

QUARTERLY GROUNDWATER REPORT

**5800 CHRISTIE AVENUE,
EMERYVILLE, CALIFORNIA**

MAY 10, 1993

**SUBMITTED TO: MR. BRIAN OLIVA
ALAMEDA COUNTY HEALTH CARE SERVICES
HAZARDOUS MATERIALS DIVISION
80 SWAN WAY, ROOM 200
OAKLAND, CALIFORNIA 94621**

**PREPARED FOR : CROLEY & HERRING INVESTMENT COMPANY
448 THARP DRIVE,
MORAGA, CALIFORNIA 94556**

**PREPARED BY: *ETS* ENVIRONMENT & TECHNOLOGY SERVICES
2081 15TH STREET,
SAN FRANCISCO, CALIFORNIA 94114
TELEPHONE: 415-861-0810
FACIMILE: 415-861-3269**

ETS ENVIRONMENT & TECHNOLOGY SERVICES

2081 15TH STREET, SAN FRANCISCO, CALIFORNIA 94114
PHONE 415-861-0810 FAX 415-861-3269

May 10, 1993

Mr. Dick Herring
President
Croley & Herring Investment Company
448 Tharp Avenue,
Moraga, California 94556

Subject: Quarterly Groundwater Report
5800 Christie Avenue, Emeryville, California

Dear Mr. Herring:

Enclosed please find a copy of the quarterly groundwater report for the April, 1993 water sampling period at the subject facility.

Please contact me if you have any question about this report.

Sincerely,



Walter W. Loo, RG CEG
President



TABLE OF CONTENT

1.0 INTRODUCTION

2.0 GROUNDWATER MOVEMENT ANALYSIS

3.0 GROUNDWATER QUALITY

4.0 SUMMARY OF FINDINGS

APPENDIX A GROUNDWATER LABORATORY ANALYSIS REPORT

APPENDIX B MICROBIOLOGY ANALYSIS

LIST OF FIGURES

FIGURE 1 LOCATION MAP

LIST OF TABLES

**TABLE 1 SUMMARY OF GROUNDWATER LEVEL
 SURVEYS**

TABLE 2 GROUNDWATER MOVEMENT ANALYSIS

**TABLE 3 SUMMARY OF QUARTERLY GROUNDWATER
 QUALITY ANALYSES**

1.0 INTRODUCTION

Environmental & Technology Services(ETS) was retained by Croley & Herring Investment Company to perform the 15th quarterly groundwater monitoring for the facility located at 5800 Christie Street in Emeryville, California. The subject facility is currently leased to an electronic merchandise retailer. Prior to leasing, soil contamination was identified at the subject facility. The contaminated soil was removed with the exception of that which was underlying the building because of safety concerns. The removed soil was remediated on-site and properly disposed of with the approval of the regulatory agencies.

A vapor extraction system(VES) was installed immediately adjacent to the northeastern side of the building to mitigate the residual volatile hydrocarbons contained in the soil. The residual volatile organic chemicals(VOCs) were remediated from an average VOCs concentration of about 660 ppm to a satisfactory level at an average of 0.82 ppm in soil. A soil closure plan was submitted(11/15/91) and approval of closure was received on 1/21/92 after submittal of confirmation soil sampling results. The soil vapor extraction system was decommissioned and the Bay Area Air Quality Management District was notified on 12/16/91. The final VES closure report was completed on August 29, 1992.

As part of the site activities, a quarterly groundwater monitoring program has been implemented. Previous quarterly monitoring events were conducted on November 6, 1989, February 20, 1990, May 31, 1990, September 7, 1990, December 4, 1990, April 16, 1991, July 3, 1991, October 12, 1991, January 26, 1992, April 8, 1992, July 15, 1992, October 19, 1992 and January 11, 1993 respectively. This quarterly monitoring event was conducted on March 29, 1993. Water samples were taken from the monitoring wells and sent to a State-certified laboratory for analysis under proper chain-of-custody procedures.

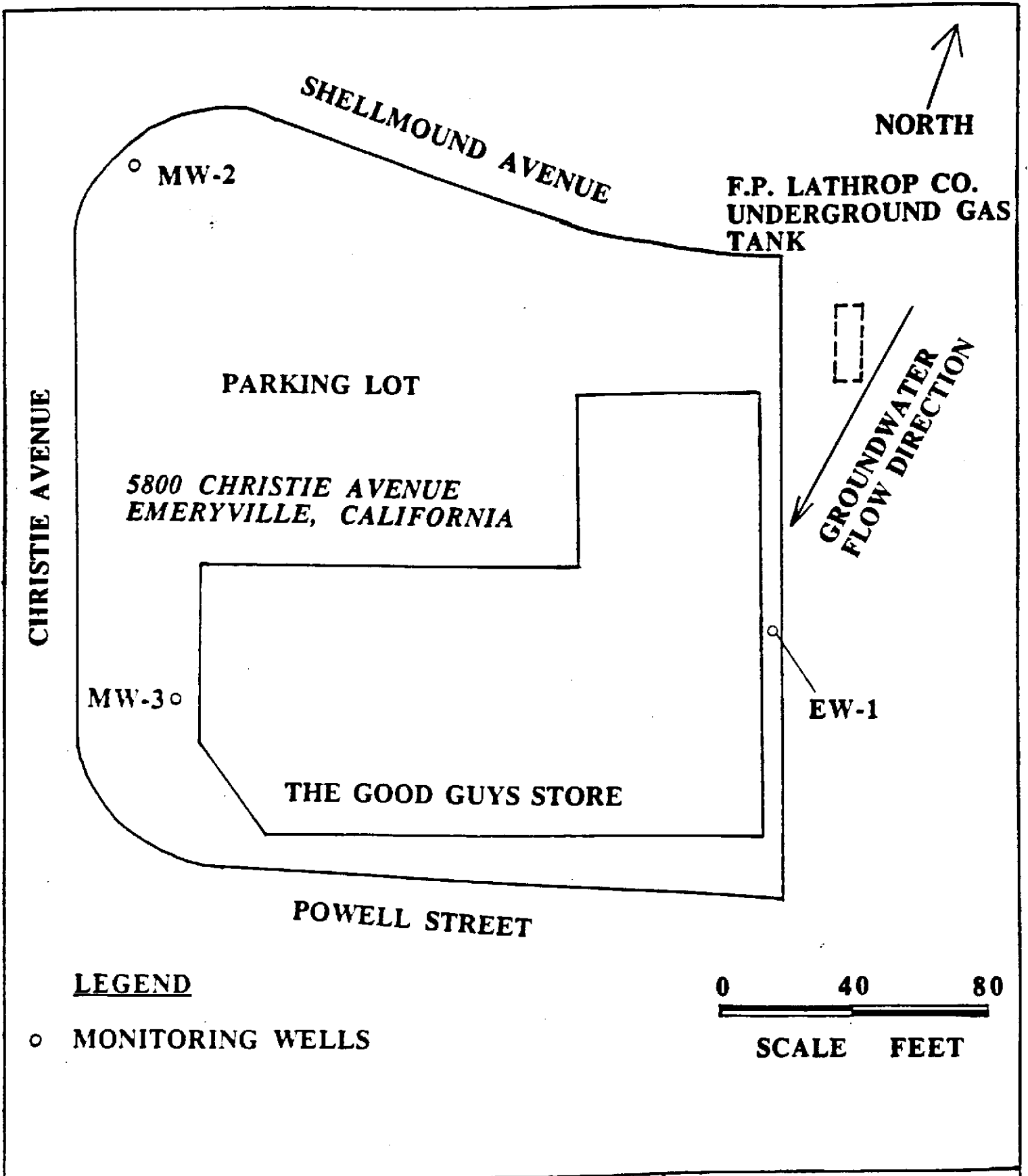
This report presents the results of this quarterly groundwater monitoring event on well EW-1 including laboratory analytical results, groundwater movement analysis, summary of findings, and conclusions and discussions.

2.0 GROUNDWATER MOVEMENT ANALYSIS

Prior to sample collection of this quarterly sampling, depth-to-water table in each of the three existing monitoring wells at the facility was measured for the analysis of groundwater movement. Table 1 presents a summary of the water levels in the three wells (EW-1, MW-2, and MW-3) from the groundwater monitoring events prepared by ETS.

From the result of the water level measurements on April 19, 1993, elevation of water levels were increased in the three wells, as compared to the data collected in April 1992. Nevertheless, the groundwater flow direction remained in the same direction, flowing towards southwest (Figure 1). The hydraulic gradient was 0.013 feet per horizontal foot.

Groundwater movement across the facility remains in a similar pattern, as compared to the result from the previous sampling event. Data of flow direction and hydraulic gradient are summarized in Table 1.



LEGEND

○ MONITORING WELLS

0 40 80
SCALE FEET

ETS
ENVIRONMENT & TECHNOLOGY SERVICES

FIGURE 1
LOCATION MAP

TABLE 1

SUMMARY OF WATER LEVEL DATA

WELL Name	Elev. of TOC (Ft-MSL)	11/6/89		2/20/90		5/31/90		9/7/90	
		DTW Ft.	SWL Ft.	DTW Ft.	SWL Ft.	DTW Ft.	SWL Ft.	DTW Ft.	SWL Ft.
EW-1	8.62	6.15	2.47	5.93	2.69	5.86	2.76	6.30	2.32
MW-2	7.42	4.37	3.05	4.26	3.16	4.26	3.16	4.60	2.82
MW-3	6.42	5.10	1.32	5.42	1.00	4.93	1.49	5.15	1.17

WELL Name	12/4/90		4/16/91		7/3/91		10/14/91		1/9/92	
	DTW Ft.	SWL Ft.	DTW Ft.	SWL Ft.	DTW Ft.	SWL Ft.	DTW Ft.	SWL Ft.	DTW Ft.	SWL Ft.
EW-1	7.39	2.23	6.02	2.60	6.20	2.42	6.5	2.12	6.20	2.42
MW-2	4.67	2.75	4.31	3.11	4.52	2.9	3.92	3.5	4.43	3.10
MW-3	5.96	1.35	5.25	1.17	5.33	1.09	4.63	1.79	6.50	-0.08

WELL Name	7/15/92		10/19/92		1/11/93		4/19/93	
	DTW Ft.	SWL Ft.	DTW Ft.	SWL Ft.	DTW Ft.	SWL Ft.	DTW Ft.	SWL Ft.
EW-1	6.10	2.52	6.1	2.52	5.5	3.12	5.95	2.67
MW-2	4.42	3.00	4.77	2.65	2.9	4.92	4.35	3.07
MW-3	5.23	1.19	5.37	1.05	3.6	2.82	5.1	1.32

Note: TOC top of casing
 DTW depth to water table
 SWL static water level above MSL
 MSL mean sea level

TABLE 2**GROUNDWATER MOVEMENT ANALYSIS**

Date	4/25/89	11/6/89	2/20/90	5/31/90	9/7/90	12/4/90	
Flow Towards	SW	S	S	S	S	S	
Gradient	0.001	0.012	0.016	0.0125	0.0115	0.045	
Date	4/16/91	7/3/91	10/14/91	1/9/92	7/15/92	10/19/92	
Flow Towards	S	S	S	SW	S	S	
Gradient	0.014	0.013	0.011	0.0238	0.013	0.0127	
Date	1/11/93	4/19/93					
Flow Towards	S	SW					
Gradient	0.011	0.013					

3.0 GROUNDWATER QUALITY

On March 29, 1993, ETS field personnel visited the facility and collected water samples from monitoring well EW-1 for laboratory analysis. These groundwater samples were sent to a state-certified laboratory for analyses of halocarbons using EPA method 601, total petroleum hydrocarbons (TPH) as gasoline and gasoline constituents benzene, toluene, ethylbenzene, and total xylenes (BTEX) using EPA method 602.

From the results of the laboratory analysis (Appendix A), water sample taken from well EW-1 contained some volatile organic compounds. The VOCs detected in well EW-1 from the March 29, 1993 sampling episode are presented in Table 3.

