to very sandy brown to tan		
		0.0			3					
					4					
					5					
					6			- Wet - 10 ft		
		0.0			7					
					8					
					9					
					10			Sand, fine to coarse, clayey, brown		sand pack
		0.0			11					
					12			Sand, fine to coarse, clayey, gravelly		screen
					13					
					14					
					15					
					16			Total Depth		

9.01

LOCATION MAP

Plateau Road



Cordilleran Compliance Services, Inc.

Office Address & Phone:

TEST HOLE/WELL LOG

Page 1 of 1

Test/Well Number: TW-6

Project: #1 Dutch Abandoned Well

Date: 6/2/00

Project Number:

Logged By: D. Cloutier

Drilled By: Drill Pro

Elevation:

Detector:

Drilling Method: Direct Push

Sampling Method: Continuous

Gravel Pack:

Seal:

Length:

Grout:

Casing Type:

Diameter:

Length:

Hole Dia.:

Depth to Liquid:

Screen Type:

Diameter:

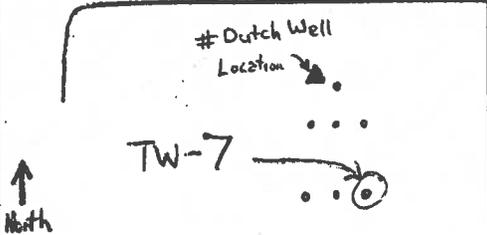
Total Depth:

Depth to Water:

Moisture Content	% Fines	Vapor (ppm)	Staining	Sample #	Depth (bgs)	Sample Recovery	Penetration Resistance	LITHOLOGY/REMARKS	WELL COMPLETION	
					0			Sand, fine to very fine, Clayey to very clayey, silty, brown	bentonite	
					1					
					2					
					3					
					4					
					5			Clay, silty to very silty, Sandy, brown to tan		
					6					
					7			- Wet ~10.5	sand pack	9.06
					8					
					9					
					10					
					11			Sand, fine to coarse, clayey, gravelly	screen	
					12					
					13					
					14			Total Depth		
					15					
					16					

LOCATION MAP

Plateau Road



US 287



Cordilleran Compliance Services, Inc.

Office Address & Phone:

TEST HOLE/WELL LOG

Page 1 of 1

Test/Well Number: TW-7

Project #1 Dutch Abandoned Well

Date: 6/2/00

Project Number:

Logged By: D. Cloutier

Drilled By: Drill Pro

Elevation:

Detector:

Drilling Method: Direct Push

Sampling Method: Continuous

Gravel Pack:

Seal:

Length:

Grout:

Casing Type:

Diameter:

Length:

Hole Dia.:

Depth to Liquid:

Screen Type:

Diameter:

Total Depth:

Depth to Water:

Moisture Content	% Fines	Vapor (ppm)	Staining	Sample #	Depth (bgs)	Sample Recovery	Penetration Resistance	LITHOLOGY/REMARKS	WELL COMPLETION	
					0			Sand, fine to very fine, clayey to very clayey, silty, brown	bentonite	
					1					
					2			Clay, silty to very silty, sandy to very sandy brown to tan		
					3					
					4					
					5					
					6					
					7			- wet ~ 10.5	sand pack	
					8					
					9					
					10			Sand, fine to coarse, clayey to very clayey brown	screen	
					11					
					12			Sand, fine to coarse, clayey, gravelly		
					13					
					14					
					15			Total Depth		
					16					

Attachment 2
Site Photographs



Photo 1 – Stake marking approximate location of Dutch #1 Well. Well TW-1 in background.



Photo 2 – Location of #1 Dutch well (at stake), TW-1 at left, drilling TW-5 in background.



Photo 3 – Looking east along transect 1, 50 feet south of TW-1

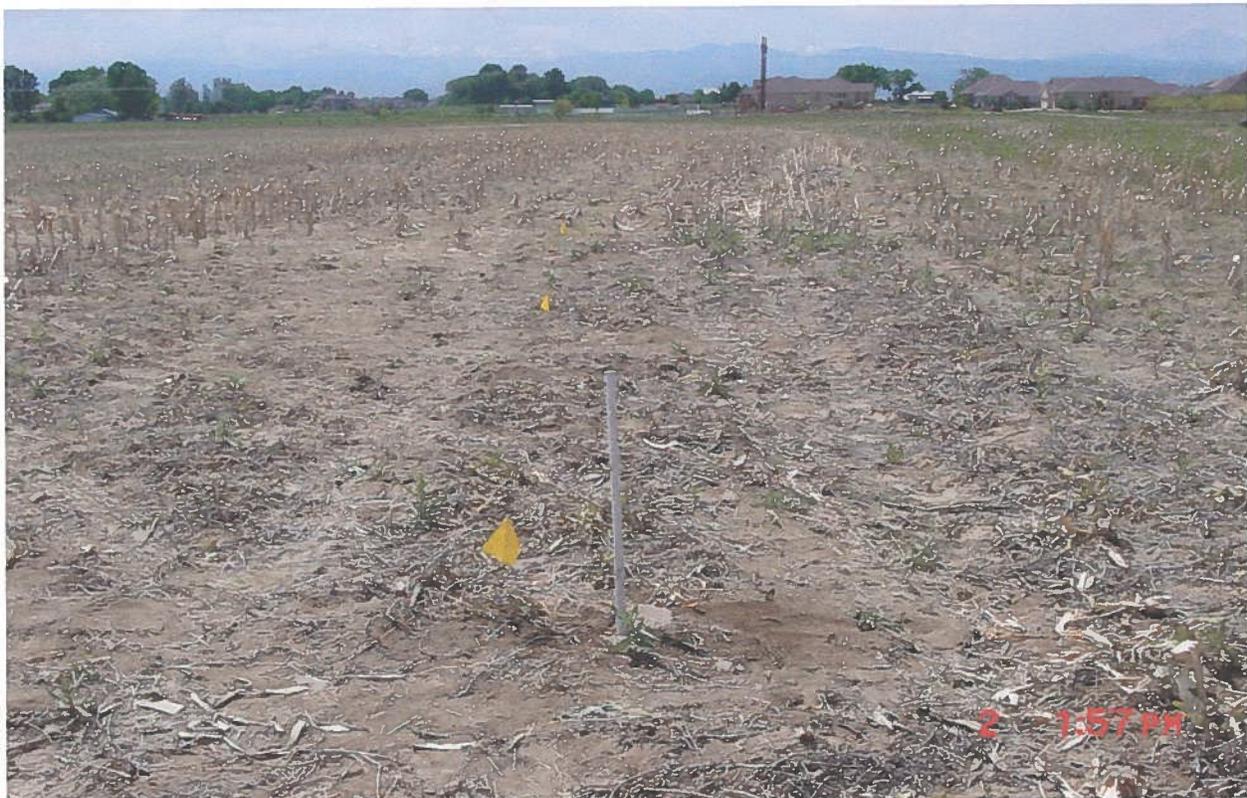
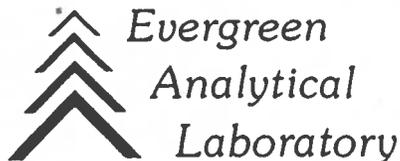


Photo 4 – Looking west along transect 2, 150 feet south of TW-1.

Attachment 3
Laboratory Reports



June 08, 2000

DAVE CLOUTIER
CORDILLERAN COMPLIANCE SERVICES, INC.
770 SIMMS STREET SUITE 110
GOLDEN, CO 80401

Lab Work Order: 00-2813
Client Project: COGCC-#1Dutch Well

Dear Dave Cloutier:

Enclosed are the analytical results for the samples shown in the Laboratory Work Order Summary. The enclosed data have been reviewed for quality assurance. If you have any questions concerning the reported information, please contact me.

Yes	No	NA*	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	The samples received in good condition within EPA holding times.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Custody seals present. Seal intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Samples preserved to acceptable pH levels.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Samples analyzed within holding times per the analytical method.
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	A case narrative explaining analytical anomalies is attached.

NA*=not applicable

The temperature of the sample(s) upon arrival was 8 degrees C.

This report contains a total of 23 pages including the cover letter.

SAMPLE DISPOSAL: Except for high level mercury (>260 ppm) samples, EAL will dispose of all samples one month from the date of this letter. If you want samples returned, please advise us by mail or fax as soon as possible.

RECORDS RETENTION: A copy of this project report and supporting data will be retained for a period of five years. If you want the project file sent to you after the five year period, please return a copy of this letter.

The invoice for this work will be mailed to your Accounts Payable department shortly.

Thank you for using the services of Evergreen Analytical.

