GROUNDWATER REMEDIATION PROGRESS REPORT

5800 CHRISTIE AVENUE,
EMERYVILLE, CALIFORNIA

FEBRUARY 28, 1993

SUBMITTED TO:

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February 28, 1993

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

Subject: Groundwater Remediation Progress Report
5800 Christie Avenue, Emeryville, California

Dear Mr. Herring:

Enclosed please find a copy of the subject groundwater remediation report at the subject facility for your review.

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

Sincerely,

Walter W. Loo, RG CEG
President

CERTIFIED ENGINEERING GEOLOGIST
WALTER W. LOO
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STATE OF CALIFORNIA

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1.0 INTRODUCTION

Environmental & Technology Services(ETS) was retained by Croley & Herring Investment Company to perform the groundwater monitoring and remediation 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 remedial 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.

The general hydrogeology of the site is discussed in Sections 2.0 and 3.0.

ETS has considered and initiated electrochemical treatment and biotreatment for the contaminated groundwater located at the facility. These are discussed in Sections 4.0 and 5.0.

2.0 GROUNDWATER LEVEL AND FLOW CONDITIONS

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 January 11, 1993, elevation of water levels were increased in the three wells, as compared to the data collected in October 1992. Nevertheless, the groundwater flow direction remained in the same direction, flowing towards south (Figure 1). The hydraulic gradient was 0.011 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 2.