TABLE 3

SUMMARY OF QUARTERLY GROUNDWATER QUALITY RESULTS OF WELL EW-1
5800 CHRISTIE AVENUE,
EMERYVILLE, CALIFORNIA

CONCENTRATIONS IN MG/L

COMPOUNDS	5/8/89	11/6/89	2/20/90	5/31/90	9/7/90	12/4/90	4/6/91	7/3/91	10/12/92	1/8/92	4/8/92
TPH as GASOLINE	NA	0.74	12.0	24.0	25.0	7.4	51.0	23.0	39.0	<5.0	12.0
BENZENE	ND	0.18	1.3	0.056	1.1	0.18	3.0	0.65	ND	ND	4.0
TOLUENE	0.19	0.039	3.6	6.1	0.8	3.2	12.0	8.7	1.3	0.58	ND
XYLENES	0.17	0.067	0.047	0.14	0.042	ND	ND	ND	ND	ND	ND
ETHYLBENZENE	ND	0.0008	0.0071	0.017	ND	ND	ND	ND	ND	ND	ND
HALOCARBONS	0.718	1.1861	4.701	6.876	6.661	3.762	10.6	6.49	2.794	4.459	6.8
TCE	0.64	0.74	1.1	0.83	0.49	1.5	1.3	0.13	0.73	1.7	2.8
1,1 DCE	0.078	0.0023	0.014	0.069	0.036	ND	ND	ND	ND	ND	ND
1,2 DCE	ND	0.35	2.5	0.11	2.4	1.5	3.7	2.0	0.62	1.52	ND
1,1,1 TCA	ND	0.026	0.55	1.2	0.51	0.072	2.9	0.2	0.47	0.089	ND
1,1 DCA	ND	0.034	0.46	1.9	1.3	0.46	1.8	2.0	0.63	0.42	1.3
1,2 DCA	ND	0.0048	0.034	0.033	0.053	ND	ND	ND	0.12	0.25	2.7
VINYL CHLORIDE	ND	0.029	ND	2.6	1.7	0.23	0.9	1.99	0.17	0.48	ND
CHLOROETHANE	ND	ND	0.029	0.094	0.15	ND	ND	0.17	0.054	ND	ND
MET. CHLORIDE	ND	ND	0.014	0.04	0.022	ND	ND	ND	ND	ND	ND
TOTAL VOCs	1.078	1.9261	16.701	30.876	31.661	11.162	61.6	29.49	41.794	<9.459	18.8

NA NOT ANALYSED

ND NOT DETECTED OR BELOW DETECTION LIMITS

VOCs VOLATILE ORGANIC COMPOUNDS (TPH PLUS TOX)

TABLE 3(CONTINUE)

SUMMARY OF QUARTERLY GROUNDWATER QUALITY RESULTS OF WELL EW-1
5800 CHRISTIE AVENUE,
EMERYVILLE, CALIFORNIA

CONCENTRATIONS IN MG/L

COMPOUNDS	7/15/92	10/19/92	1/11/93	3/29/93
TPH as GASOLINE	100.0	26.0	20.0	15.0
BENZENE	ND	ND	ND	ND
TOLUENE	4.7	12.5	7.5	12.0
XYLENES	ND	ND	0.075	ND
ETHYLBENZENE	ND	ND	ND	ND
HALOCARBONS	2.461	5.07	0.065	2.5
PCE	ND	ND	0.042	ND
TCE	0.68	0.27	0.023	2.0
1,1 DCE	ND	4.8	ND	0.5
1,2 DCE	0.6	ND	ND	ND
1,1,1 TCA	0.42	ND	ND	ND
1,1 DCA	0.6	ND	ND	ND
1,2 DCA	0.11	ND	ND	ND
VINYL CHLORIDE	0.15	ND	ND	ND
CHLOROETHANE	ND	ND	ND	ND
MET. CHLORIDE	ND	ND	ND	ND
TOTAL VOCs	102.461	31.07	20.065	17.5

NA NOT ANALYSED

ND NOT DETECTED OR BELOW DETECTION LIMITS

VOCs VOLATILE ORGANIC COMPOUNDS (TPH PLUS TOX)

4.0 SUMMARY OF FINDINGS

Table 3 presents a summary of analytical results of well EW-1 in time series. There are several factors that affect the changes in the hydrocarbon concentration. These factors are variations in water table, chemical breakdown due to biodegradation, and unidentified off-site sources.

An experiment was tried to desorb the organic chemicals from the clayey material and oxidize them in places near well EW-1 by the application of direct electrical current flow in the subsurface without pumping the groundwater. The experiment showed successful control of the flow of groundwater in the area and the total volatile organic compounds (VOCs) at one time reached below 4 ppm due to the induced electrochemical reactions between electrodes. The degree of the effectiveness and success cannot be assessed at this time because the readings were interfered with by the spreading of the upgradient gasoline plume.

Also, there are indications that strong biodegradation activities are taking place in the subsurface. Prescribed amounts of glucose was added to the groundwater underlying the area to stimulate cometabolic biodegradation of the chlorinated solvents. The results of groundwater analysis showed reduction of the chlorinated solvents since the addition of the glucose.

As per discussion with the BARWQCB and ACHCS, the addition of glucose and hydrogen peroxide were terminated. The cause in the rise in concentration of VOCs in well EW-1 was most likely due to the rise in the water table which flushed out more VOCs from the clayey Bay Mud. **However, there is still strong microbial activity in the subsurface as indicated in the microbiology report prepared by Microbe Inotech Laboratories (Appendix B).**

APPENDIX A

GROUNDWATER LABORATORY ANALYSIS REPORT

CKY incorporated
Environmental Services

Date: 03/31/93
N9303-41

CHIC
448 Tharp Drive
Moraga, CA 94556

Attn: Mr. Walter Loo

Subject: Laboratory Report
Project:

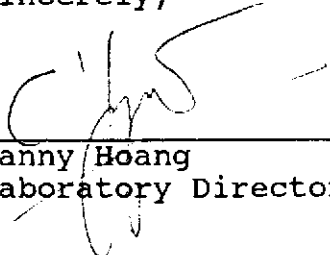
Enclosed is the laboratory report for samples received on 03/29/93. The samples were received in coolers with ice and intact; the chain-of-custody forms were properly filled out. The data reported includes:

<u>Method</u>	<u>No. of Analysis</u>
M8015G	1 Water
EPA 601	1 Water
EPA 602	1 Water

The results are summarized on the following pages.

Please feel free to call if you have any questions concerning these results.

Sincerely,



Danny Hoang
Laboratory Director

EPA METHODS - 601

```

=====
CLIENT:      CHIC                      DATE REC'D:   03/29/93
PROJECT:     PROJECT:                   DATE ANALYZED: 02/30/93
CONTROL NO:  N9303-41                 MATRIX TYPE:  Water
=====

```

<u>PARAMETERS (601)</u>	<u>RESULTS (ug/L)</u>		<u>DET. LIMIT (ug/L)</u>
	<u>N9303-41 Blank</u>	<u>N9303-41-1 EW-1</u>	
Dichlorodifluoromethane	ND	ND	500
Chloromethane	ND	ND	500
Vinyl Chloride	ND	ND	500
Bromomethane	ND	ND	500
Trichlorofluoromethane	ND	ND	100
1,1-Dichloroethene	ND	500	100
Methylene Chloride	ND	ND	100
Trans-1,2-Dichloroethene	ND	ND	100
1,1-Dichloroethane	ND	ND	100
Chloroform	ND	ND	100
1,1,1-Trichloroethane	ND	ND	100
Carbon Tetrachloride	ND	ND	100
1,2-Dichloroethane	ND	ND	100
Trichloroethene	ND	2000	100
1,2-Dichloropropane	ND	ND	100
2-Chloroethylvinylether	ND	ND	100
Trans-1,3-Dichloropropene	ND	ND	100
Cis-1,3-Dichloropropene	ND	ND	100
1,1,2-Trichloroethane	ND	ND	100
Tetrachloroethene	ND	ND	100
Dibromochloromethane	ND	ND	100
Chlorobenzene	ND	ND	100
Bromoform	ND	ND	100
1,1,2,2-Tetrachloroethane	ND	ND	100
M-Dichlorobenzene	ND	ND	100
P-Dichlorobenzene	ND	ND	100
O-Dichlorobenzene	ND	ND	100

EPA METHOD - 602
BTEX

```

=====
CLIENT:      CHIC                      DATE REC'D:   03/29/93
PROJECT:
CONTROL NO:  N9303-41                 DATE EXTRACTED: N/A
MATRIX:      Water                    DATE ANALYZED: 03/30/93
=====

```

<u>COMPOUND</u>	<u>RESULTS (ug/L)</u>		
	<u>N9303-41</u> <u>Blank</u>	<u>N9303-41-1</u> <u>EW-1</u>	<u>DET. LIMIT</u> <u>(ug/L)</u>
Benzene	ND	ND	100
Toulene	ND	12000	100
Ethyl Benzene	ND	ND	100
Xylenes	ND	ND	100
1,3-DCB	ND	ND	100
1,4-DCB	ND	ND	100
1,2-DCB	ND	ND	100
% SURRO RECOVERY	102	80	

EPA METHOD 5030/Mod. 8015
TOTAL PETROLEUM HYDROCARBONS BY PURGE & TRAP

=====

CLIENT:	CHIC	DATE REC'D:	03/29/93
PROJECT:		DATE ANALYZED:	03/30/93
CONTROL NO:	N9303-41	MATRIX:	Water

=====

=====

<u>SAMPLE ID:</u>	<u>CONTROL NO:</u>	<u>RESULTS</u> <u>(mg/L)</u>	<u>DET. LIMIT</u> <u>(mg/L)</u>	<u>% SURRO</u> <u>RECOVERY</u>
Blank	N9303-41	ND	1.0	110
EW-1	N9303-41-1	ND 15 ppb	1.0	83

=====

QUALITY CONTROL DATA

CLIENT: CHIC
 PROJECT: DATE EXTRACTED: N/A
 CONTROL NO: N9303-41 DATE ANALYZED: 03/30/93

METHOD EPA 601
 MATRIX: Water

SAMPLE ID: Blank

<u>COMPOUND</u>	<u>SAMPLE RESULTS</u> (ug/L)	<u>AMOUNT SPIKED</u> (ug/L)	<u>% REC.</u>	<u>DUP. % REC.</u>	<u>RPD</u>
1,1-DCE	ND	50	98	92	6
TCE	ND	50	104	98	6
Chlorobenzene	ND	50	96	92	4

QUALITY CONTROL DATA

CLIENT: CHIC
 PROJECT:
 CONTROL NO: N9303-41

DATE EXTC'D: N/A
 DATE ANALYZED: 03/30/93

METHOD: EPA 8020
 MATRIX: Water

SAMPLE ID: N9303-29-1

<u>COMPOUND</u>	<u>SAMPLE RESULTS</u> (ug/L)	<u>AMOUNT SPIKED</u> (ug/L)	<u>% REC.</u>	<u>DUP. % REC.</u>	<u>RPD</u>
Benzene	ND	20	60	70	15
Toluene	ND	20	60	65	8
Ethyl Benzene	ND	20	60	70	15
Xylene	ND	40	68	75	11

QUALITY CONTROL DATA

CLIENT: CHIC
 PROJECT: DATE EXTRACTED: N/A
 CONTROL NO: N9303-41 DATE ANALYZED: 03/23/93

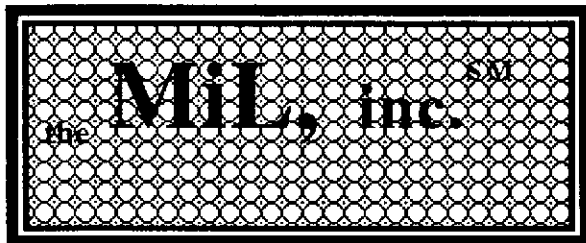
METHOD EPA M8015G
 MATRIX: Water

SAMPLE ID: N9303-29-1

<u>COMPOUND</u>	<u>SAMPLE RESULTS</u> (mg/L)	<u>AMOUNT SPIKED</u> (mg/L)	<u>% REC.</u>	<u>DUP. % REC.</u>	<u>RPD</u>
Gas	ND	2.0	85	90	6

APPENDIX B

MICROBIOLOGY ANALYSIS



**Total
Heterotrophic
Plate Count
Analysis &
Microbial
Identification**

**Microbe
Inotech
Laboratories,
inc.**

1840 Craig Road
St. Louis, MO
63146-4712
U.S.A.

Telephone: (314) 878-6626

(800) 688-9144

FAX: (314) 878-9376

E-mail: Bruce C. Hemming

76177.204@compuserve.com

Report Prepared For:

**Environmental & Technical
Services**

**ATTN: Walter Loo, R.G.,
C.E.G.**

**2081 15th Street
San Francisco, CA 94114**

Client Phone (415) 861-0810

Client Fax (415) 861-3269

Report No. MILB—2243

PO Number none

May 6, 1993

Summary Report of Analysis
[No. 2243]

Environmental & Technical Services
 ATTN: Walter Loo, R.G., C.E.G.
 2081 15th Street
 San Francisco, CA 94114

May 6, 1993

Description:

Thu, Apr 22, 1993 - 2:46 PM: Received C.O.D. by Fedex three waste water samples. Project name CHIC. Project site 5800 Christie-Emery. Samples were labeled EW-1, 2, and 3. They were collected on 4/19 at 10:00am

Chain of Custody Record Information

Purchase Order No.—None
 MiL, Inc. REPORT & Invoice No.: MILB-2243

Processing:

[Standard Bacterial Plate Count - serial dilution method and direct spread plate count] Within 20 minutes of reception an aliquot from each sample was checked for weight and then serially diluted. Each dilution was sterilely transferred in a laminar flow biological cabinet and placed on previously prepared and dried trypticase soy broth agar (TSBA) medium in Petri plates. Observations for colony forming units (CFU) were made at 24 and 48 hrs. of incubation at 28°C for each sample. Colony differentiation was noted at 48 hrs.