Sincerely,


for 
Carl Smits
Technical Director of Chemical Analysis

WORK ORDER Summary

05-Jun 12:37 pm

Client Project ID: COGCC-#1Dutch Well

Report To: Dave Cloutier
 Cordilleran Compliance Services, Inc.
 770 Simms Street Suite 110
 Golden, CO 80401

Phone: (303) 237-2072
FAX: (303) 237-2659

Comments:

QC Level: Laboratory Standard QC

Sample ID	Client Sample ID	Analysis	#	Matrix	Loc	Collection	Received	Due	HT
00-2813-01A	TW-1	BTEX		Water	2	2-Jun-2000	3-Jun-2000	8-Jun-2000	9-Jun-2000
00-2813-02A	TW-2	BTEX						8-Jun-2000	9-Jun-2000
00-2813-03A	TW-3	BTEX						8-Jun-2000	9-Jun-2000
00-2813-04A	TW-4	BTEX						8-Jun-2000	9-Jun-2000
00-2813-05A	TW-5	BTEX						8-Jun-2000	9-Jun-2000
00-2813-06A	TW-6	BTEX						8-Jun-2000	9-Jun-2000
00-2813-07A	TW-7	BTEX						8-Jun-2000	9-Jun-2000

= Special list. See sample comments or test information.
 HT = Holding Time expiration date.

Evergreen Analytical, Inc.
4036 Youngfield St., Wheat Ridge, CO 80033
(303) 425-6021

Methods 602/8020 and 5030/8015 Modified Data Report

Client Sample ID : TW-1

Lab Sample ID : 00-2813-01A

Date Collected : 06/02/2000

Date Received : 06/03/2000

Client Project ID : COGCC-#1Dutch Well

Lab Work Order : 00-2813

Sample Matrix : Water

Method: E602/SW8021B		BTEX (SW8021 MODIFIED)		
Date Prepared : 06/08/2000	Lab File ID : TVB10608\016R0101.D	Effective Dilution : 1		
Date Analyzed : 06/08/2000	Method Blank : MB1060800			
Compound Name	CAS Number	Concentration	RL	Units
Benzene	71-43-2	2.9	2	µg/L
Toluene	108-88-3	U	2	µg/L
Ethylbenzene	100-41-4	7	2	µg/L
m,p-Xylene	1330-20-7	23	2	µg/L
o-Xylene	95-47-6	U	2	µg/L
Surrogate Recovery:	1,2,4-Trichlorobenzene	87%	62 - 132	QC Limits

Comments:

Notes: Total Xylenes consist of three isomers, two of which co-elute. The Xylene RL is for a single peak.
Confirmation analysis was not performed.

Qualifiers:

E = Extrapolated value. Value exceeds calibration range.

U = Compound analyzed for, but not detected.

B = Compound also found in the blank.

J = Indicates an estimated value when the compound is detected, but is below the Reporting Limit.

S = Spike Recovery outside accepted recovery limits.

Definitions:

RL = Reporting Limit.

TVH = Total Volatile Hydrocarbons

TEH = Total Extractable Hydrocarbons

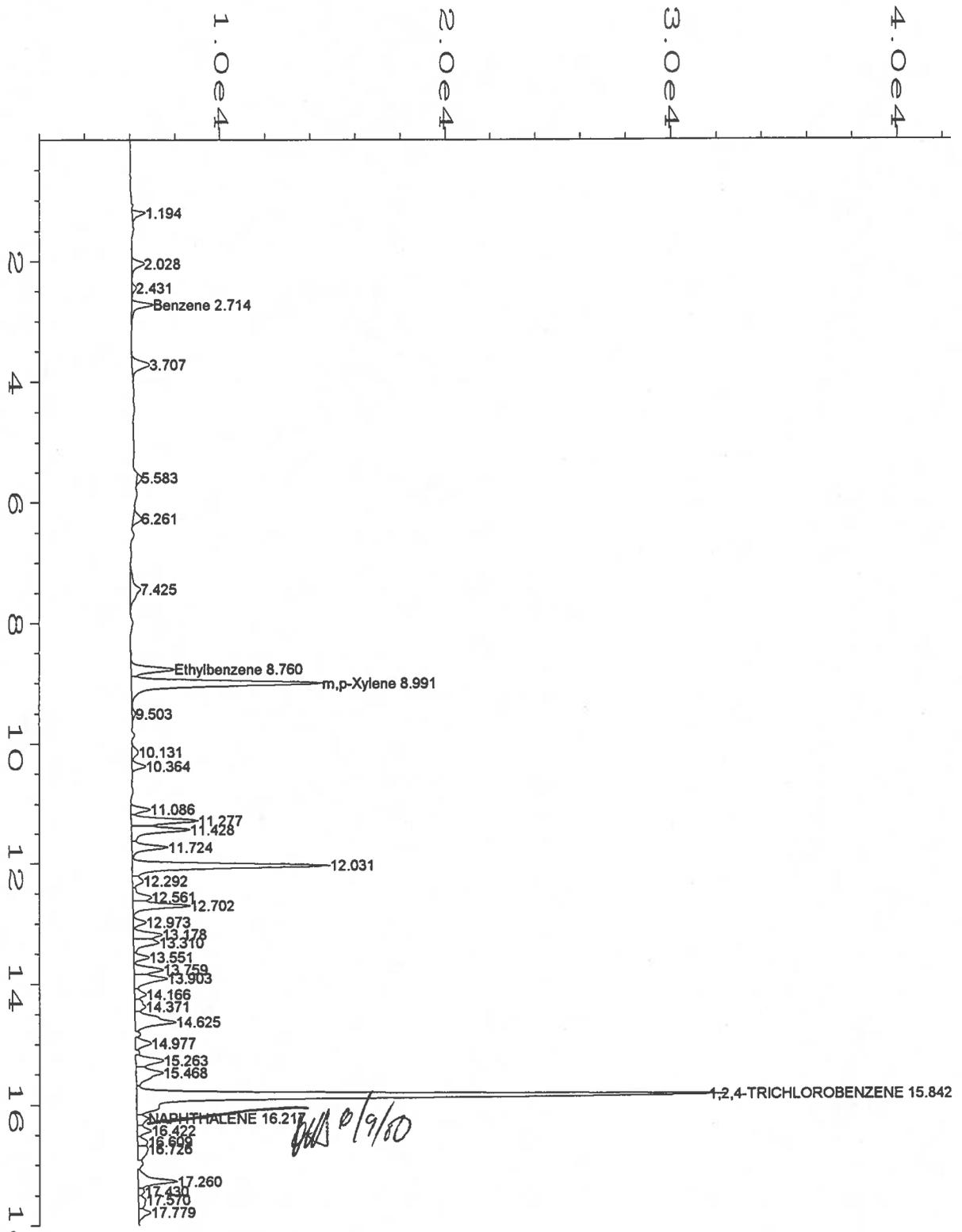


Analyst



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6/09/2000 1:00 PM



Data File Name : C:\HPCHEM\1\DATA\TVB10608\016R0101.D
 Operator : T. BUCHNER
 Instrument : TVHBTEX1
 Sample Name : 00-2813-01A
 Run Time Bar Code:
 Acquired on : 08 Jun 00 11:30 PM
 Report Created on: 09 Jun 00 10:24 AM
 Last Recalib on : 07 JUN 00 03:55 PM
 Multiplier : 1
 Sample Info : SAMP TVH_W BTEX_W
 TW-1;5ML SAMP

Page Number : 1
 Vial Number : 16
 Injection Number : 1
 Sequence Line : 1
 Instrument Method: TVH10503.MTH
 Analysis Method : BX10607.MTH
 Sample Amount : 0
 ISTD Amount :

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(303) 425-6021

Methods 602/8020 and 5030/8015 Modified Data Report

Client Sample ID : TW-2

Lab Sample ID : 00-2813-02A

Date Collected : 06/02/2000

Date Received : 06/03/2000

Client Project ID : COGCC-#1Dutch Well

Lab Work Order : 00-2813

Sample Matrix : Water

Method: E602/SW8021B

BTEX (SW8021 MODIFIED)

Date Prepared : 06/06/2000

Lab File ID : TVB20606\033R0101.D

Effective Dilution : 1

Date Analyzed : 06/07/2000

Method Blank : MB2060600

Compound Name	CAS Number	Concentration	RL	Units
Benzene	71-43-2	U	2	µg/L
Toluene	108-88-3	U	2	µg/L
Ethylbenzene	100-41-4	U	2	µg/L
m,p-Xylene	1330-20-7	U	2	µg/L
o-Xylene	95-47-6	U	2	µg/L
Surrogate Recovery:	1,2,4-Trichlorobenzene	102%	62 - 132	QC Limits

Comments:

Notes: Total Xylenes consist of three isomers, two of which co-elute. The Xylene RL is for a single peak.
Confirmation analysis was not performed.

Qualifiers:

E = Extrapolated value. Value exceeds calibration range.

U = Compound analyzed for, but not detected.

B = Compound also found in the blank.

J = Indicates an estimated value when the compound is detected, but is below the Reporting Limit.

S = Spike Recovery outside accepted recovery limits.

Definitions:

RL = Reporting Limit.