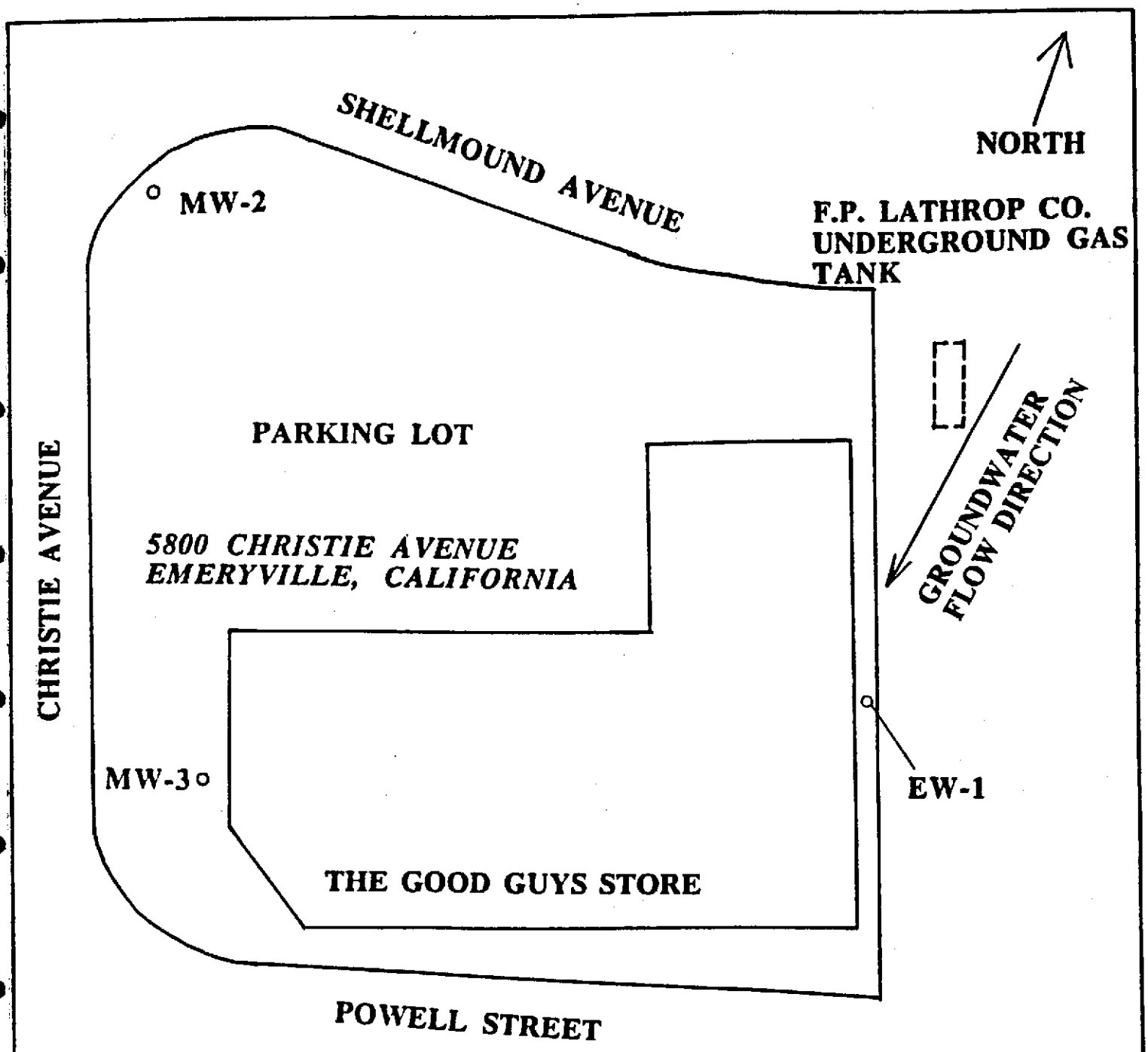

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FIGURE 1

LOCATION MAP

TABLE 1

SUMMARY OF WATER LEVEL DATA

WELL Name	Elev. of TOC (Ft-MSL)	11/6/89 DTW Ft.	11/6/89 SWL Ft.	2/20/90 DTW Ft.	2/20/90 SWL Ft.	5/31/90 DTW Ft.	5/31/90 SWL Ft.	9/7/90 DTW Ft.	9/7/90 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 DTW Ft.	12/4/90 SWL Ft.	4/16/91 DTW Ft.	4/16/91 SWL Ft.	7/3/91 DTW Ft.	7/3/91 SWL Ft.	10/14/91 DTW Ft.	10/14/91 SWL Ft.	1/9/92 DTW Ft.	1/9/92 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 DTW Ft.	7/15/92 SWL Ft.	10/19/92 DTW Ft.	10/19/92 SWL Ft.	1/11/93 DTW Ft.	1/11/93 SWL Ft.
EW-1	6.10	2.52	6.1	2.52	5.5	3.12
MW-2	4.42	3.00	4.77	2.65	2.9	4.92
MW-3	5.23	1.19	5.37	1.05	3.6	2.82

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
Flow Towards	S
Gradient	0.011

3.0 GROUNDWATER QUALITY

Groundwater samples collected were sent to a state-certified laoratory 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.

No VOCs were detected in wells MW-2 and MW-3 and these wells are no longer included in the quarterly monitoring program with the exception of groundwater level measurements.

The VOCs detected in well EW-1 from the groundwater sampling episodes are presented in Table 3.

During the soil closure effort, two(2) one time groundwater samples were collected downgradient from well EW-1 underlying the existing building slab. Both of these samples did not detect any halocarbons in the groundwater. **This appears to confirm the groundwater plume is a stagnated pool of unusable groundwater.**

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	10/12/91	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
TPH as GASOLINE	100.0	26.0	20.0
BENZENE	ND	ND	ND
TOLUENE	4.7	12.5	7.5
XYLENES	ND	ND	ND
ETHYLBENZENE	ND	ND	0.075
HALOCARBONS	2.461	5.07	0.065
PCE	ND	ND	0.042
TCE	0.68	0.27	0.023
1,1 DCE	ND	4.8	ND
1,2 DCE	0.6	ND	ND
1,1,1 TCA	0.42	ND	ND
1,1 DCA	0.6	ND	ND
1,2 DCA	0.11	ND	ND
VINYL CHLORIDE	0.15	ND	ND
CHLOROETHANE	ND	ND	ND
MET. CHLORIDE	ND	ND	ND
TOTAL VOCs	102.461	31.07	20.065

NA NOT ANALYSED
ND NOT DETECTED OR BELOW DETECTION LIMITS
VOCs VOLATILE ORGANIC COMPOUNDS (TPH PLUS TOX)

4.0 ELECTROCHEMICAL TREATMENT

Electrolysis and electro-osmosis are known electrochemical processes but little of the known technology have been applied in the remedial treatment of hazardous wastes. In-situ electrolysis can be applied in both permeable and impermeable media in the subsurface. It can be used as an in-situ neutralization process for pH control. It can also be used for electrochemical oxidation of organic compounds. In-situ electro-osmosis can only be applied with the presence of silty and clayey material in the subsurface. The mechanics of the electro-osmosis process is to cause imbalance of charge bonds in clayey material which results in clay compaction and chemcial desorption. The compaction and desorption processes will reduce the cleanup time and are particularly successful in the desorption of organic chemicals from clayey materials. In 1987, the electro-osmosis technique was applied to remove gasoline hydrocarbons in soils, (Van Doren and Bruell, 1987). A bench scale experiment was conducted to remove benzene using electro-osmosis. The laboratory study demonstrated the electro-osmostic process on removal of benzene from a water-saturated clay. Experimental results for benzene removal were compared with values predicted using a one-dimensional transport model which incorporated advection, dispersion and adsorption of the contaminant. The results indicated that electro-osmosis behaved as a hydraulic gradient and completely flushed benzene from the clay soil with pH decreased at the anode. Porosity of soil decreased in the vicinity of the anode but remained unchanged at the cathode. The electro-osmosis process proved to be an effective means of removing a contaminant from a relatively impermeable material.

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. **In particular, the benzene concentration was electrochemically oxidized to non-detect or less than 0.0005 mg/l.** The degree of the effectiveness and success on the halocarbons(TOX) cannot be assessed at this time because the readings were interfered with by the spreading of the upgradient gasoline plume.