Summary Final Results—Total Heterotrophic Plate Count:

DATA:	Direct Count: Colony Forming Units (CFU/ g) on TSBA Medium	
CHIC (Walter Loo)	<u>24 Hrs.</u>	<u>48 Hrs.</u>
Sample:		
EW-1	4.10×10^5	2.44×10^5
EW-2	6.90×10^4	1.05×10^5
EW-3	0	1.50×10^3

Distinct morphological Colony Types at 48 Hrs. in Sample

5

GC-FAME & Biolog™ Processing:

Following isolation the strains were individually streaked out onto TSBA. The TSBA plates were processed after 24 hr incubation by [Method 1 - Standard GC-FAME]. The strains were examined against both the newly installed Aerobe (TSBA [rev. 3.70]) and Clinical Aerobe (CLIN [rev. 3.70]) GC-FAME databases. Subsequently the strains were examined against version 3.0 of the Biolog™ database by an automated microplate reader. Biolog Analyses were made at 24 hrs.

Strains 2243-1 through 2243-3 were taken from EW-1, stain 2243-4 was taken from EW-2 and strain 2243-5 was taken from EW-3.

Summary of GC-FAME/Biolog Analyses							
Strain Name	Primary Identification by GC	Sim. Coef.	Dist Coef.	Primary ID by Biolog™	Plate Type	Sim. Coef	Dist. Coef
2243-1	<i>Xanthomonas maltophilia</i>	0.175	6.036	<i>Enterobacter gergoviae</i>	GN	0.208	15.317
2243-2	<i>Enterobacter agglomerans</i>	0.55	3.536	<i>Klebsiella pneumoniae</i>	GN	0.316	3.174
2243-3	<i>Enterobacter cloacae</i>	0.811	2.089	<i>Klebsiella planticola</i>	GN	0.119	15.509
2243-4	No Match- nearest comparison <i>Bacillus licheniformis</i>	—	11.11	<i>Staphylococcus lentus</i>	GP	0.121	18.319
2243-5	No Match- nearest comparison <i>Moraxella phenylpyruvica</i>	—	24.565	<i>Enterobacter aerogenes</i>	GN	0.575	6.256


Similarity and Distance Coefficient

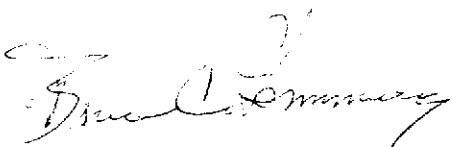
In order to create the database that we use to identify your organisms, thousands of species of bacteria had to be tested. In fact each species itself had to be tested hundreds of times to determine a set of characteristics unique to each species. The species characteristics that are in our database are an "average" of the characteristics of hundreds of tested bacteria of the same species. The Similarity and Distance Coefficient of your organism refers to the similarity and distance to the hypothetical 'mean' organism in the database. The database organism has a similarity coefficient of one and a distance of zero. So the closer your strain is to one and zero the more closely it matches the mean organism in the database.

A good match is one with a similarity coefficient $>.5$ and a distance coefficient of <7 .

Disclaimer: the MiL, inc. is not a human clinical diagnostic laboratory and makes no warranty to the fitness of this data for such purposes.

Thank you from the Staff on project:


Ms. Julie Kidney - Laboratory Manager


Dr. Bruce Hemming Ph.D., Operations Director

CALIB. 1 Standard Calibration Mix [AEROBE] 1-MAY-93 01:55:47 Area: 579192 % Named: 100
 ** GOOD PEAK MATCHING: PEAK POSITION MATCHING ERROR (RMS) IS 0.0017. **

CALIB. 1 Standard Calibration Mix [AEROBE] 1-MAY-93 02:26:08 Area: 570960 % Named: 100
 ** GOOD PEAK MATCHING: PEAK POSITION MATCHING ERROR (RMS) IS 0.0011. **

ID: 1 2243-1 Date of run: 1-MAY-93 02:56:28
 Bottle: 2 SAMPLE [AEROBE]

RT	Area	Ar/Ht	Respon	ECL	Name	X	Comment 1	Comment 2
1.674	162430208	0.029	. . .	7.033	SOLVENT PEAK		< min rt	
1.789	512	0.025	. . .	7.259	. . . . .		< min rt	
1.892	352	0.022	. . .	7.462	. . . . .		< min rt	
3.183	3944	0.027	1.179	9.998	10:0	1.29	ECL deviates -0.002	Reference 0.004
3.608	26496	0.028	1.132	10.606	11:0 ISO	8.32	ECL deviates 0.001	Reference 0.007
3.670	784	0.033	1.125	10.695	11:0 ANTEISO	0.24	ECL deviates 0.002	Reference 0.008
4.273	616	0.035	1.079	11.421	10:0 30H	0.18	ECL deviates -0.002	
4.620	6280	0.033	1.059	11.797	unknown 11.798	1.84	ECL deviates -0.001	
4.778	1072	0.047	. . .	11.968	. . . . .		
4.909	5816	0.034	1.045	12.087	11:0 ISO 30H	1.68	ECL deviates -0.003	
5.478	1000	0.039	. . .	12.580	. . . . .		
6.095	1352	0.039	1.005	13.096	12:0 ISO 30H	0.38	ECL deviates -0.002	
6.584	9296	0.039	0.994	13.453	12:0 30H	2.56	ECL deviates -0.002	
6.810	5896	0.038	0.989	13.618	14:0 ISO	1.62	ECL deviates -0.000	Reference 0.004
7.331	12328	0.040	0.980	13.998	14:0	3.35	ECL deviates -0.002	Reference 0.002
7.500	16080	0.041	0.977	14.108	13:0 ISO 30H	4.36	ECL deviates -0.002	
7.629	2032	0.042	0.976	14.192	13:0 20H	0.55	ECL deviates 0.001	
7.971	1960	0.044	0.971	14.414	15:1 ISO F	0.53	ECL deviates -0.000	
8.294	126432	0.041	0.967	14.623	15:0 ISO	33.91	ECL deviates 0.002	Reference 0.006
8.431	47176	0.041	0.966	14.712	15:0 ANTEISO	12.63	ECL deviates 0.001	Reference 0.005
8.871	1968	0.044	0.961	14.998	15:0	0.52	ECL deviates -0.002	Reference 0.001
9.915	8600	0.044	0.953	15.627	16:0 ISO	2.27	ECL deviates 0.001	Reference 0.004
10.160	5168	0.042	0.951	15.774	16:1 w9c	1.36	ECL deviates 0.000	
10.231	33608	0.045	0.950	15.917	16:1 w7c	8.86	ECL deviates -0.000	
10.533	21576	0.044	0.948	15.999	16:0	5.67	ECL deviates -0.001	Reference 0.002
11.256	11784	0.047	0.944	16.417	ISO 17:1 w9c	3.07	ECL deviates 0.001	
11.623	8248	0.047	0.943	16.629	17:0 ISO	2.16	ECL deviates 0.000	Reference 0.003
11.784	1104	0.055	0.942	16.722	17:0 ANTEISO	0.29	ECL deviates 0.000	Reference 0.003
12.071	3056	0.052	0.940	16.888	17:0 CYCLO	0.80	ECL deviates 0.000	Reference 0.003
13.614	3808	0.049	0.933	17.770	16:1 w9c	0.99	ECL deviates 0.001	
13.788	2184	0.047	0.932	17.824	Sum In Feature 7	0.56	ECL deviates -0.001	18:1 w9c/w12t/w7c
*****	2184	. . . . .	. . . . .	. . . . .	SUMMED FEATURE 7	0.56	18:1 w7c/w9t/w12t	18:1 w9c/w12t/w7c
*****	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	18:1 w12t/w9t/w7c	

Solvent	Ar	Total Area	Named Area	% Named	Total Amt	Nbr Ref	ECL Deviation	Ref ECL Shift
162430208		369584	367512	99.44	360689	13	0.002	0.004

TSBR [Rev 3.70] Xanthomonas 0.175 (Pseudomonas maltophilia)
 X. maltophilia 0.175 (Pseudomonas maltophilia)
 X. campestris 0.106
 X. c. malvacearum 0.106
 CLIN [Rev 3.70] Xanthomonas 0.213 (Pseudomonas maltophilia)

CALIB. 1 Standard Calibration Mix [AEROBEC] 27-APR-93 00:09:00 Area: 517880 % Named: 100
 ** GOOD PEAK MATCHING: PEAK POSITION MATCHING ERROR (RMS) IS 0.0023. **

CALIB. 1 Standard Calibration Mix [AEROBEC] 27-APR-93 00:39:16 Area: 527480 % Named: 100
 ** GOOD PEAK MATCHING: PEAK POSITION MATCHING ERROR (RMS) IS 0.0011. **

ID: 2 2243-2 L00 Date of run: 27-APR-93 01:09:30
 Bottle: 2 SAMPLE [AEROBEC]

RT	Area	Ar/Ht	Respon	ECL	Name	%	Comment 1	Comment 2
1.601	130666944	0.028	...	7.043	SOLVENT PEAK	...	< min rt	
1.779	1120	0.023	...	7.234	...	...	< min rt	
3.839	480	0.030	1.079	10.917	Sum In Feature 3	0.18	ECL deviates 0.003	12:0 ALDE ?
4.826	7320	0.033	1.832	12.000	12:0	2.67	ECL deviates 0.000	Reference -0.010
6.610	880	0.042	0.991	13.456	12:0 30H	0.31	ECL deviates 0.001	
7.297	1616	0.056	0.981	13.955	unknown 13.961	0.56	ECL deviates -0.006	
7.358	21760	0.040	0.981	14.000	14:0	7.55	ECL deviates -0.000	Reference -0.010
8.135	1224	0.051	0.973	14.504	unknown 14.503	0.42	ECL deviates 0.001	
9.240	3928	0.051	0.966	15.204	14:0 20H	1.34	ECL deviates -0.001	
9.713	19400	0.044	0.963	15.488	Sum In Feature 3	6.64	ECL deviates -0.002	14:0 30H/16:1 ISO I
10.265	86784	0.344	0.961	15.819	16:1 w7c	29.49	ECL deviates 0.002	
10.566	82760	0.044	0.960	16.000	16:0	28.09	ECL deviates -0.000	Reference -0.010
13.648	2608	0.047	0.950	17.770	18:1 w9c	0.88	ECL deviates 0.001	
13.742	64200	0.040	0.950	17.824	Sum In Feature 7	21.56	ECL deviates -0.001	18:1 w9c/w12t/w7c
14.052	936	0.054	0.948	18.000	18:0	0.31	ECL deviates 0.000	Reference -0.009
18.737	4440	0.356	...	20.703	...	...	> max rt	
*****	19960	...	...	...	SUMMED FEATURE 3	6.82	12:0 ALDE ?	unknown 10.928
*****	...	...	...	...	...	...	16:1 ISO I/14:0 30H	14:0 30H/16:1 ISO I
*****	64200	...	...	...	SUMMED FEATURE 7	21.56	18:1 w7c/w9t/w12t	18:1 w9c/w12t/w7c
*****	...	...	...	...	...	...	18:1 w12t/w9t/w7c	

Solvent Rr	Total Area	Named Area	% Named	Total Amt	Nbr Ref	ECL Deviation	Ref ECL Shift
130666944	293992	293992	100.00	282738	4	0.002	0.010

ISBA [Rev 3.70]	Enterobacter	0.550
	E. agglomerans	0.550
	E. cancerogenus	0.406 (Erwinia cancerogenus)
	E. sakazakii	0.306
	Proteus	0.524
	P. vulgaris	0.524
	P. v. GC subgroup A	0.524
	Serratia	0.504
	S. marcescens	0.504
	S. n. GC subgroup B	0.504
CLIN [Rev 3.70]	Pseudomonas	0.396
	P. pickettii	0.396
	Serratia	0.326
	S. marcescens	0.326
	Enterobacter	0.241
	E. cloacae	0.241
	E. agglomerans	0.234 (Erwinia herbicola)
	E. a. biogroup III	0.234 (Erwinia herbicola)
	E. a. biogroup I	0.121 (Erwinia herbicola)

ID: 3 2243-3 LAB Date of run: 27-APR-93 03:16:02
 Bottle: 3 SAMPLE [AEROBIC]