TVH = Total Volatile Hydrocarbons

TEH = Total Extractable Hydrocarbons

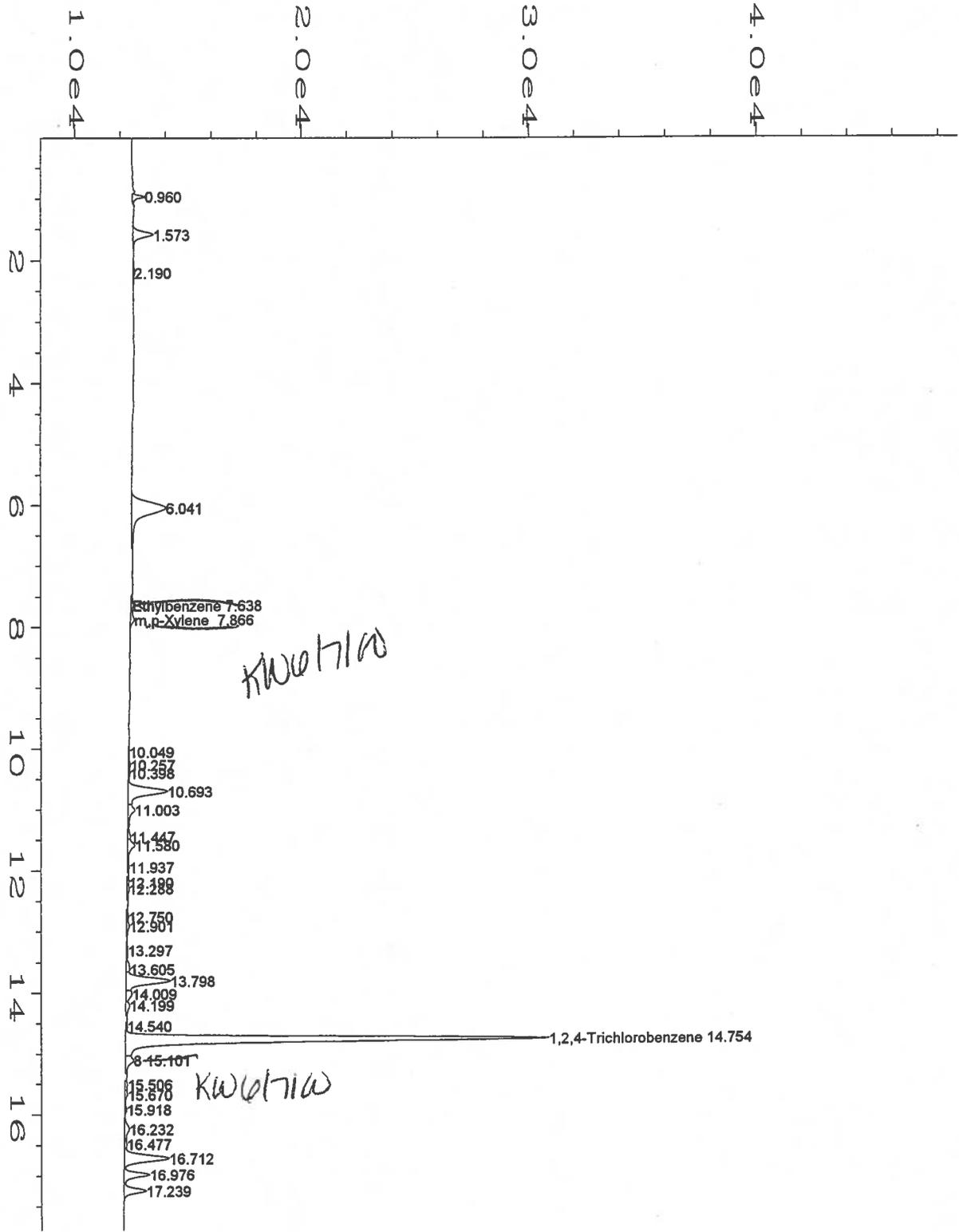
KW

Analyst

MS

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6/08/2000 3:02 PM



Data File Name	: C:\HPCHEM\2\DATA\TVB20606\033R0101.D	Page Number	: 1
Operator	: K.Wardzala	Vial Number	: 33
Instrument	: TVHBTEX2	Injection Number	: 1
Sample Name	: 00-2813-02A	Sequence Line	: 1
Run Time Bar Code:		Instrument Method:	TVW20222.MTH
Acquired on	: 07 Jun 00 04:27 AM	Analysis Method	: BW20606.MTH
Report Created on:	07 Jun 00 04:45 AM	Sample Amount	: 0
Last Recalib on	: 06 JUN 00 02:23 PM	ISTD Amount	:
Multiplier	: 1		
Sample Info	: SAMP TVH_W BTEX_W		
	TW-2		

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Methods 602/8020 and 5030/8015 Modified Data Report

Client Sample ID : TW-3

Lab Sample ID : 00-2813-03A

Date Collected : 06/02/2000

Date Received : 06/03/2000

Client Project ID : COGCC-#1Dutch Well

Lab Work Order : 00-2813

Sample Matrix : Water

Method: E602/SW8021B

BTEX (SW8021 MODIFIED)

Date Prepared : 06/06/2000

Lab File ID : TVB20606\036R0101.D

Effective Dilution : 1

Date Analyzed : 06/07/2000

Method Blank : MB2060600

Compound Name	CAS Number	Concentration	RL	Units
Benzene	71-43-2	U	2	µg/L
Toluene	108-88-3	U	2	µg/L
Ethylbenzene	100-41-4	U	2	µg/L
m,p-Xylene	1330-20-7	U	2	µg/L
o-Xylene	95-47-6	U	2	µg/L
Surrogate Recovery:	1,2,4-Trichlorobenzene	100%	62 - 132	QC Limits

Comments:

Notes: Total Xylenes consist of three isomers, two of which co-elute. The Xylene RL is for a single peak.
Confirmation analysis was not performed.

Qualifiers:

E = Extrapolated value. Value exceeds calibration range.

U = Compound analyzed for, but not detected.

B = Compound also found in the blank.

J = Indicates an estimated value when the compound is detected, but is below the Reporting Limit.

S = Spike Recovery outside accepted recovery limits.

Definitions:

RL = Reporting Limit

TVH = Total Volatile Hydrocarbons

TEH = Total Extractable Hydrocarbons

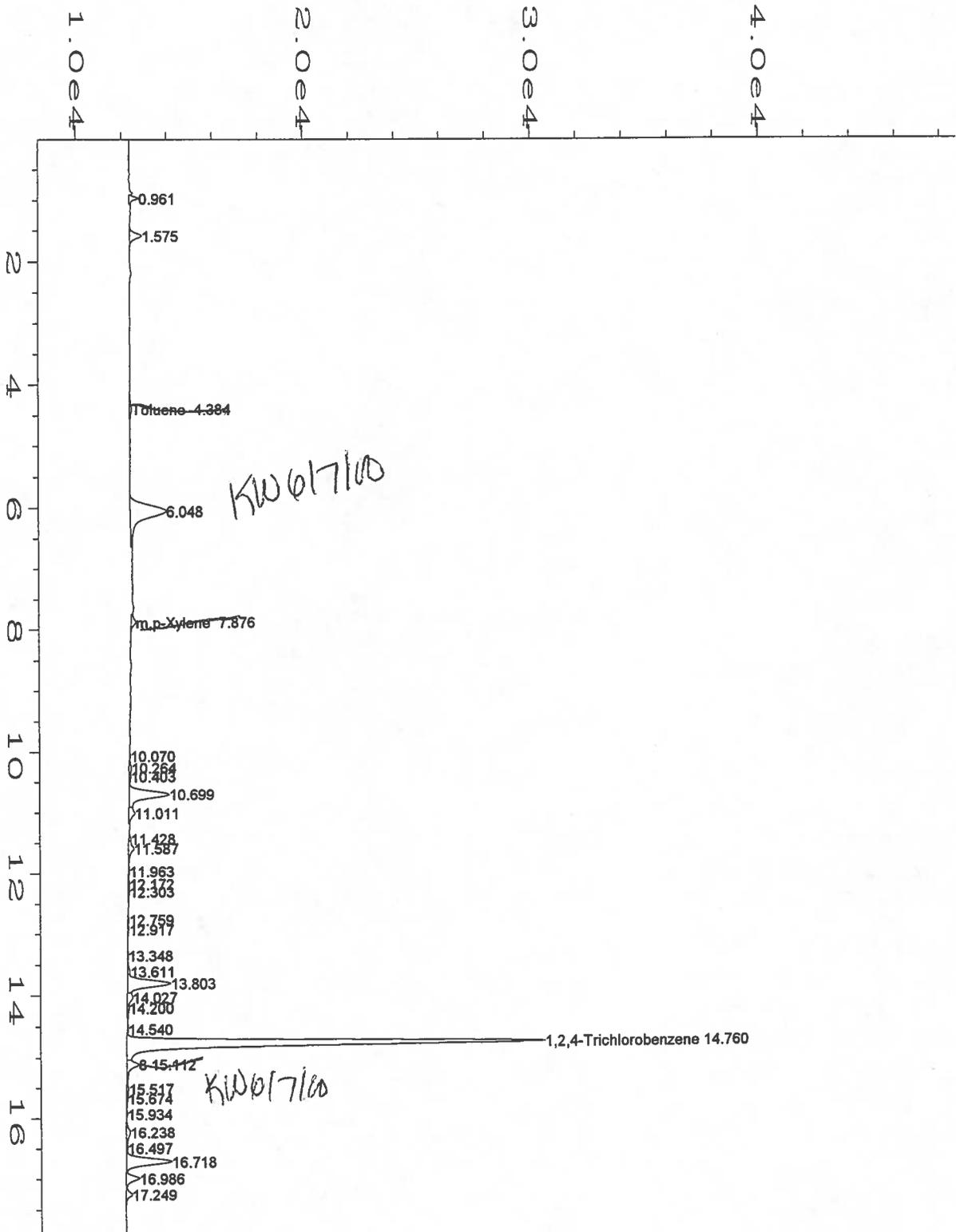


Analyst



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6/08/2000 3:02 PM



Data File Name	: C:\HPCHEM\2\DATA\TVB20606\036R0101.D	Page Number	: 1
Operator	: K.Wardzala	Vial Number	: 36
Instrument	: TVHBTEX2	Injection Number	: 1
Sample Name	: 00-2813-03A	Sequence Line	: 1
Run Time Bar Code:		Instrument Method:	TVW20222.MTH
Acquired on	: 07 Jun 00 06:08 AM	Analysis Method	: BW20606.MTH
Report Created on:	07 Jun 00 06:27 AM	Sample Amount	: 0
Last Recalib on	: 06 JUN 00 02:23 PM	ISTD Amount	:
Multiplier	: 1		
Sample Info	: SAMP TVH_W BTEX_W		
	TW-3		
	27 1		

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Methods 602/8020 and 5030/8015 Modified Data Report

Client Sample ID : TW-4

Lab Sample ID : 00-2813-04A

Date Collected : 06/02/2000

Date Received : 06/03/2000

Client Project ID : COGCC-#1Dutch Well

Lab Work Order : 00-2813

Sample Matrix : Water

Method: E602/SW8021B

BTEX (SW8021 MODIFIED)

Date Prepared : 06/06/2000

Lab File ID : TVB10605\042R0101.D

Effective Dilution : 1

Date Analyzed : 06/06/2000

Method Blank : MB1060600

Compound Name	CAS Number	Concentration	RL	Units
Benzene	71-43-2	U	2	µg/L
Toluene	108-88-3	U	2	µg/L
Ethylbenzene	100-41-4	U	2	µg/L
m,p-Xylene	1330-20-7	U	2	µg/L
o-Xylene	95-47-6	U	2	µg/L
Surrogate Recovery:	1,2,4-Trichlorobenzene	94%	62 - 132	QC Limits

Comments:

Notes: Total Xylenes consist of three isomers, two of which co-elute. The Xylene RL is for a single peak.
Confirmation analysis was not performed.

Qualifiers:

E = Extrapolated value. Value exceeds calibration range.

U = Compound analyzed for, but not detected.

B = Compound also found in the blank.

J = Indicates an estimated value when the compound is detected, but is below the Reporting Limit.

S = Spike Recovery outside accepted recovery limits.

Definitions:

RL = Reporting Limit.

TVH = Total Volatile Hydrocarbons

TEH = Total Extractable Hydrocarbons

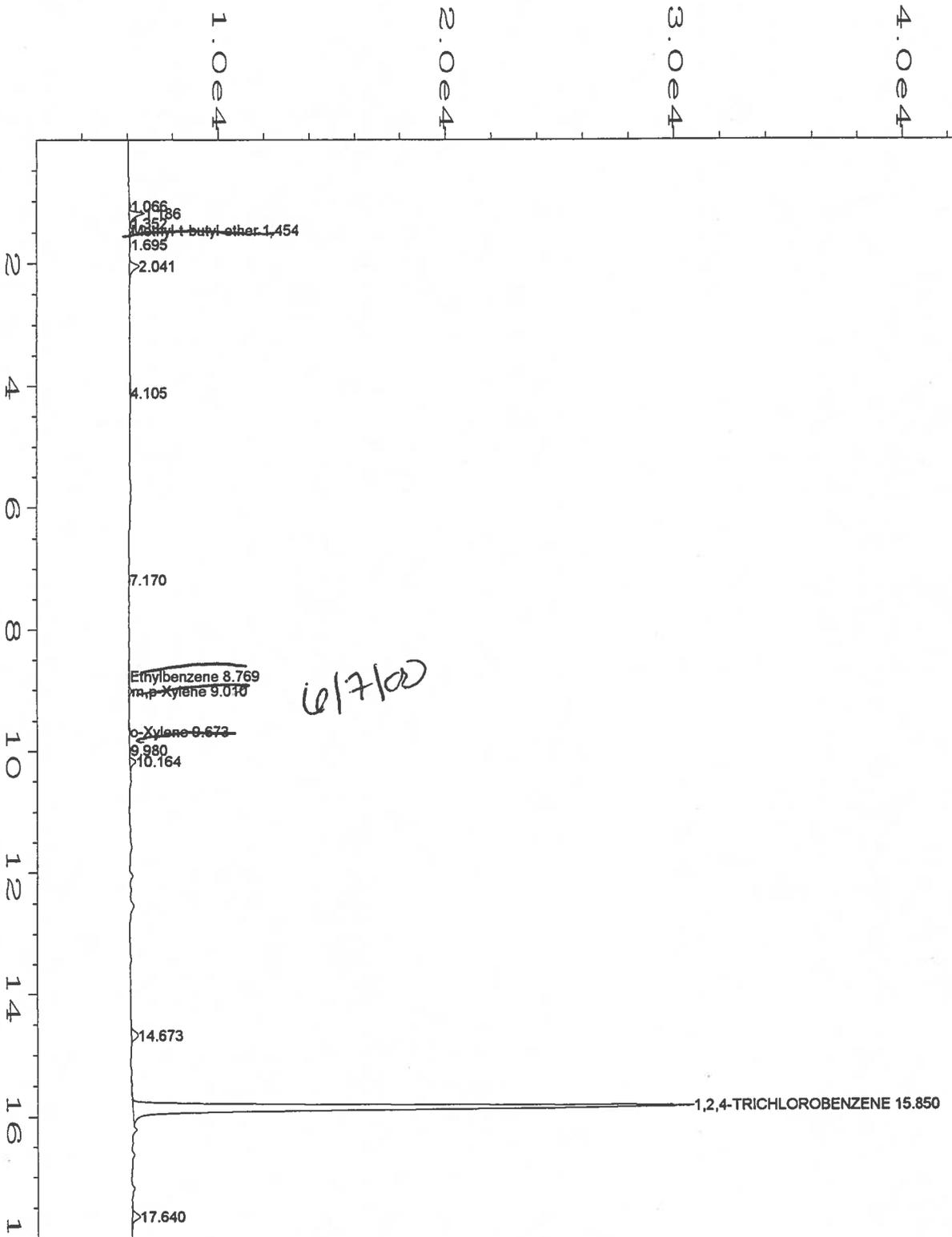
KW

Analyst



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6/08/2000 3:02 PM



Data File Name	: C:\HPCHEM\1\DATA\TVB10605\042R0101.D	Page Number	: 1
Operator	: T. BUCHNER	Vial Number	: 42
Instrument	: TVHBTEX1	Injection Number	: 1
Sample Name	: 00-2813-04A	Sequence Line	: 1
Run Time Bar Code:		Instrument Method:	TVH10503.MTH
Acquired on	: 06 Jun 00 07:55 PM	Analysis Method	: BX10605.MTH
Report Created on:	06 Jun 00 08:13 PM	Sample Amount	: 0
Last Recalib on	: 05 JUN 00 05:28 PM	ISTD Amount	:
Multiplier	: 1		
Sample Info	: SAMP TVH_W BTEX_W		
	: TW-4; 5ML SAMP		

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Methods 602/8020 and 5030/8015 Modified Data Report

Client Sample ID : TW-5

Lab Sample ID : 00-2813-05A

Date Collected : 06/02/2000

Date Received : 06/03/2000

Client Project ID : COGCC-#1Dutch Well

Lab Work Order : 00-2813

Sample Matrix : Water

Method: E602/SW8021B

BTEX (SW8021 MODIFIED)

Date Prepared : 06/06/2000

Lab File ID : TVB20606\037R0101.D

Effective Dilution : 1

Date Analyzed : 06/07/2000

Method Blank : MB2060600

Compound Name	CAS Number	Concentration	RL	Units
Benzene	71-43-2	U	2	µg/L
Toluene	108-88-3	U	2	µg/L
Ethylbenzene	100-41-4	U	2	µg/L
m,p-Xylene	1330-20-7	U	2	µg/L
o-Xylene	95-47-6	U	2	µg/L
Surrogate Recovery:	1,2,4-Trichlorobenzene	100%	62 - 132	QC Limits

Comments:

Notes: Total Xylenes consist of three isomers, two of which co-elute. The Xylene RL is for a single peak.
Confirmation analysis was not performed.

Qualifiers:

E = Extrapolated value. Value exceeds calibration range.

U = Compound analyzed for, but not detected.

B = Compound also found in the blank.

J = Indicates an estimated value when the compound is detected, but is below the Reporting Limit.

S = Spike Recovery outside accepted recovery limits.

Definitions:

RL = Reporting Limit.