RT	Area	Ar/Ht	Respon	ECL	Name	%	Comment 1	Comment 2
1.676	149965560	0.029	. . .	7.040	SOLVENT PEAK		< min rt	
1.775	5832	0.026	. . .	7.234	. . . . .		< min rt	
1.893	656	0.031	. . .	7.465	. . . . .		< min rt	
3.828	1072	0.037	1.091	10.912	Sum In Feature 3 . . .	0.25	ECL deviates -0.002	12:0 ALDE ?
4.814	10184	0.032	1.040	12.000	12:0	2.24	ECL deviates -0.000	Reference -0.004
7.087	736	0.044	. . .	13.814	. . . . .		
7.264	2144	0.052	. . .	13.943	. . . . .		
7.342	34824	0.040	0.904	14.000	14:0	7.24	ECL deviates -0.000	Reference -0.004
8.119	2024	0.046	0.975	14.504	unknown 14.503 . . .	0.42	ECL deviates 0.001	
8.895	1744	0.047	0.969	15.001	15:0	0.36	ECL deviates 0.001	Reference -0.003
9.224	8192	0.050	0.966	15.204	14:0 20H	1.67	ECL deviates -0.001	
9.697	35272	0.044	0.963	15.488	Sum In Feature 3 . . .	7.18	ECL deviates -0.002	14:0 30H/16:1 ISO I
10.248	101088	0.044	0.960	15.819	16:1 w7c	20.50	ECL deviates 0.002	
10.551	151176	0.044	0.958	16.001	16:0	30.60	ECL deviates 0.001	Reference -0.002
12.087	37752	0.047	0.951	16.889	17:0 CYCLO	7.58	ECL deviates 0.001	Reference -0.001
12.277	1592	0.049	0.950	16.999	17:0	0.32	ECL deviates -0.001	Reference -0.003
13.725	106504	0.047	0.943	17.823	Sum In Feature 7 . . .	21.23	ECL deviates 0.001	18:1 w7c/w9t/w12t
14.031	1264	0.047	0.942	17.997	18:0	0.25	ECL deviates -0.003	Reference -0.003
15.805	800	0.057	. . .	18.554	. . . . .		
15.615	872	0.052	0.931	18.902	19:0 CYCLO w8c . . .	0.17	ECL deviates 0.002	Reference 0.002
18.030	2816	0.235	. . .	20.299	. . . . .		> max rt	
*****	36344	. . . . .	. . .	. . .	SUMMED FEATURE 3 . . .	7.42	12:0 ALDE ?	unknown 10.928
*****	. . . . .	. . . . .	. . .	. . .	. . . . .	. . .	16:1 ISO I/14:0 30H	14:0 30H/16:1 ISO I
*****	106504	. . . . .	. . .	. . .	SUMMED FEATURE 7 . . .	21.23	18:1 w7c/w9t/w12t	18:1 w9c/w12t/w7c
*****	. . . . .	. . . . .	. . .	. . .	. . . . .	. . .	18:1 w12t/w9t/w7c	

Solvent Ar	Total Area	Named Area	% Named	Total Amt	Nbr Ref	ECL Deviation	Ref ECL Shift
149965568	497320	493640	99.26	473497	8	0.001	0.003

TSBA [Rev 3.70]	Enterobacter	0.811	(excludes ATCC 35549 which is atypical)
	E. cloacae	0.811	(excludes ATCC 35549 which is atypical)
	E. agglomerans	0.604	
	E. gergoviae	0.578	
	Serratia	0.760	
	S. marcescens	0.760	
	S. m. 6C subgroup B	0.760	
	Citrobacter	0.686	
	C. diversus	0.686	
CLIN [Rev 3.70]	Enterobacter	0.598	
	E. cloacae	0.598	
	E. agglomerans	0.319	(Erwinia herbicola)
	E. a. biogroup III	0.319	(Erwinia herbicola)
	Citrobacter	0.452	
	C. diversus	0.452	
	C. amalonaticus**	0.372	
	Serratia	0.428	
	S. marcescens	0.428	

ID: 2 2243-4 Date of run: 1-MAY-93 03:29:03
 Bottle: 3 SAMPLE [AEROBET]

RT	Area	Ar/Ht	Respon	ECL	Name	%	Comment 1	Comment 2
1.673	165283328	0.029	. . .	7.035	SOLVENT PEAK		< min rt	
1.771	9304	0.025	. . .	7.228	. . . . .		< min rt	
1.890	456	0.023	. . .	7.462	. . . . .		< min rt	
2.578	528	0.028	. . .	8.814	. . . . .		< min rt	
6.807	8490	0.039	0.989	13.618	14:0 ISO	3.76	ECL deviates 0.000	Reference 0.002
7.328	2064	0.048	0.980	13.938	14:0	0.91	ECL deviates -0.002	Reference 0.000
8.070	1128	0.062	0.970	14.479	Sum In Feature 2 . . .	0.49	ECL deviates 0.002	15:1 ISO I/13:0 30H
8.290	73144	0.041	0.967	14.622	15:0 ISO	31.68	ECL deviates 0.001	Reference 0.003
8.429	58240	0.041	0.966	14.712	15:0 ANTEISO	25.19	ECL deviates 0.001	Reference 0.003
8.960	2968	0.043	. . .	15.053	. . . . .		
9.075	1776	0.046	0.959	15.122	14:0 ISO 30H	0.76	ECL deviates 0.005	
9.515	16864	0.043	0.956	15.387	16:1 w7c alcohol . . .	7.22	ECL deviates 0.001	
9.635	1960	0.055	0.955	15.459	16:1 ISO H	0.84	ECL deviates -0.002	
9.911	12864	0.044	0.953	15.625	16:0 ISO	5.49	ECL deviates -0.001	Reference 0.001
10.130	6368	0.045	0.951	15.757	16:1 w1c	2.71	ECL deviates 0.000	
10.530	3520	0.045	0.948	15.998	16:0	1.50	ECL deviates -0.002	Reference 0.000
11.204	6808	0.050	0.945	16.389	ISO 17:1 w10c	2.88	ECL deviates 0.002	
11.363	15320	0.051	0.944	16.481	Sum In Feature 5 . . .	6.48	ECL deviates 0.005	17:1 ISO I/ANTEI B
11.620	7088	0.046	0.943	16.630	17:0 ISO	2.99	ECL deviates 0.001	Reference 0.001
11.780	16872	0.046	0.942	16.722	17:0 ANTEISO	7.12	ECL deviates 0.000	Reference 0.001
12.222	1512	0.054	. . .	16.978	. . . . .		
14.019	4536	0.189	0.931	18.003	18:0	0.00	> max ar/ht	
17.549	1608	0.239	. . .	20.038	. . . . .		> max rt	
18.262	5528	0.245	. . .	20.451	. . . . .		> max rt	
*****	1128	. . . . .	. . .	. . .	SUMMED FEATURE 2 . . .	0.49	15:1 ISO H/13:0 30H	13:0 30H/15:1 i I/H
*****	. . . . .	. . . . .	. . .	. . .	. . . . .	. . .	15:1 ISO I/13:0 30H	
*****	15320	. . . . .	. . .	. . .	SUMMED FEATURE 5 . . .	6.48	17:1 ISO I/ANTEI B	17:1 ANTEISO B/i I

Solvent Ar	Total Area	Named Area	% Named	Total Amt	Nbr Ref	ECL Deviation	Ref ECL Shift
165283328	241512	232496	96.27	223299	8	0.002	0.002

ONE OR MORE NAMED PEAKS REJECTED, SEE COMMENTS IN THE ABOVE REPORT.

ISBA [Rev 3.70] * NO MATCH *
 CLIN [Rev 3.70] * NO MATCH *

GN MicroPlate™

A1 water	A2 α-cyclodextrin	A3 dextrin	A4 glycogen	A5 Tween 40	A6 Tween 80	A7 N-acetyl-D-galactosamine	A8 N-acetyl-D-glucosamine	A9 adonitol	A10 L-arabinose	A11 D-arabitol	A12 cellobiose
B1 erythritol	B2 D-fructose	B3 L-fructose	B4 D-galactose	B5 gentiobiose	B6 α-D-glucose	B7 D-inositol	B8 α-D-lactose	B9 lactulose	B10 maltose	B11 D-mannitol	B12 D-mannose
C1 melibiose	C2 β-methyl D-glucoside	C3 D-psicose	C4 D-raffinose	C5 L-rhamnose	C6 D-sorbitol	C7 sucrose	C8 D-trehalose	C9 turannose	C10 xyritol	C11 methyl pyruvate	C12 mono-methyl succinate
D1 acetic acid	D2 cis-acetic acid	D3 citric acid	D4 formic acid	D5 D-galactonic acid lactone	D6 D-galacturonic acid	D7 D-gluconic acid	D8 D-glucosaminic acid	D9 D-glucuronic acid	D10 α-hydroxybutyric acid	D11 β-hydroxybutyric acid	D12 γ-hydroxybutyric acid
E1 α-hydroxy phenylacetic acid	E2 itaconic acid	E3 α-keto butyric acid	E4 α-keto glutaric acid	E5 α-keto valeric acid	E6 D,L-lactic acid	E7 malonic acid	E8 propionic acid	E9 quinic acid	E10 D-saccharic acid	E11 sebacic acid	E12 succinic acid
F1 succinamic acid	F2 succinamic acid	F3 glucuronamide	F4 alaninamide	F5 D-alanine	F6 L-alanine	F7 L-alanyl-glycine	F8 L-asparagine	F9 L-aspartic acid	F10 L-glutamic acid	F11 glycyl-L-aspartic acid	F12 glycyl-L-glutamic acid
G1 L-histidine	G2 hydroxy L-proline	G3 L-leucine	G4 L-ornithine	G5 L-phenylalanine	G6 L-proline	G7 L-pyrogutamic acid	G8 D-serine	G9 L-serine	G10 L-threonine	G11 D,L-carnitine	G12 γ-amino butyric acid
H1 urocanic acid	H2 inosine	H3 uridine	H4 thymidine	H5 phenyl ethylamine	H6 putrescine	H7 2-amino ethanol	H8 2,3-butanediol	H9 glycerol	H10 D,L-α-glycerol phosphate	H11 glucose-1-phosphate	H12 glucose-6-phosphate

GP MicroPlate™

A1 water	A2 α-cyclodextrin	A3 β-cyclodextrin	A4 dextrin	A5 glycogen	A6 inulin	A7 mannan	A8 Tween 40	A9 Tween 80	A10 N-acetyl-D-glucosamine	A11 N-acetyl-D-mannosamine	A12 amygdalin
B1 L-arabinose	B2 D-arabitol	B3 arbutin	B4 cellobiose	B5 D-fructose	B6 L-fructose	B7 D-galactose	B8 D-galacturonic acid	B9 gentiobiose	B10 D-gluconic acid	B11 α-D-glucose	B12 D-inositol
C1 α-D-lactose	C2 lactulose	C3 maltose	C4 maltotriose	C5 D-mannitol	C6 D-mannose	C7 D-melezitose	C8 D-melibiose	C9 α-methyl D-galactoside	C10 β-methyl D-galactoside	C11 3-methyl glucose	C12 α-methyl D-glucoside
D1 β-methyl D-glucoside	D2 α-methyl D-mannoside	D3 palatinose	D4 D-psicose	D5 D-raffinose	D6 L-rhamnose	D7 D-ribose	D8 salicin	D9 sedoheptulisan	D10 D-sorbitol	D11 stachyose	D12 sucrose
E1 D-tagatose	E2 D-trehalose	E3 turannose	E4 xyritol	E5 D-xylose	E6 acetic acid	E7 α-hydroxybutyric acid	E8 β-hydroxybutyric acid	E9 γ-hydroxybutyric acid	E10 p-hydroxyphenyl acetic acid	E11 α-keto glutaric acid	E12 α-keto valeric acid
F1 lactamide	F2 D-lactic acid methyl ester	F3 L-lactic acid	F4 D-malic acid	F5 L-malic acid	F6 methyl pyruvate	F7 mono-methyl succinate	F8 propionic acid	F9 pyruvic acid	F10 succinamic acid	F11 succinic acid	F12 N-acetyl L-glutamic acid
G1 alaninamide	G2 D-alanine	G3 L-alanine	G4 L-alanyl-glycine	G5 L-asparagine	G6 L-glutamic acid	G7 glycyl-L-glutamic acid	G8 L-pyrogutamic acid	G9 L-serine	G10 putrescine	G11 2,3-butanediol	G12 glycerol
H1 adenosine	H2 2-deoxy adenosine	H3 inosine	H4 thymidine	H5 uridine	H6 adenosine-5-monophosphate	H7 thymidine-5-monophosphate	H8 uridine-5-monophosphate	H9 fructose-6-phosphate	H10 glucose-1-phosphate	H11 glucose-6-phosphate	H12 D-L-α-glycerol phosphate



the MiL, inc.

**Interpretation of the Carbon Source
Pattern Recognition Data using a
Multi-well Plate Method (Biolog
Microplate System™) -- Contact Us:
314-878-6626 or Fax 314-878-9376**

The MiL, inc. utilizes the Biolog Microplate System™ for microbial identification and characterization by carbon source pattern recognition. The microplate technique allows for characterization by 95 different tests yielding a potential of 4×10^{28} patterns generated from a single microplate. Each strain of micro-organism yields a distinct pattern and the different species of bacteria will give distinct families of patterns that can be recognized by the Biolog MicroLog™ Software. Microplates are available for Gram Negative (GN), Gram Positive (GP) and E.coli/Salmonella (ES) Analysis. Custom analysis are performed by the MiL, inc. and can be particularly useful in biodegradation or additional selective media development studies. Additional interpretative instructions are provided with such custom services.

To characterize a given microbial isolate the organism is streaked onto a nutrient medium that will support vigorous growth (for example, Nutrient agar, tryptic soy agar or tryptic soy agar supplemented with 5% sheep red blood cells). The more fastidious organisms may require chocolate or BHI agar for growth, whereas many environmental organisms grow better in more minimal media. The culture plates are incubated at 28 to 35° C for 4-18 hours (environmental isolates are typically grown at 28° C with thermophilic strains often incubated at 50° C). After incubation colonies are removed from the culture plate using a saline moistened cotton swab. A suspension of uniform turbidity is prepared in 0.85% saline by comparison with a

known turbidimetric standard. The bacterial suspension is inoculated into the microplate wells (150 µl per well) and the plate covered with the microplate lid. The covered plates are incubated at 28-35° C for 4 hours or overnight (16-24 hours). Should other diluents be requested or used, such changes will be noted.