TVH = Total Volatile Hydrocarbons

TEH = Total Extractable Hydrocarbons

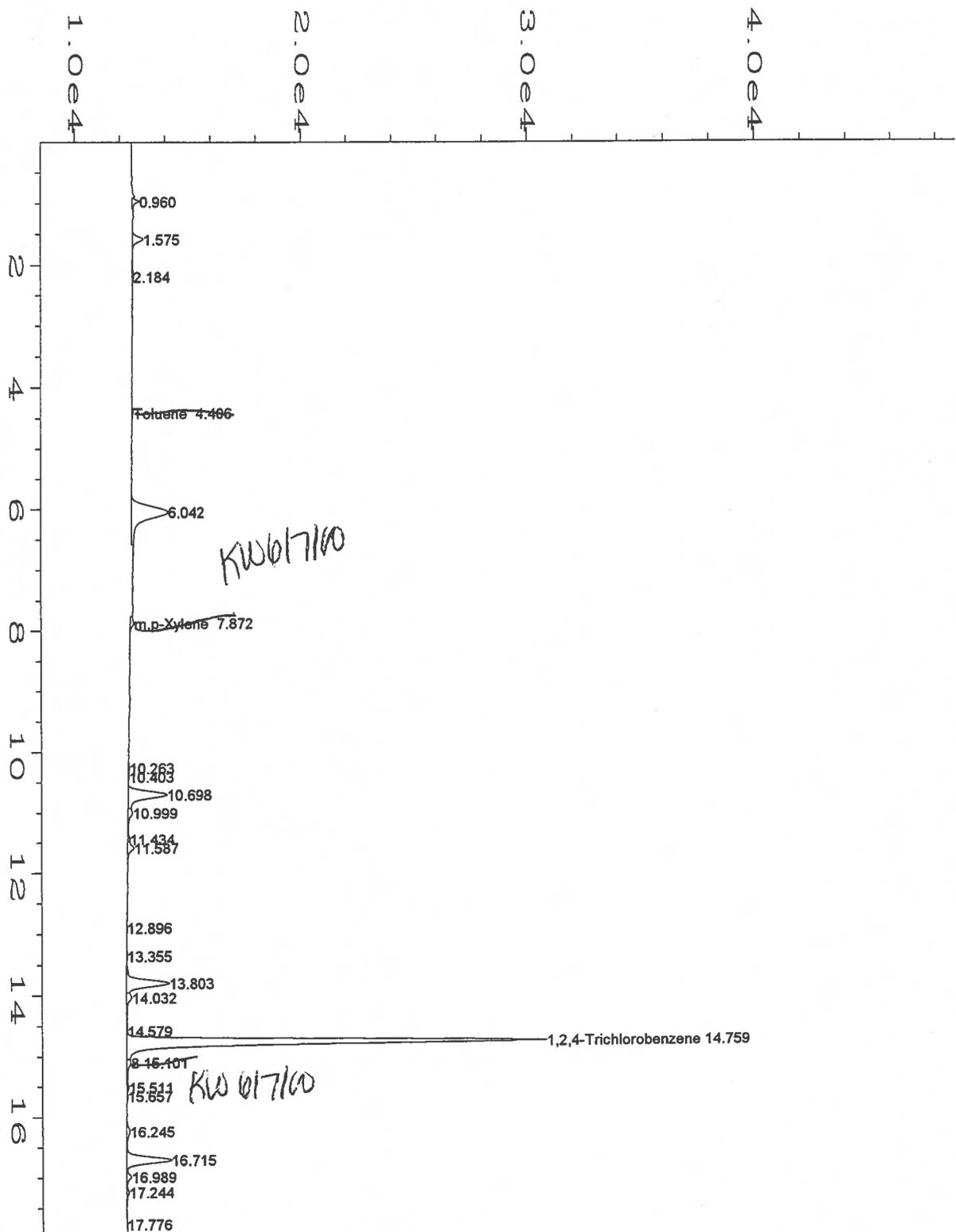


Analyst



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6/08/2000 3:02 PM



Data File Name	: C:\HPCHEM\2\DATA\TVB20606\037R0101.D	Page Number	: 1
Operator	: K.Wardzala	Vial Number	: 37
Instrument	: TVHBTEX2	Injection Number	: 1
Sample Name	: 00-2813-05A	Sequence Line	: 1
Run Time Bar Code:		Instrument Method:	TVW20222.MTH
Acquired on	: 07 Jun 00 06:42 AM	Analysis Method	: BW20606.MTH
Report Created on:	07 Jun 00 07:01 AM	Sample Amount	: 0
Last Recalib on	: 06 JUN 00 02:23 PM	ISTD Amount	:
Multiplier	: 1		
Sample Info	: SAMP TVH_W BTEX_W		
	TW-5		
	DE-1		

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Methods 602/8020 and 5030/8015 Modified Data Report

Client Sample ID : TW-6

Lab Sample ID : 00-2813-06A

Date Collected : 06/02/2000

Date Received : 06/03/2000

Client Project ID : COGCC-#1Dutch Well

Lab Work Order : 00-2813

Sample Matrix : Water

Method: E602/SW8021B

BTEX (SW8021 MODIFIED)

Date Prepared : 06/06/2000

Lab File ID : TVB20606\038R0101.D

Effective Dilution : 1

Date Analyzed : 06/07/2000

Method Blank : MB2060600

Compound Name	CAS Number	Concentration	RL	Units
Benzene	71-43-2	U	2	µg/L
Toluene	108-88-3	U	2	µg/L
Ethylbenzene	100-41-4	U	2	µg/L
m,p-Xylene	1330-20-7	U	2	µg/L
o-Xylene	95-47-6	U	2	µg/L
Surrogate Recovery:	1,2,4-Trichlorobenzene	100%	62 - 132	QC Limits

Comments:

Notes: Total Xylenes consist of three isomers, two of which co-elute. The Xylene RL is for a single peak.
Confirmation analysis was not performed.

Qualifiers:

E = Extrapolated value. Value exceeds calibration range.

U = Compound analyzed for, but not detected.

B = Compound also found in the blank.

J = Indicates an estimated value when the compound is detected, but is below the Reporting Limit.

S = Spike Recovery outside accepted recovery limits.

Definitions:

RL = Reporting Limit

TVH = Total Volatile Hydrocarbons

TEH = Total Extractable Hydrocarbons

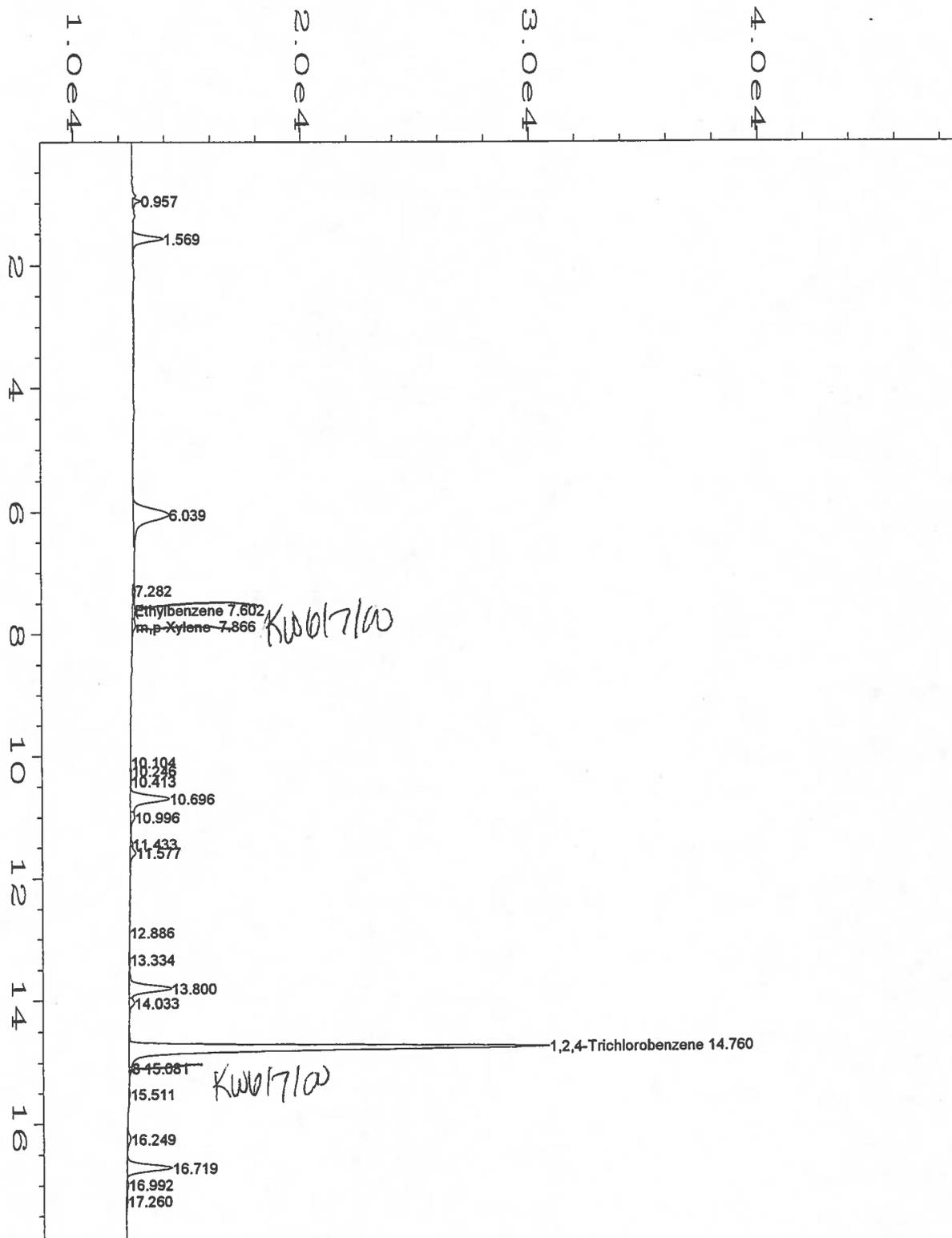


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6/08/2000 3:02 PM



Data File Name	: C:\HPCHEM\2\DATA\TVB20606\038R0101.D	Page Number	: 1
Operator	: K.Wardzala	Vial Number	: 38
Instrument	: TVHBTEX2	Injection Number	: 1
Sample Name	: 00-2813-06A	Sequence Line	: 1
Run Time Bar Code:		Instrument Method:	TVW20222.MTH
Acquired on	: 07 Jun 00 07:16 AM	Analysis Method	: BW20606.MTH
Report Created on:	07 Jun 00 07:35 AM	Sample Amount	: 0
Last Recalib on	: 06 JUN 00 02:23 PM	ISTD Amount	:
Multiplier	: 1		
Sample Info	: SAMP TVH_W BTEX_W		
	TW-6		

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Methods 602/8020 and 5030/8015 Modified Data Report

Client Sample ID : TW-7

Lab Sample ID : 00-2813-07A

Date Collected : 06/02/2000

Date Received : 06/03/2000

Client Project ID : COGCC-#1Dutch Well

Lab Work Order : 00-2813

Sample Matrix : Water

Method: E602/SW8021B

BTEX (SW8021 MODIFIED)

Date Prepared : 06/06/2000

Lab File ID : TVB20606039R0101.D

Effective Dilution : 1

Date Analyzed : 06/07/2000

Method Blank : MB2060600

Compound Name	CAS Number	Concentration	RL	Units
Benzene	71-43-2	U	2	µg/L
Toluene	108-88-3	U	2	µg/L
Ethylbenzene	100-41-4	U	2	µg/L
m,p-Xylene	1330-20-7	U	2	µg/L
o-Xylene	95-47-6	U	2	µg/L
Surrogate Recovery:	1,2,4-Trichlorobenzene	101%	62 - 132	QC Limits

Comments:

Notes: Total Xylenes consist of three isomers, two of which co-elute. The Xylene RL is for a single peak.
Confirmation analysis was not performed.

Qualifiers:

E = Extrapolated value. Value exceeds calibration range.

U = Compound analyzed for, but not detected.

B = Compound also found in the blank.

J = Indicates an estimated value when the compound is detected, but is below the Reporting Limit.

S = Spike Recovery outside accepted recovery limits.

Definitions:

RL = Reporting Limit.

TVH = Total Volatile Hydrocarbons

TEH = Total Extractable Hydrocarbons

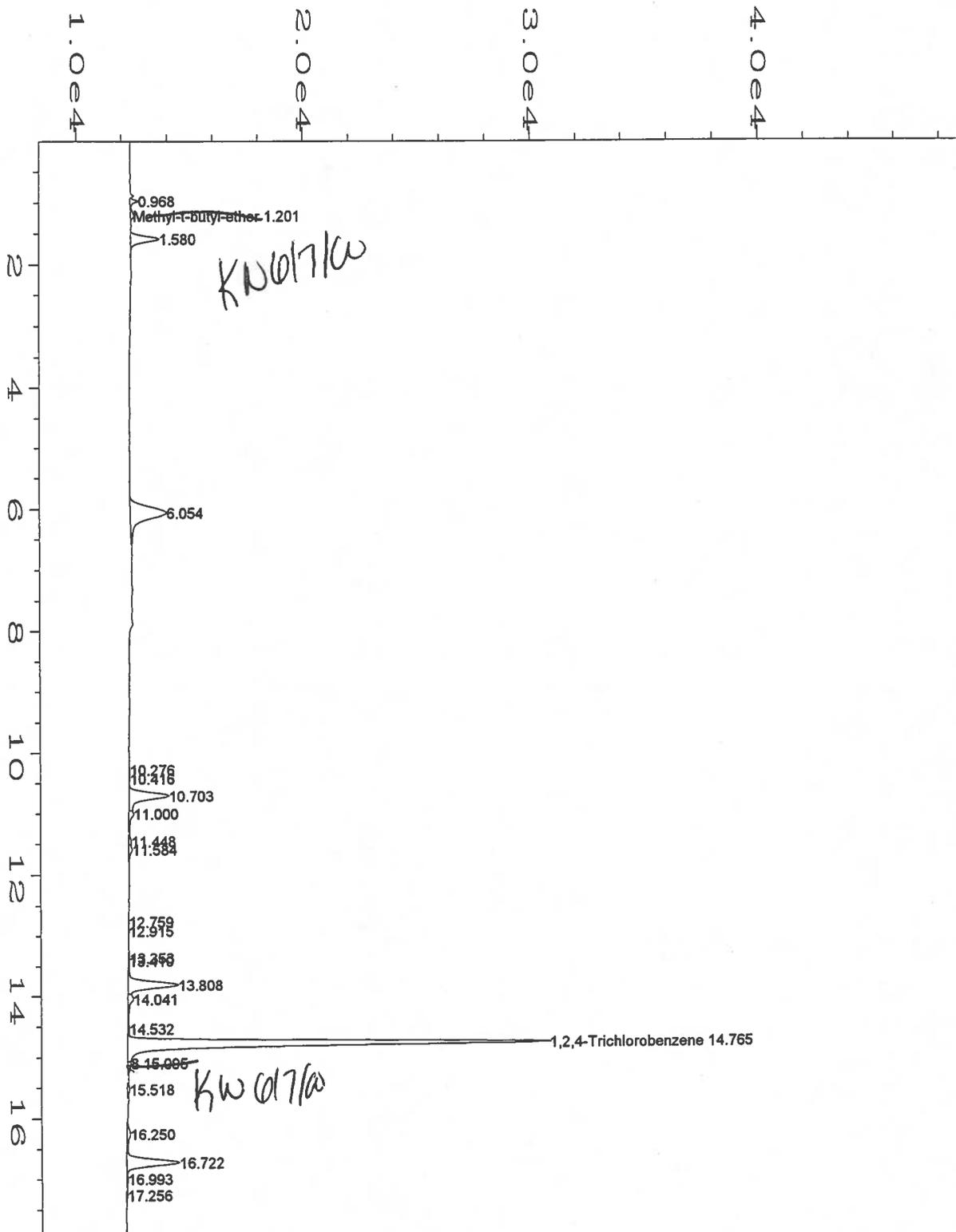


Analyst



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6/08/2000 3:02 PM



Data File Name	: C:\HPCHEM\2\DATA\TVB20606\039R0101.D	Page Number	: 1
Operator	: K.Wardzala	Vial Number	: 39
Instrument	: TVHBTEX2	Injection Number	: 1
Sample Name	: 00-2813-07A	Sequence Line	: 1
Run Time Bar Code:		Instrument Method:	TVW20222.MTH
Acquired on	: 07 Jun 00 07:53 AM	Analysis Method	: BW20606.MTH
Report Created on:	07 Jun 00 08:12 AM	Sample Amount	: 0
Last Recalib on	: 06 JUN 00 02:23 PM	ISTD Amount	:
Multiplier	: 1		
Sample Info	: SAMP TVH_W BTEX_W		
	TW-7		
	--		

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Methods 602/8020 and 5030/8015 Modified Data Report
Method Blank Data Report

Lab Work Order : 00-2813
Lab Sample ID : MB1060600

Client Project ID : COGCC-#1Dutch Well

Method: E602/SW8021B		BTEX + MTBE (SW8021 MODIFIED)		
Date Prepared : 06/06/2000	Lab File ID : TVB10605030R0101.D	Effective Dilution : 1		
Date Analyzed : 06/06/2000				
Compound Name	CAS Number	Concentration	RL	Units
MTBE	1634-04-4	U	8	µg/L
Benzene	71-43-2	U	2	µg/L
Toluene	108-88-3	U	2	µg/L
Ethylbenzene	100-41-4	U	2	µg/L
m,p-Xylene	1330-20-7	U	2	µg/L
o-Xylene	95-47-6	U	2	µg/L
Surrogate Recovery:	1,2,4-Trichlorobenzene	123%	62 - 132	QC Limits

Comments:

Lab Sample ID : MB1060600

Method: SW8015M		TVH (GASOLINE)		
Date Prepared : 06/06/2000	Lab File ID : TVB10605030F0101.D	Effective Dilution : 1		
Date Analyzed : 06/06/2000				
Compound Name	CAS Number	Concentration	RL	Units
TVH-Gasoline	86290-81-5	U	0.5	mg/L
Surrogate Recovery:	1,2,4-Trichlorobenzene	97%	60 - 143	QC Limits

Comments:

Notes: Total Xylenes consist of three isomers, two of which co-elute. The Xylene RL is for a single peak.
Confirmation analysis was not performed.