Microplates may be read at 4 or 24 hours because some organisms give results at 4 hours and may become unreadable at 24 hours. The plates are read in our microplate reader at 590 nm. The absorbance or transmittance (i.e. color) in each well is referenced against the negative control well (A-1) so that any purple color recorded above this control level is read as a positive utilization of the given carbon source. The data are reported as the percent color change as compared to well A-1 utilizing the following formula.

$$\text{Percent color change} = \frac{\text{OD}_{590}(\text{well}) - \text{OD}_{590}(\text{well A-1})}{\text{OD}_{590}(\text{well A-1})}$$

Positive results will be reported in brackets ([]), generally if the Percent Color Change is equal to or greater than 40, the reaction in the given well is considered to be "positive" however the parameters for each substrate may be different and a positive test below a value of 40 is possible. The reported results will be otherwise considered negative. The computer algorithms employed provide standardization of settings ensuring repeatability and avoidance of operator bias. Names of all carbon source substrates employed are provided in the results regardless of response.

We, the MiL's microbiologists, find these methods to be excellent for strain characterization or differentiation between isolates. However, we urge caution in acceptance of the putative identifications to the commercial database and suggest these tests be conducted in conjunction with other methods (we recommend our GC-FAME analyses) when strain identifications are sought.

Date : 05/05/83
 Hour : 24
 Plate Type : GN
 Plate # : 1
 Strain Name : 2243-1
 Strain # : L00
 Other Info : ?
 Input Mode : Reader : BIOLOG MICROSTATION
 Data Base : MicroLog GN

POSITIVE/NEGATIVE DATA

XXX = percent change in optical density versus A1 control well
 <XXX> = positive, {XXX} = borderline, XXX = negative
 -XXX = percent change negative
 XXX+ = data negative or borderline, "=" ID choice positive > 90% of time
 XXX- = data positive or borderline, "=" ID choice positive < 10% of time

	1	2	3	4	5	6	7	8	9	10	11	12
A :	0	7	< 98 >	< 56 >	< 204 >	< 32 >	< 70 >	< 80 >	< 17 >	13+	3+	-1+
B :	< 14 >	< 69 >	< 32 >	< 23 >	< 55 >	< 39 >	< 19 >	< 35 >	< 29 >	< 42 >	7+	-58+
C :	< 18 >	< 46 >	< 24 >	< 19 >	< 34 >	< 24 >	< 41 >	< 49 >	< 39 >	< 26 >	< 52 >	-34+
D :	< 72 >	< 70 >	< 71 >	< 44 >	< 32 >	< 25 >	< 31 >	< 37 >	< 33 >	< 57 >	< 45 >	-55+
E :	0	< 33 >	< 43 >	< 54 >	< 25 >	< 99 >	< 53 >	< 87 >	< 30 >	< 30 >	-20	< 30 >
F :	< 91 >	< 69 >	< 22 >	< 50 >	< 53 >	< 50 >	< 44 >	< 41 >	< 37 >	< 40 >	-10+	-18+
G :	11+	< 25 >	< 43 >	< 38 >	< 32 >	< 52 >	< 28 >	< 28 >	< 46 >	< 39 >	-19	-12
H :	-4	< 45 >	< 28 >	< 29 >	< 24 >	< 24 >	< 26 >	< 22 >	< 35 >	< 35 >	3+	16+

BIO-NUMBER : 1770-7774-7776-7775-3775-7774-3774-3774

NO IDENTIFICATION

	CLOSEST SPECIES :	SIM.....	DIST.....	AUG.....	MA
X					
=>	1) ENTEROBACTER GERGOVIAE	0.208	15.317	2.000	6.2
38	2) KLEBSIELLA PNEUMONIAE A	0.001	17.213	1.000	4.9
25	3) ENTEROBACTER SAKAZAKII	0.000	17.699	1.688	6.2
94	4) KLEBSIELLA TERRIGENA	0.000	18.514	1.500	9.8
13	5) SERRATIA MARCESCENS	0.000	19.409	2.156	6.3
31	6) KLEBSIELLA PNEUMONIAE B	0.000	19.441	2.406	5.3
56	7) SALMONELLA SUBSPECIES 1 B	0.000	19.459	2.141	5.2
31	8) ENTEROBACTER TAYLORAE	0.000	19.885	1.813	2.8
81	9) KLUYVERA ASCORBATA	0.000	20.843	0.875	5.8
50	10) SERRATIA FICARIA	0.000	20.981	0.656	6.1
94	other :				
--					

ABBREVIATED NAME : ENT.GER
 FULL NAME : ENTEROBACTER GERGOVIAE
 DATA BASE CATEGORY : CLINICAL

4 HOUR DATA :

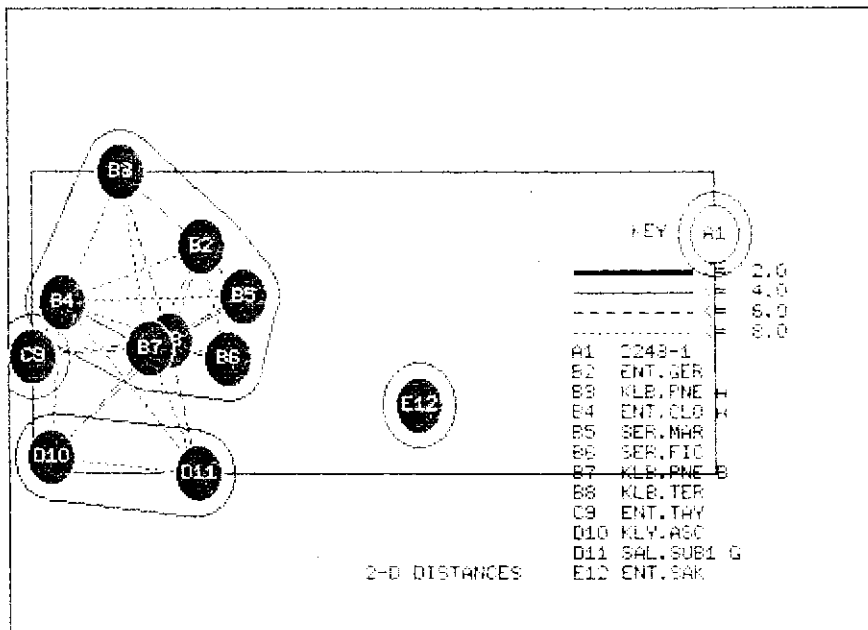
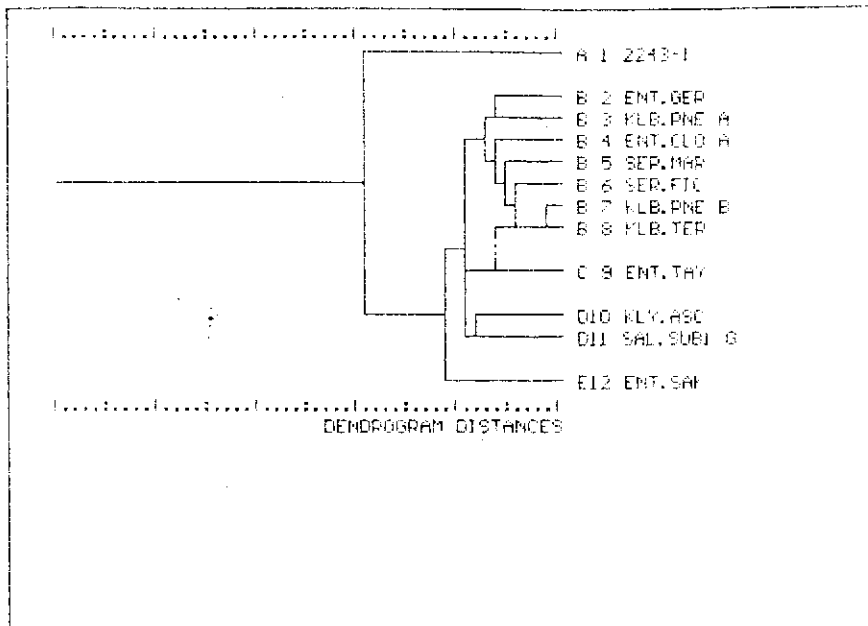
	1	2	3	4	5	6	7	8	9	10	11	12
A :	0	8	100	72	40	16	44	100	0	60	100	0
B :	8	88	24	88	80	100	84	32	8	92	100	80
C :	100	80	88	52	60	100	100	100	48	0	12	88
D :	92	36	60	92	32	56	100	12	44	44	52	28
E :	0	0	8	8	40	100	16	0	8	0	0	100
F :	56	56	12	36	100	100	92	100	80	88	76	92
G :	88	36	8	24	0	100	72	100	92	84	0	44
H :	64	52	52	80	40	68	0	0	100	100	80	84

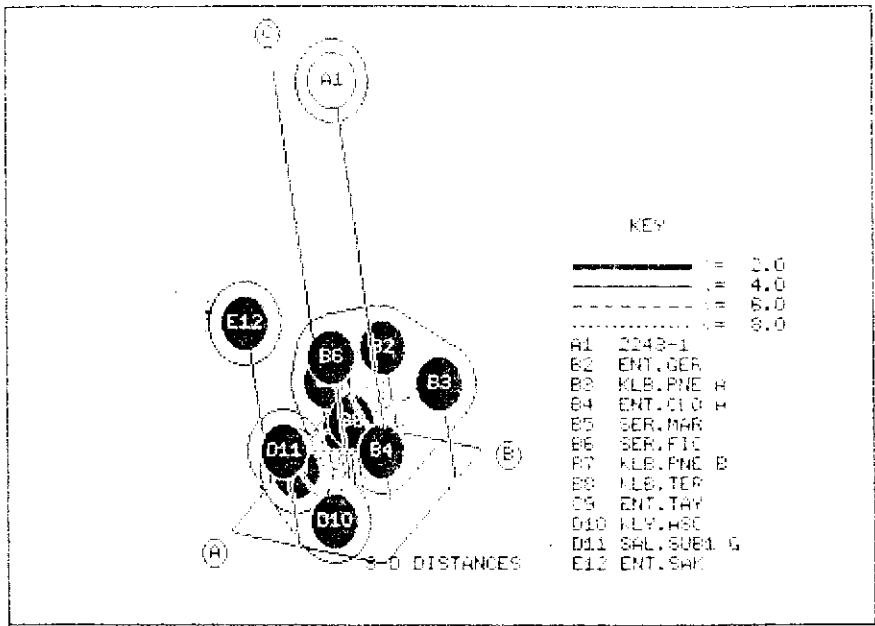
24 HOUR DATA :

	1	2	3	4	5	6	7	8	9	10	11	12
A :	0	32	100	100	88	86	100	100	73	100	100	100
B :	64	100	82	100	100	100	100	100	91	100	100	100
C :	100	100	100	100	100	100	100	100	100	73	100	100
D :	100	100	100	100	73	100	100	51	100	100	100	100
E :	45	41	55	23	50	100	100	45	86	9	0	100
F :	91	73	86	45	100	100	100	100	100	100	100	100
G :	100	59	9	91	64	100	100	100	100	100	0	64
H :	86	55	100	100	45	77	59	36	100	100	100	100

CLOSEST SPECIES :

- 1) 4.965 : KLEBSIELLA TERRIGENA
- 2) 6.060 : KLEBSIELLA PNEUMONIAE A
- 3) 6.106 : SERRATIA MARCESCENS
- 4) 6.281 : KLEBSIELLA PNEUMONIAE B
- 5) 7.044 : SERRATIA FICARIA





MICROLOG (TM) 2, RELEASE 3.00

Date : 30/04/93
 Hour : 24
 Plate Type : GN
 Plate # : 4
 Strain Name : 2243-2
 Strain # : L00
 Other Info : 7
 Input Mode : Reader : BIOLOG MICROSTATION
 Data Base : MicroLog GN

POSITIVE/NEGATIVE DATA

XXX = percent change in optical density versus A1 control well
 <XXX> = positive, {XXX} = borderline, XXX = negative
 -XXX = percent change negative
 XXX+ = data negative or borderline, "=" ID choice positive > 90% of time
 XXX- = data positive or borderline, "=" ID choice positive < 10% of time

	1	2	3	4	5	6	7	8	9	10	11	12
A	0	<234>	<287>	<259>	<328>	<275>	<326>	<334>	<223>	<279>	<309>	<324>
B	<260>	<319>	<263>	<308>	<316>	<335>	<330>	<311>	<234>	<289>	<312>	<341>
C	<327>	<326>	<262>	<350>	<299>	<320>	<331>	<352>	<330>	<158>	<336>	<296>
D	<310>	<328>	<310>	<299>	<342>	<365>	<335>	<144>	<345>	<233>	<289>	-8
E	<294>	{ 11-	<215>	-13	<156-	<328>	<280>	<204>	-17	<333>	-16	<299>
F	<184>	<151>	<154>	<282>	<319>	<326>	<336>	<314>	<240>	<318>	<281>	<302>
G	<256>	-17	-18	<275>	<204>	<296>	<142>	<293>	<269>	<249>	-17	-15
H	<307>	<327>	<287>	<305>	-17	<215>	-20	-9	<341>	<287>	<308>	<314>

BIO-NUMBER : 3777-7777-7777-7776-5365-7777-4774-7517

GENUS IDENTIFICATION : KLEBSIELLA

	CLOSEST SPECIES	SIM	DIST	AVG	MA
X =>	1) KLEBSIELLA PNEUMONIAE B	0.316	3.174	2.406	5.3
56	2) KLEBSIELLA TERRIGENA	0.244	3.265	1.500	9.8
13	3) ENTEROBACTER GERGOVIAE	0.217	3.305	2.000	6.2
38	4) ENTEROBACTER CLOACAE B	0.003	4.705	1.208	7.3
00	5) SERRATIA MARCESCENS	0.001	5.105	2.156	6.3
31	6) ENTEROBACTER TAYLORAE	0.000	5.590	1.813	2.8
81	7) ENTEROBACTER CLOACAE A	0.000	5.977	0.172	1.3
06	8) SALMONELLA SUBSPECIES 1 G	0.000	6.047	2.141	5.2
31	9) KLEBSIELLA PNEUMONIAE A	0.000	6.261	1.000	4.9
25	10) SERRATIA FICARIA	0.000	6.832	0.656	6.1
94	other :	-----	-----	-----	---
--					

ABBREVIATED NAME : KLB.PNE B
 FULL NAME : KLEBSIELLA PNEUMONIAE B
 DATA BASE CATEGORY : CLINICAL

4 HOUR DATA :

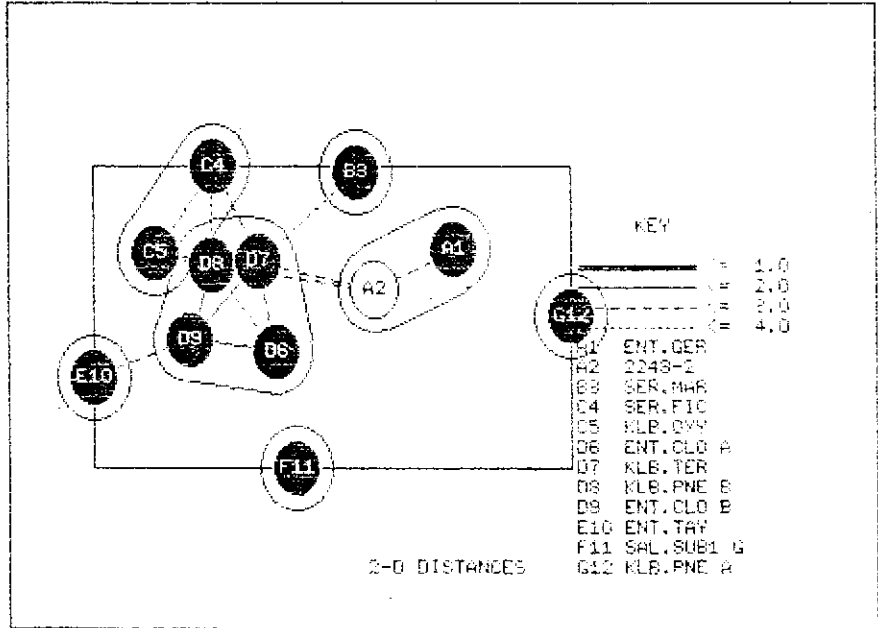
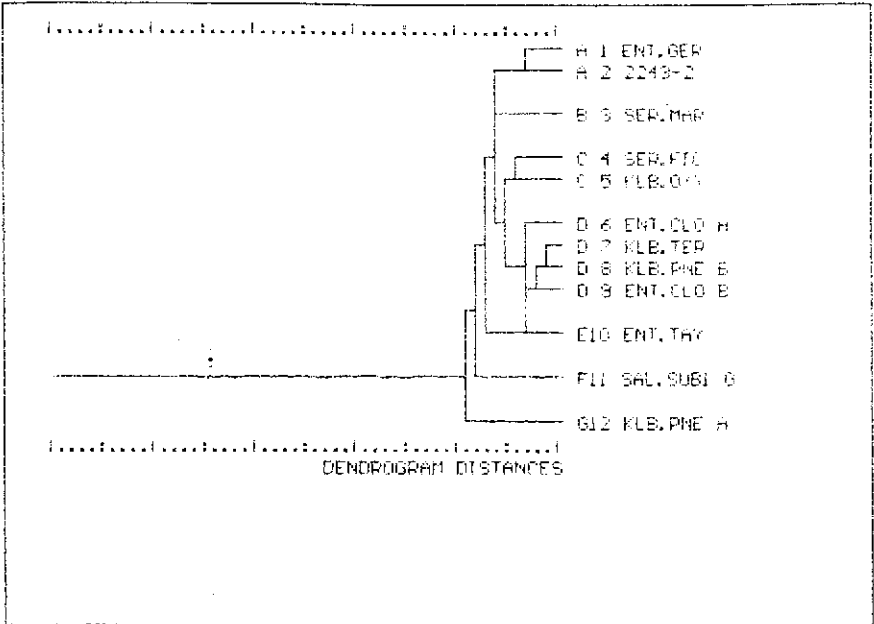
	1	2	3	4	5	6	7	8	9	10	11	12
A	0	0	100	100	64	62	23	100	91	86	100	100
B	0	100	77	100	100	100	86	100	27	100	100	100
C	100	100	100	100	100	100	100	100	9	14	82	91
D	68	91	100	82	100	100	100	0	100	59	36	0
E	77	0	0	14	0	100	73	0	50	91	0	100
F	100	91	100	41	100	100	100	100	86	100	100	100
G	68	9	0	64	59	91	9	100	100	73	0	41
H	86	100	100	100	0	36	0	0	100	62	100	100

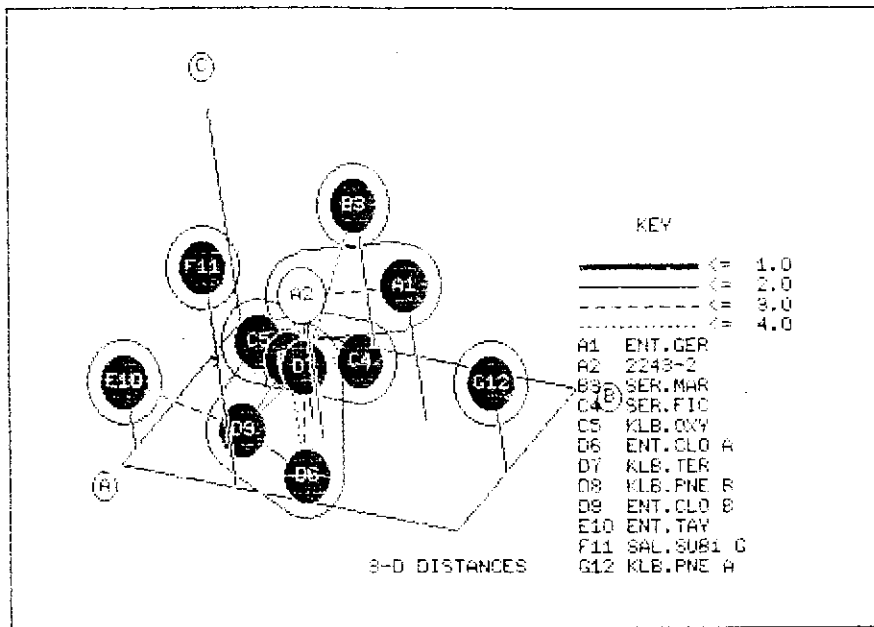
24 HOUR DATA :

	1	2	3	4	5	6	7	8	9	10	11	12
A	0	22	100	91	70	63	78	100	87	100	100	100
B	26	100	100	100	100	100	91	100	91	100	100	100
C	100	100	100	100	100	100	100	100	100	83	100	100
D	48	100	100	100	100	100	100	87	100	48	74	26
E	100	0	17	52	9	100	91	43	78	100	13	100
F	100	76	100	83	100	100	100	100	100	100	100	100
G	100	17	0	74	100	100	22	100	100	100	17	35
H	87	100	100	100	9	48	13	17	100	100	100	100

CLOSEST SPECIES :

- 1) 0.805 : KLEBSIELLA TERRIGENA
- 2) 1.932 : KLEBSIELLA OXYTOCA
- 3) 2.196 : ENTEROBACTER CLOACAE B
- 4) 2.973 : ENTEROBACTER AEROGENES
- 5) 3.488 : KLEBSIELLA PLANTICOLA SS TREVISANII





Date : 30/04/93
 Hour : 24
 Plate Type : GN
 Plate # : 5
 Strain Name : 2243-3
 Strain # : L00
 Other Info : ?
 Input Mode : Reader : BIOLOG MICROSTATION
 Data Base : MicroLog GN

POSITIVE/NEGATIVE DATA

XXX = percent change in optical density versus A1 control well
 <XXX> = positive, {XXX} = borderline, XXX = negative
 -XXX = percent change negative
 XXX+ = data negative or borderline, "=>" ID choice positive > 90% of time
 XXX- = data positive or borderline, "=>" ID choice positive < 10% of time

	1	2	3	4	5	6	7	8	9	10	11	12
A	0	38	53+	34	57	14	< 95>	< 100>	32+	< 68>	20+	< 114>
B	7	26+	12+	< 116>	< 113>	21+	< 102>	33+	28	< 107>	< 91>	< 121>
C	< 114>	< 107>	30+	< 121>	< 71>	< 108>	< 124>	< 122>	50	18	< 80>	51
D	45	< 87>	< 81>	35	< 104>	< 108>	< 93>	30	< 103>	5	< 54>	-2
E	< 77>	-65	-14	-12	-37	< 96>	44	19	-72	< 95>	-73	< 65>
F	0	-20	-26	< 63>	< 86>	< 92>	< 99>	< 85>	41+	< 83>	< 53>	< 60>
G	18+	-73+	-72	52	-1	< 75>	-29	< 83>	< 93>	35	-73	-69
H	< 81>	< 100>	< 78>	44+	-74	17	-75	-68	< 93>	45+	< 79>	< 82>

BIO-NUMBER : 0065-0647-6762-3352-4105-0767-0130-7013
 FALSE POSITIVE WARNING : High optical density in A1 control well. True positives could be under-reported. Check inoculation procedures.
 NO IDENTIFICATION

	CLOSEST SPECIES	SIM	DIST	AVG	MA
X =>	1) KLEBSIELLA PLANTICOLA	0.118	15.509	1.750	5.8
87	2) KLEBSIELLA PLANTICOLA SS TREVISANII	0.045	15.854	3.000	6.6
62	3) ENTEROBACTER AGGLOMERANS B	0.015	16.181	2.438	3.5
75	4) SALMONELLA SUBSPECIES I E	0.001	17.172	2.422	8.4
94	5) KLUYVERA CRYOCRESCENS	0.001	17.251	1.913	4.9
75	6) KLEBSIELLA PNEUMONIAE SS RHINOSCLEROMATI	0.000	17.667	1.625	7.6
25	7) KLEBSIELLA PNEUMONIAE SS OZAENAE	0.000	18.019	2.500	4.1
75	8) BUTTIAUXELLA AGRESTIS	0.000	18.031	1.375	5.5
63	9) YERSINIA ENTEROCOLITICA	0.000	18.326	1.750	5.9
38	10) ENTEROBACTER AEROGENES	0.000	18.339	3.313	6.8
81	other :	-----	-----	-----	---
--					