Qualifiers:

- E = Extrapolated value. Value exceeds calibration range.
- U = Compound analyzed for, but not detected.
- B = Compound also found in the blank.
- J = Indicates an estimated value when the compound is detected, but is below the Reporting Limit.
- S = Spike Recovery outside accepted recovery limits.

Definitions:

- RL = Reporting Limit.
- TVH = Total Volatile Hydrocarbons
- TEH = Total Extractable Hydrocarbons

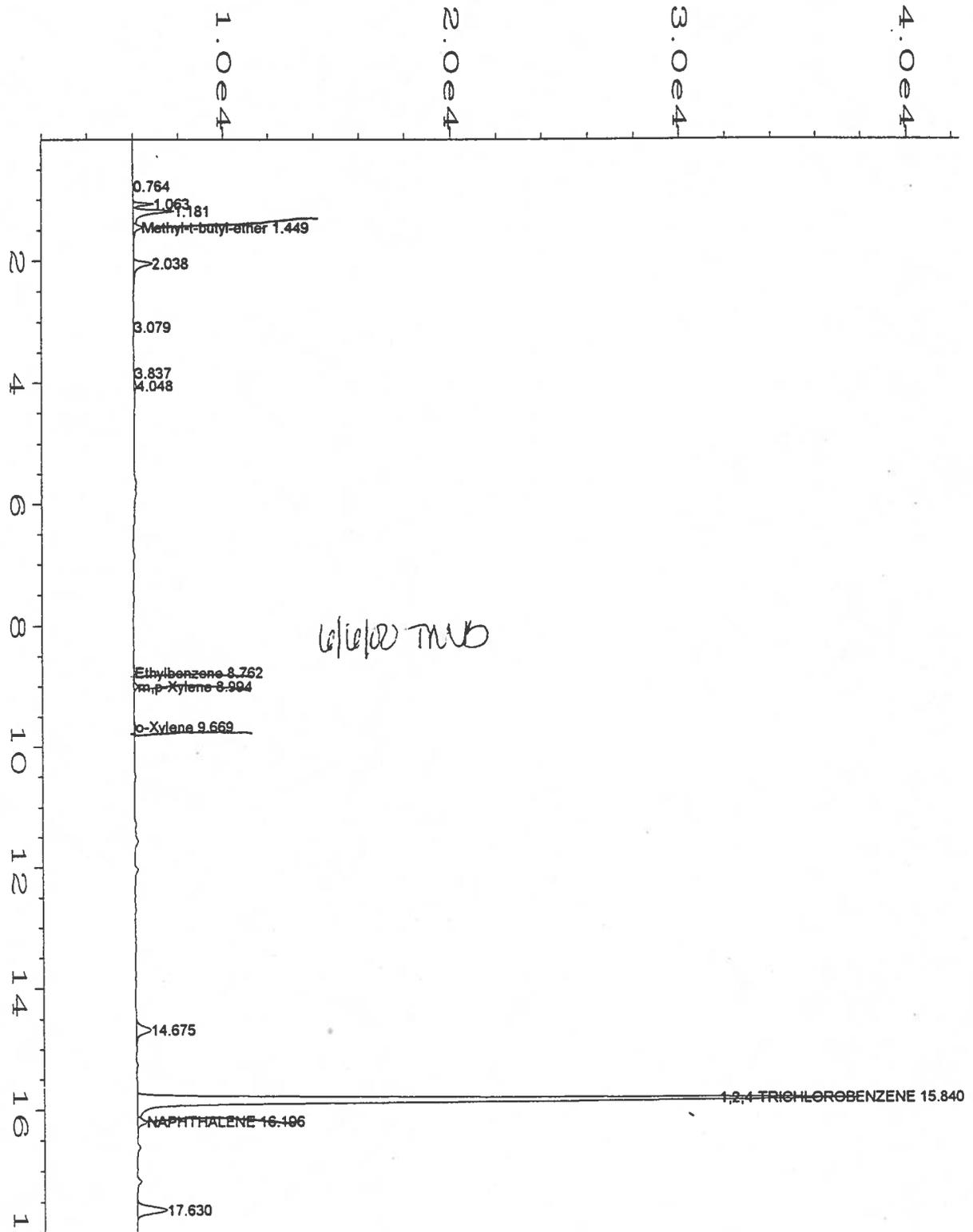


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6/08/2000 3:02 PM



Data File Name	: C:\HPCHEM\1\DATA\TVB10605\030R0101.D	Page Number	: 1
Operator	: T. BUCHNER	Vial Number	: 30
Instrument	: TVHBTEX1	Injection Number	: 1
Sample Name	: MB1060600	Sequence Line	: 1
Run Time Bar Code:		Instrument Method:	TVH10503.MTH
Acquired on	: 06 Jun 00 11:01 AM	Analysis Method	: BX10605.MTH
Report Created on:	06 Jun 00 11:20 AM	Sample Amount	: 0
Last Recalib on	: 05 JUN 00 05:28 PM	ISTD Amount	:
Multiplier	: 1		
Sample Info	: MBLK TVH_W BTEXM_W		

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Methods 602/8020 and 5030/8015 Modified Data Report
Method Blank Data Report

Lab Work Order : 00-2813
Lab Sample ID : MB2060600

Client Project ID : COGCC-#1Dutch Well

Method: E602/SW8021B		BTEX + MTBE (SW8021 MODIFIED)		
Date Prepared : 06/06/2000	Lab File ID : TVB20606015R0101.D	Effective Dilution : 1		
Date Analyzed : 06/06/2000				
Compound Name	CAS Number	Concentration	RL	Units
MTBE	1634-04-4	U	8	µg/L
Benzene	71-43-2	U	2	µg/L
Toluene	108-88-3	U	2	µg/L
Ethylbenzene	100-41-4	U	2	µg/L
m,p-Xylene	1330-20-7	U	2	µg/L
o-Xylene	95-47-6	U	2	µg/L
Surrogate Recovery:	1,2,4-Trichlorobenzene	100%	62 - 132	QC Limits

Comments:

Lab Sample ID : MB2060600

Method: SW8015M		TVH (GASOLINE)		
Date Prepared : 06/06/2000	Lab File ID : TVB20606015F0101.D	Effective Dilution : 1		
Date Analyzed : 06/06/2000				
Compound Name	CAS Number	Concentration	RL	Units
TVH-Gasoline	86290-81-5	U	0.5	mg/L
Surrogate Recovery:	1,2,4-Trichlorobenzene	125%	60 - 143	QC Limits

Comments:

Notes: Total Xylenes consist of three isomers, two of which co-elute. The Xylene RL is for a single peak.
Confirmation analysis was not performed.

Qualifiers:

E = Extrapolated value. Value exceeds calibration range.

U = Compound analyzed for, but not detected.

B = Compound also found in the blank.

J = Indicates an estimated value when the compound is detected, but is below the Reporting Limit.

S = Spike Recovery outside accepted recovery limits.

Definitions:

RL = Reporting Limit.