ABBREVIATED NAME : KLB.PLA
 FULL NAME : KLEBSIELLA PLANTICOLA
 DATA BASE CATEGORY : ENVIRONMENTAL

4 HOUR DATA :

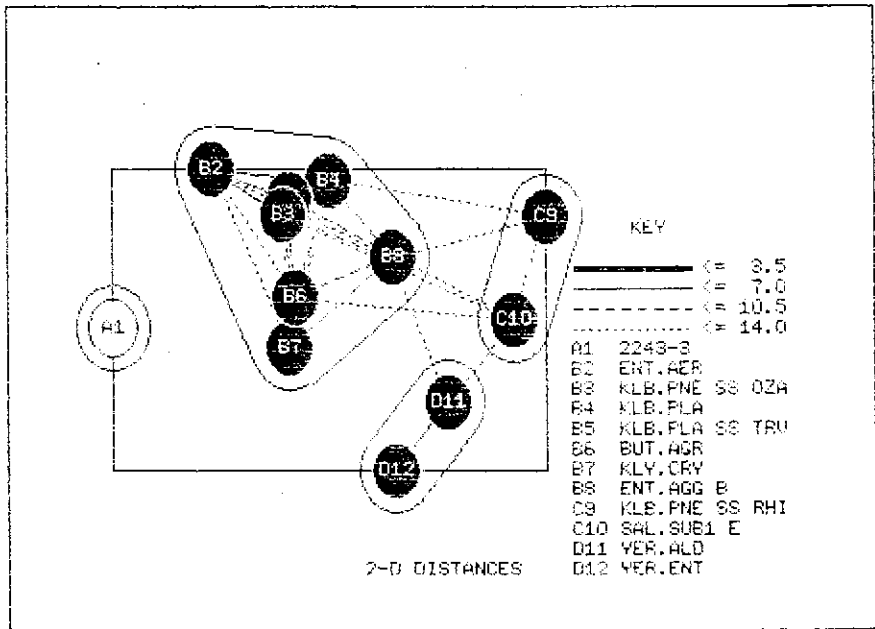
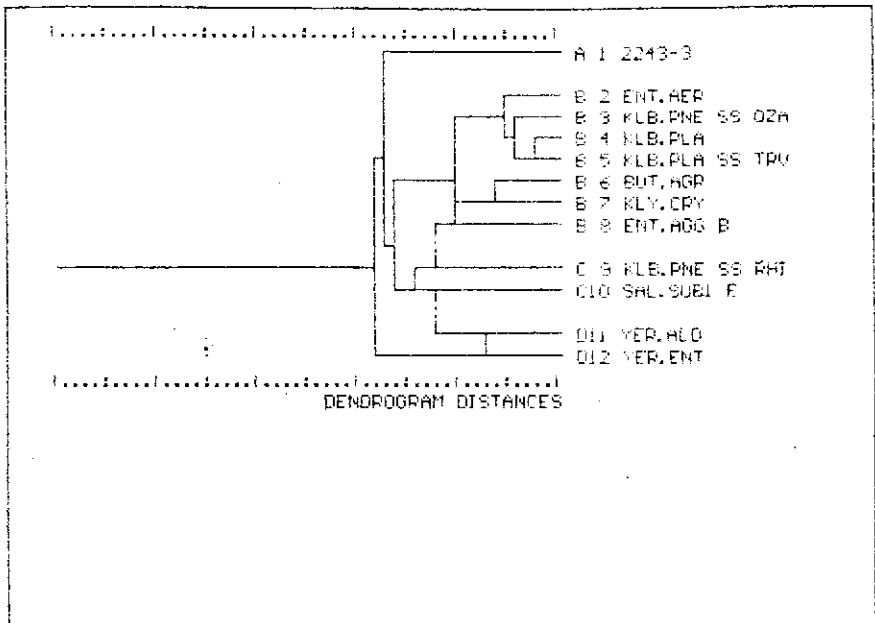
	1	2	3	4	5	6	7	8	9	10	11	12
A	0	0	100	100	80	76	76	100	100	100	100	100
B	0	92	100	100	100	100	100	100	12	100	100	84
C	92	100	100	92	100	100	100	100	0	0	52	100
D	92	40	100	100	0	100	100	24	100	20	84	0
E	100	0	0	0	0	100	100	0	100	100	0	100
F	100	84	100	100	100	100	100	100	100	100	100	100
G	100	88	0	60	28	92	0	100	100	100	0	40
H	72	100	100	100	0	52	0	0	100	100	100	100

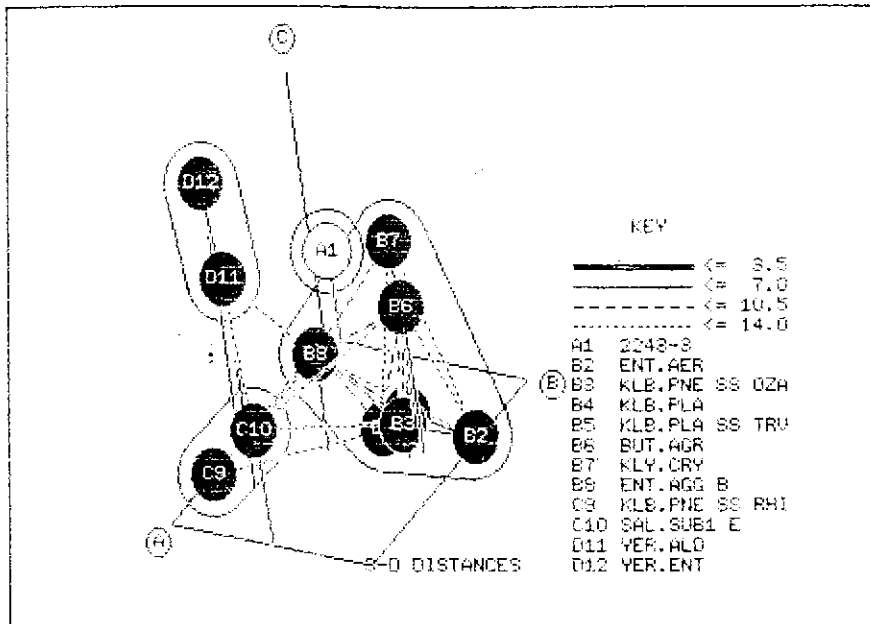
24 HOUR DATA :

	1	2	3	4	5	6	7	8	9	10	11	12
A	0	0	100	89	17	28	94	100	100	100	100	100
B	6	94	94	100	100	94	100	100	56	100	94	100
C	100	100	94	100	100	100	100	100	44	0	100	51
D	0	100	100	6	17	100	100	61	100	0	44	0
E	83	0	0	17	0	100	50	0	78	100	0	94
F	83	0	44	78	100	94	100	94	100	89	100	61
G	100	94	0	6	22	100	0	100	100	51	0	11
H	56	100	100	100	0	0	0	0	100	100	100	100

CLOSEST SPECIES :

- 1) 1.530 : KLEBSIELLA PLANTICOLA SS TREVISANII
- 2) 2.524 : KLEBSIELLA ORNITHINOLYTICA
- 3) 4.622 : KLEBSIELLA PNEUMONIAE SS OZAENAE
- 4) 6.029 : ENTEROBACTER AEROGENES
- 5) 6.518 : KLEBSIELLA OXYTOCA





MICROLOG (TM) 2, RELEASE 3.00

Date : 04/05/93
 Hour : 24
 Plate Type : 6P
 Plate # : 4
 Strain Name : 2243-4
 Strain # : L00
 Other Info : ?
 Input Mode : Reader : BIOLOG MICROSTATION
 Data Base : MicroLog 6P

POSITIVE/NEGATIVE DATA

XXX = percent change in optical density versus A1 control well
 <XXX> = positive, <XXX> = borderline, XXX = negative
 -XXX = percent change negative
 XXX+ = data negative or borderline, "=" ID choice positive : 90% of time
 XXX- = data positive or borderline, "=" ID choice positive : 10% of time

	1	2	3	4	5	6	7	8	9	10	11	12
A	0	19	29	<298>	<131>	3	-2	<203-	-127-	<527>	<439>	51
B	<259-	-2	<124>	<351>	<396>	6	<289>	<505>	<250>	<530>	<472>	<297-
C	36	2	<291>	<323>	<414>	<408>	9	<323-	-156-	<123>	9+	<116>
D	<222>	2	<276>	<119+>	<423>	<315>	<189>	<170>	1	<220>	<221>	<511>
E	4	<383>	< 53+>	-4	<223>	<142>	0	<181-	12	<233-	5	-14
F	0	<223-	<379>	23	<247>	<291>	<122>	-2	<414>	-15	<169>	<332>
G	54	<223>	<273>	<256>	<253>	<216>	<109>	4	<255>	<127-	13	<270>
H	<266>	<262>	<258>	<159>	26+	< 87-	12	16+	<592>	<543-	<560>	<380>

BIO-NUMBER : 0636-5677-1735-5767-2324-3353-3755-7517

NO IDENTIFICATION

	CLOSEST SPECIES	SIM.	DIST.	AVG.	MA
X =>	1) STAPHYLOCOCCUS LENTUS	0.121	18.319	2.000	2.8
50	2) STAPHYLOCOCCUS SCIURI	0.000	22.669	0.938	7.5
31	3) ENTEROCOCCUS GALLINARUM	0.000	23.799	0.594	1.6
81	4) BACILLUS SUBTILIS	0.000	24.069	2.667	5.7
75	5) STAPHYLOCOCCUS GALLINARUM	0.000	24.098	2.053	5.1
31	6) STAPHYLOCOCCUS FELIS	0.000	24.424	0.500	3.9
75	7) BACILLUS THERMOGLUCOSIDASIUS (55°C)	0.000	25.239	2.339	10.3
40	8) STAPHYLOCOCCUS AUREUS	0.000	26.105	0.958	5.4
38	9) BACILLUS AMYLOLIQUEFACIENS	0.000	26.112	2.250	4.7
25	10) BACILLUS PUMILUS	0.000	26.566	1.719	3.9
31	other :	-----	-----	-----	---

ABBREVIATED NAME : STA.LEN
 FULL NAME : STAPHYLOCOCCUS LENTUS
 DATA BASE CATEGORY : ENVIRONMENTAL

4 HOUR DATA :

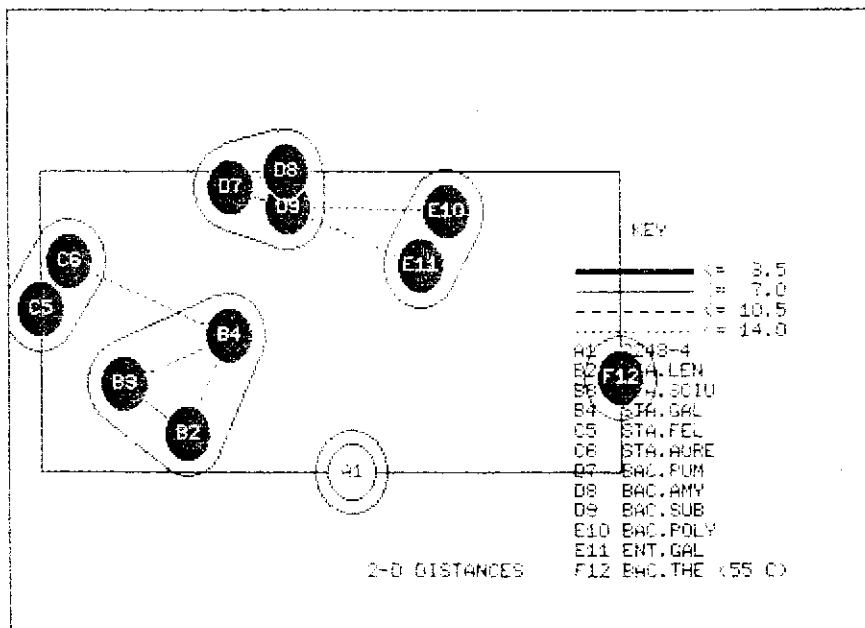
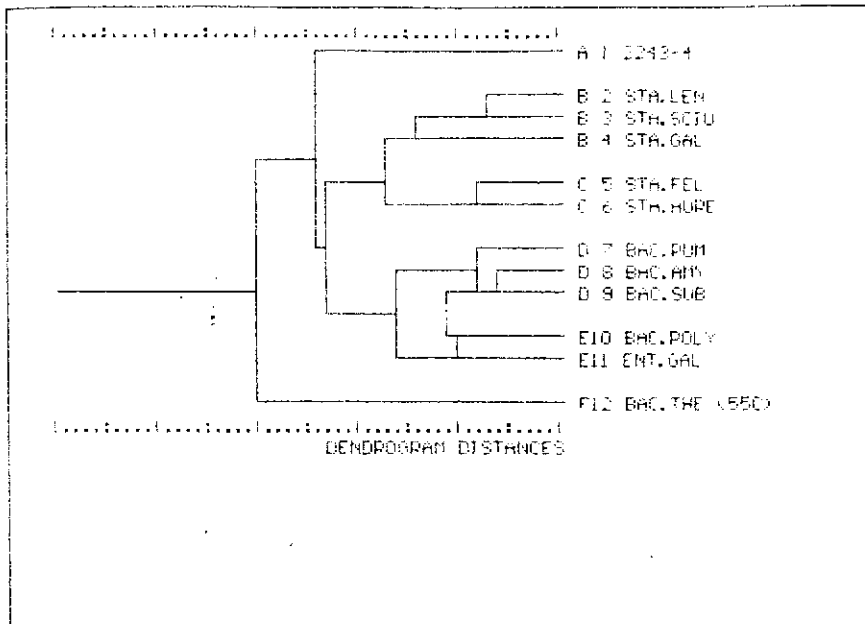
	1	2	3	4	5	6	7	8	9	10	11	12
A	0	0	0	100	100	0	63	0	0	100	100	75
B	0	0	50	100	100	0	100	0	100	75	88	0
C	25	0	100	100	100	100	25	75	50	0	100	50
D	63	0	100	100	100	13	100	100	13	100	75	100
E	0	100	100	0	100	75	0	0	0	0	0	0
F	38	0	75	0	75	100	50	0	75	75	75	75
G	25	75	88	75	25	75	75	75	100	0	0	75
H	50	100	75	100	100	0	75	75	0	0	0	0