TVH = Total Volatile Hydrocarbons

TEH = Total Extractable Hydrocarbons

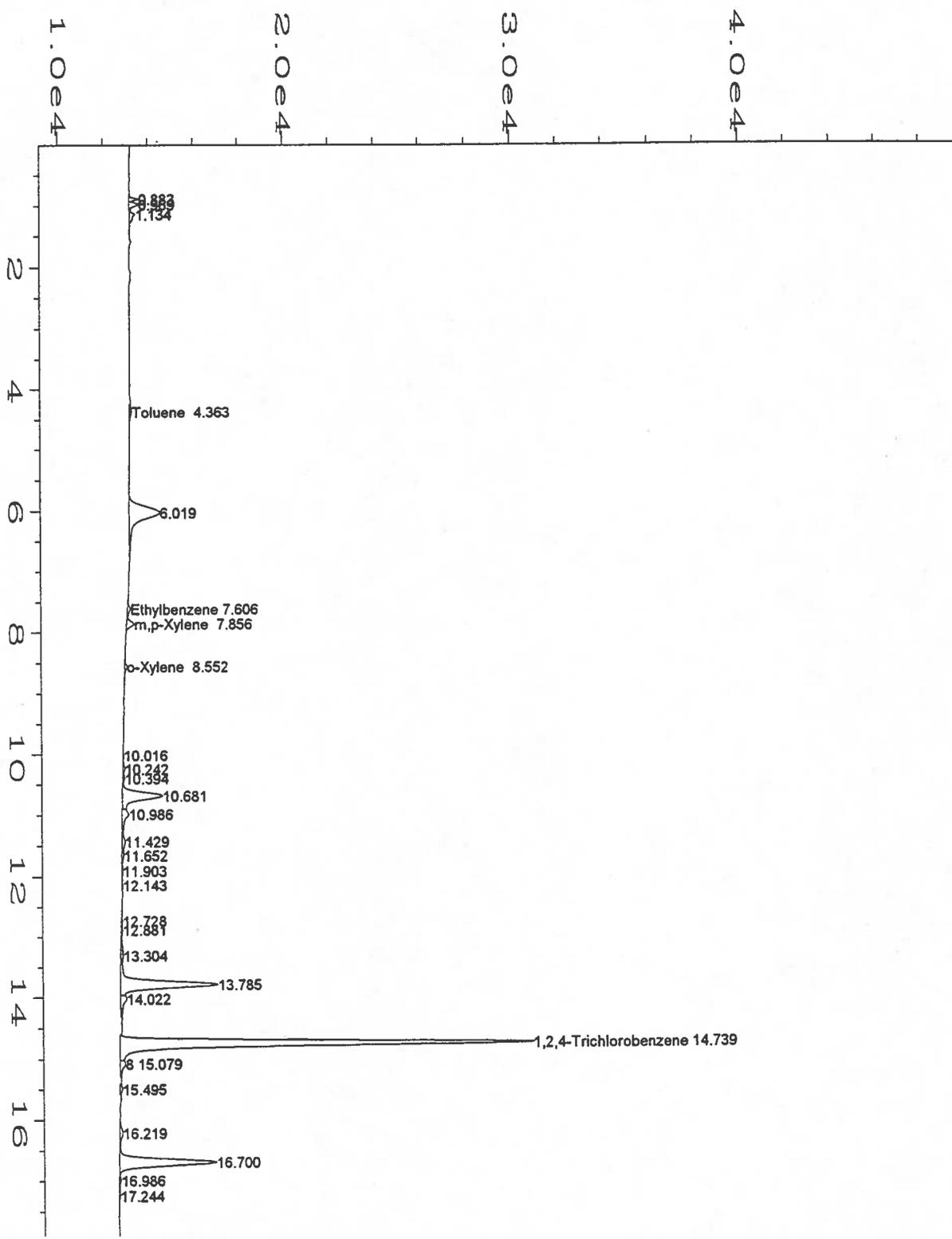


Analyst



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6/08/2000 3:02 PM



Data File Name	: C:\HPCHEM\2\DATA\TVB20606\015R0101.D	Page Number	: 1
Operator	: K.Wardzala	Vial Number	: 15
Instrument	: TVHBTEX2	Injection Number	: 1
Sample Name	: MB2060600	Sequence Line	: 1
Run Time Bar Code:		Instrument Method:	TVW20222.MTH
Acquired on	: 06 Jun 00 06:16 PM	Analysis Method	: BW20606.MTH
Report Created on:	06 Jun 00 06:35 PM	Sample Amount	: 0
Last Recalib on	: 06 JUN 00 02:23 PM	ISTD Amount	:
Multiplier	: 1		
Sample Info	: MBLK TVH_W BTEXM_W		

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Methods 602/8020 and 5030/8015 Modified Data Report
Method Blank Data Report

Lab Work Order : 00-2813
Lab Sample ID : MB1060800

Client Project ID : COGCC-#1Dutch Well

Method: E602/SW8021B		BTEX + MTBE (SW8021 MODIFIED)		
Date Prepared : 06/08/2000	Lab File ID : TVB10608\010R0101.D	Effective Dilution : 1		
Date Analyzed : 06/08/2000				
Compound Name	CAS Number	Concentration	RL	Units
MTBE	1634-04-4	U	8	µg/L
Benzene	71-43-2	U	2	µg/L
Toluene	108-88-3	U	2	µg/L
Ethylbenzene	100-41-4	U	2	µg/L
m,p-Xylene	1330-20-7	U	2	µg/L
o-Xylene	95-47-6	U	2	µg/L
Surrogate Recovery:	1,2,4-Trichlorobenzene	109%	62 - 132	QC Limits

Comments:

Lab Sample ID : MB1060800

Method: SW8015M		TVH (GASOLINE)		
Date Prepared : 06/08/2000	Lab File ID : TVB10608\010F0101.D	Effective Dilution : 1		
Date Analyzed : 06/08/2000				
Compound Name	CAS Number	Concentration	RL	Units
TVH-Gasoline	86290-81-5	U	0.5	mg/L
Surrogate Recovery:	1,2,4-Trichlorobenzene	97%	60 - 143	QC Limits

Comments:

Notes: Total Xylenes consist of three isomers, two of which co-elute. The Xylene RL is for a single peak.
Confirmation analysis was not performed.

Qualifiers:

E = Extrapolated value. Value exceeds calibration range.

U = Compound analyzed for, but not detected.

B = Compound also found in the blank.

J = Indicates an estimated value when the compound is detected, but is below the Reporting Limit.

S = Spike Recovery outside accepted recovery limits.

Definitions:

RL = Reporting Limit.

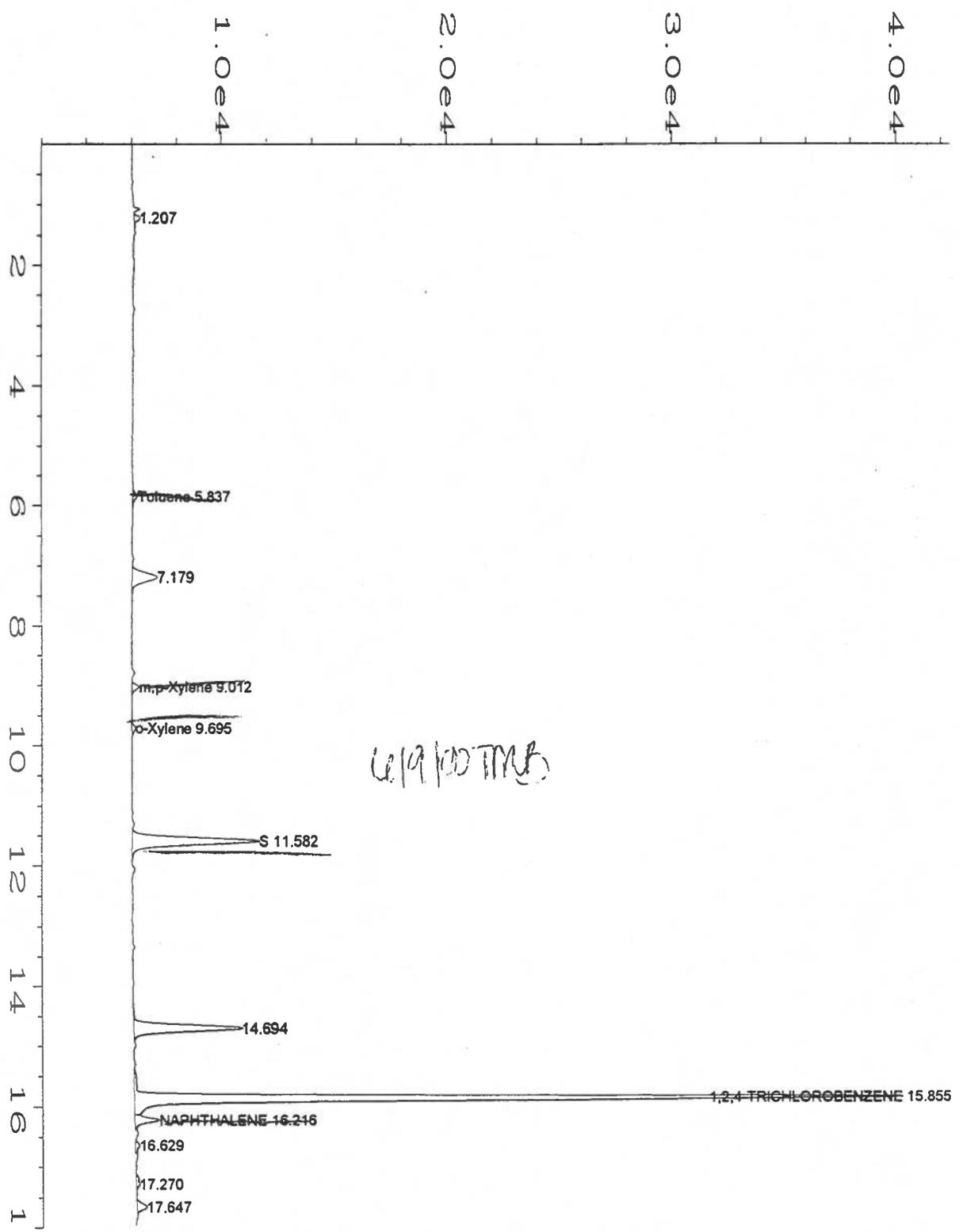
TVH = Total Volatile Hydrocarbons

TEH = Total Extractable Hydrocarbons

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6/09/2000 1:00 PM



Data File Name : C:\HPCHEM\1\DATA\TVB10608\010R0101.D
 Operator : T. BUCHNER
 Instrument : TVHBTEX1
 Sample Name : MB1060800
 Run Time Bar Code:
 Acquired on : 08 Jun 00 08:09 PM
 Report Created on: 09 Jun 00 10:23 AM
 Last Recalib on : 07 JUN 00 03:55 PM
 Multiplier : 1
 Sample Info : MBLK TVH_W BTEXM_W

Page Number : 1
 Vial Number : 10
 Injection Number : 1
 Sequence Line : 1
 Instrument Method: TVH10503.MTH
 Analysis Method : BX10607.MTH
 Sample Amount : 0
 ISTD Amount :