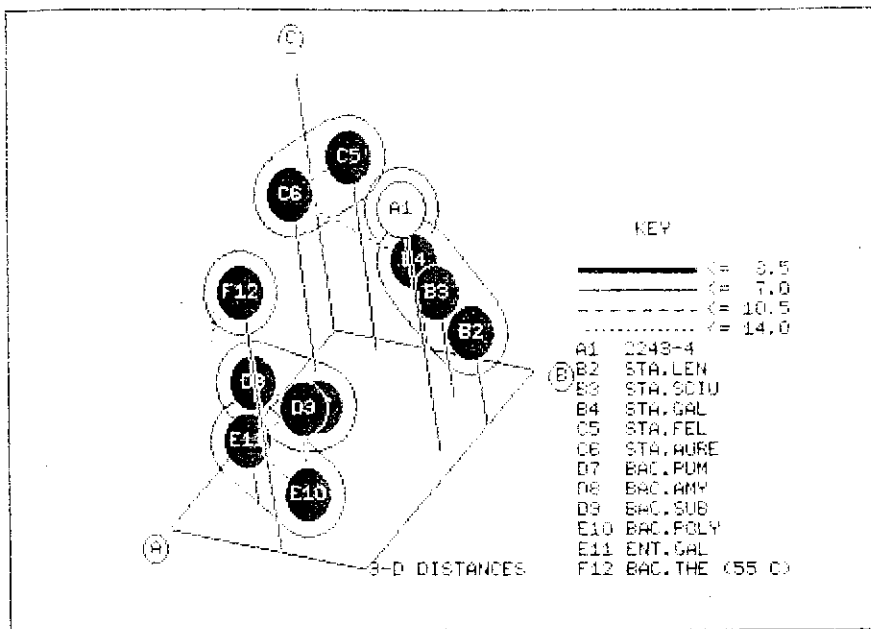
24 HOUR DATA :

	1	2	3	4	5	6	7	8	9	10	11	12
A	0	25	25	100	100	0	75	0	0	100	100	75
B	0	0	75	100	100	0	100	50	100	100	88	0
C	50	38	100	100	100	100	63	100	88	13	100	75
D	100	0	100	100	100	38	100	100	75	100	100	100
E	25	100	100	88	100	88	13	0	25	0	25	75
F	75	0	100	0	100	100	100	0	100	75	88	100
G	38	100	100	100	25	100	75	75	100	0	0	75
H	100	100	100	100	100	0	75	100	13	0	13	50

CLOSEST SPECIES :

- 1) 7.472 : STAPHYLOCOCCUS SCIURI
- 2) 14.104 : STAPHYLOCOCCUS GALLINARUM
- 3) 20.236 : BACILLUS PUMILUS
- 4) 20.708 : STAPHYLOCOCCUS XYLOSUS
- 5) 21.381 : STAPHYLOCOCCUS FELIS





MICROLOG (TM) 2, RELEASE 3.00

Date : 05/05/93
 Hour : 24
 Plate Type : GN
 Plate # : 2
 Strain Name : 2243-5
 Strain # : L00
 Other Info : ?
 Input Mode : Reader : BIOLOG MICROSTATION
 Data Base : MicroLog GN

POSITIVE/NEGATIVE DATA

XXX = percent change in optical density versus A1 control well
 <XXX> = positive, (XXX) = borderline, XXX = negative
 -XXX = percent change negative
 XXX+ = data negative or borderline, "=>" ID choice positive > 90% of time
 XXX- = data positive or borderline, "=>" ID choice positive < 10% of time

	1	2	3	4	5	6	7	8	9	10	11	12
A	0	5	<375>	<156>	<285>	<405>	<415>	<367>	{112+	<487>	{ 97+	<389>
B	-3	<505>	14+	<491>	<538>	<492>	<470>	<377>	25	<479>	<502>	<470>
C	<487>	<407>	47	<492>	<399>	<451>	<443>	<465>	<513>	82	<341>	<276>
D	<199>	<485>	<282>	76	<362>	<358>	<263>	48+	<312>	0	<340>	-14
E	<485>	-27	-34	4	-13	<417>	<265>	-7	-25+	<426>	-47	<302>
F	65	26	41	<477>	<389>	<449>	<524>	<514>	<393>	<500>	<476>	<515>
G	<449>	6+	-43	<464>	<191>	<451>	11	<273>	<495>	{120}	-50	-22
H	<326>	<358>	<377>	<211>	<290->	<527>	-40	-30	<324>	<219>	<353>	<301>

BIO-NUMBER : 1775-2767-6773-7352-4145-0777-4734-7717

SPECIES IDENTIFICATION : ENTEROBACTER AEROGENES

	CLOSEST SPECIES	SIM.....	DIST....	AVG.....	MA
X =>	1) ENTEROBACTER AEROGENES	0.575	6.256	3.313	6.8
81	2) ENTEROBACTER CLOACAE B	0.011	7.550	1.208	7.3
00	3) KLEBSIELLA PLANTICOLA SS TREVISANII	0.011	7.571	3.000	6.6
62	4) ENTEROBACTER TAYLORAE	0.001	6.513	1.913	2.8
81	5) KLEBSIELLA PNEUMONIAE B	0.000	6.697	2.406	5.3
56	6) KLEBSIELLA TERRIGENA	0.000	6.727	1.500	9.8
13	7) ENTEROBACTER ASBURIAE	0.000	6.733	1.656	6.4
31	8) KLEBSIELLA OXYTOCA	0.000	6.343	2.000	10.0
12	9) KLEBSIELLA ORNITHINOLYTICA	0.000	6.511	1.375	4.8
63	10) KLEBSIELLA PNEUMONIAE SS OZAENAE	0.000	6.573	2.500	4.1
75	other :	-----	-----	-----	---

ABBREVIATED NAME : ENT.AER
 FULL NAME : ENTEROBACTER AEROGENES
 DATA BASE CATEGORY : CLINICAL

4 HOUR DATA :

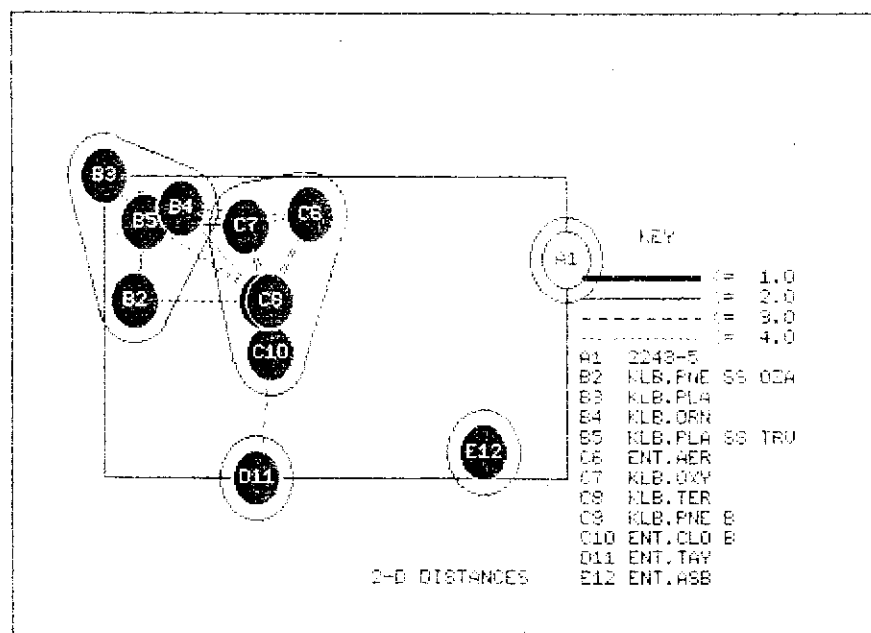
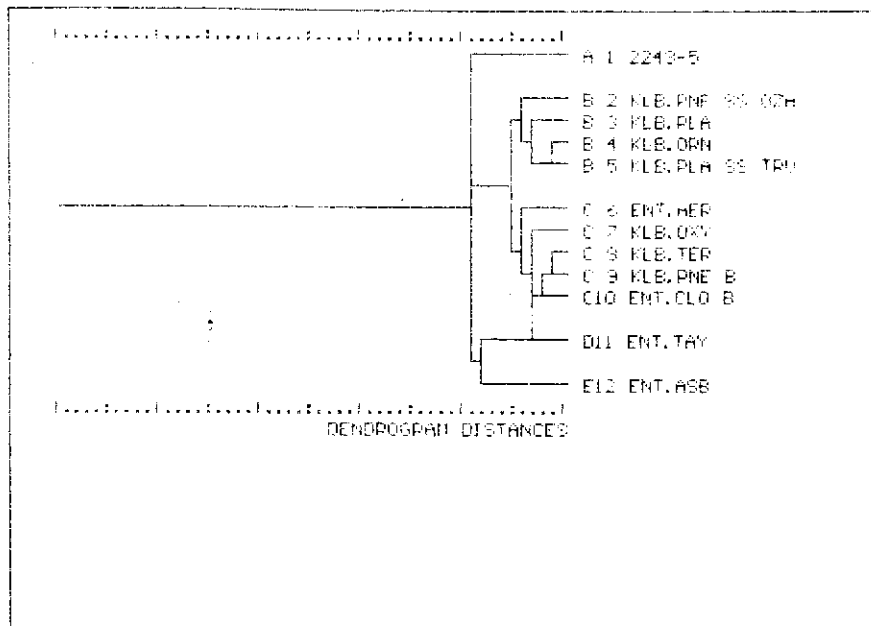
	1	2	3	4	5	6	7	8	9	10	11	12
A	0	8	100	100	57	50	74	85	100	84	100	100
B	0	66	100	100	100	70	100	70	16	100	100	73
C	100	100	100	91	100	100	100	100	43	0	16	100
D	100	89	100	100	100	93	100	100	92	54	70	0
E	100	0	0	12	0	100	100	0	100	100	0	100
F	100	100	100	100	100	100	100	100	100	100	100	100
G	100	100	0	100	85	100	0	100	100	100	0	70
H	100	100	92	82	0	100	0	0	100	100	51	100

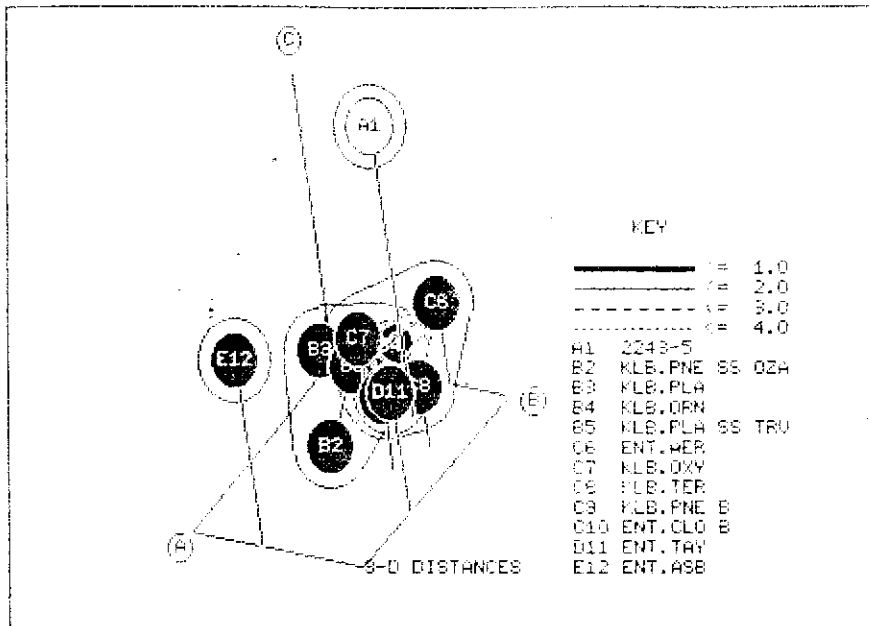
24 HOUR DATA :

	1	2	3	4	5	6	7	8	9	10	11	12
A	0	26	100	68	63	63	89	100	100	78	100	100
B	0	84	100	100	84	74	100	79	47	100	63	100
C	100	100	89	100	100	100	100	100	84	59	100	100
D	58	100	100	83	100	100	100	100	100	16	74	0
E	100	0	0	16	0	100	89	0	100	100	0	100
F	68	26	47	84	100	100	100	89	100	84	100	58
G	100	100	0	100	53	89	0	100	100	58	11	0
H	89	100	100	100	0	100	0	0	100	84	100	100

CLOSEST SPECIES :

- 1) 2.973 : KLEBSIELLA PNEUMONIAE B
- 2) 3.215 : KLEBSIELLA ORNITHINOLYTICA
- 3) 3.471 : KLEBSIELLA TERRIGENA
- 4) 3.620 : KLEBSIELLA PLANTICOLA SS TREVISANII
- 5) 4.200 : KLEBSIELLA OXYTOCA





Warranty and Limits of Liability

In accepting analytical work, we warrant the accuracy of test results under the conditions employed in the laboratory. The foregoing express warranty is exclusive and is given in lieu of all other warranties, expressed or implied. We disclaim any other warranties, expressed or implied, including a Warranty of Fitness for Particular Purpose and Warranty of Merchantability. We accept no legal responsibility for the purposes for which the client uses the test results.