However, the in-situ electrochemical treatment was effect where the underlying groundwater contains dissolved gasoline and hydrocarbons(BTEX) in the clayey Bay Mud. Three(3) electrode wells were installed for electrochemical treatment and groudwater sampling purposes.

During electrochemical treatment, groundwater samples in each of the wells were taken periodically. The samples were analyzed for pH, dissolved oxygen, temperature, and electrical conductivity in the field. These samples were also sent to a certified laboratory and analyzed for gasoline constituents, halocarbons, and other inorganic parameters. The electrical potential was supplied by a direct current electricity converter at 30 volts and a current of 7 amperes. No water was extracted from any of these wells throughout the demonstration period except for sampling. The initial concentration of TPH as gasoline and benzene in groundwater were 1.9 to 65 ppm and 0.002 to 1.2 ppm respectively. **After three(3) months of continuous passive in-situ electrochemical treatment, the TPH as gasoline and benzene were ~~cleanup~~** CLEANED UP **to less than 1.0 ppm and less than 0.0005 ppm respectively.**

5.0 BIOTREATMENT OF VOCs

Prevailing chlorinated solvents such as trichloroethene(TCE) and trichloroethane(TCA) can be found at most hazardous waste sites but there is no effective remedy to eliminate these compounds in a cost effective and timely manner. The pump and treat remediation method is only treating the symptoms of the problem in groundwater. The contaminated source area in soil or aquifer matrix is often neglected in site characterization and remediation efforts. Therefore, there are very few of these chlorinated solvents contaminated sites which have obtained case closure. The objective of this report is to demonstrate that such case closure can be obtained with known advanced biodegradation process.

Bioremediation can be defined as the utilization of naturally occurring bacteria to degrade hazardous organic compounds into non-hazardous compounds by the enhancement of the microbial ecology. The key parameters for the enhancement of the aerobic microbial ecology in soil and groundwater are oxygen, temperature, moisture and nutrients.

Successful laboratory demonstration of biodegradation of trichloroethene (TCE) by methanotrophic bacteria columns was achieved by EPA Ada Laboratory in 1985(Wilson, et al). In 1987, EPA Gulf Breeze Laboratory has successfully demonstrated the biodegradation of TCE by Pseudomonas putida through an aromatic pathway(Nelson, et al). In 1989, ETS successfully demonstrated the first field closure of the biodegradation of TCE and trichloroethane(TCA) together with toluene in soil through heat and nutrient enhancement by the growth of Bacilli and Pseudomonas fluorescens(Loo, 1991). In 1991, Standford University has demonstrated partial success on the biodegradation of TOX in groundwater by methanotrophic bacteria at Moffet Field, California(Roberts, et al). In 1988, a co-metabolic process was demonstrated in the laboratory on the biodegradation of TCE using glucose as a co-substrate which is non-toxic and non-hazardous(Vandenbergh, et al).

The biodegradation of chlorinated solvents (TOX) is a highly sought after solution to the widespread soil and groundwater contamination problems. However, most of the knowledge of biodegradation of TOX are found only in research laboratories. ETS is the pioneer in the applications of biodegradation of TOX in the field and had demonstrated this process two times at this site.

Underlying the site, 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.

This report presents the results of the successful demonstration of the glucose co-metabolic process on various chlorinated solvents(TOX) under the following conditions:

* **Laboratory bench scale** demonstration of TOX co-metabolic biodegradation using various sugar based co-substrate;

* **Ex-situ field demonstration** of the glucose co-metabolic process on TOX using granular activated carbon as the media;

* **In-situ passive biotreatment demonstration** of the glucose co-metabolic process on TOX in the silty and clayey Bay Mud "aquifer".

The glucose co-metabolic process is not only safe to use but also environmentally appealing because there is no addition of any toxic or hazardous chemicals into the subsurface.

5.1 LABORATORY BENCH SCALE DEMONSTRATION

A groundwater sample was collected from well EW1 of a property at Emeryville, California(Figure 1). The water was analysed for total heterotroph bacteria and specific bacteria identification. The total heterotrophic plate count is 2.12×10^5 CFU/ml. The predominant bacteria was identified as **Acidovorax facilis** by GC-FAME and **Alcaligenes faecalis Type II** by BIOLOG(Appendix A).

The GC-FAME microbial identification system is a fully automated gas chromatographic analytical system which identifies bacteria based on their unique fatty acid profiles. Because no subjective tests are required, the naming is highly objective and reproducible. All bacteria have a unique fatty acid composition. It is possible, using GC-FAME (Gas Chromatography Fatty Acid Methyl Ester) to identify bacteria to species and even subspecies on the basis of their fatty acid content. More than 300 fatty acids and related compounds have been found in bacteria analyzed in the laboratory. This large

number of fatty acids creates great 'naming' power within the system.The five steps to prepare GC ready extracts from a pure bacterial cultures are harvesting, saponification, methylation, extraction and base wash. The process removes the fatty acids from the cells and suspends them in a hexane base. This suspension is then injected into the GC where a flame detects the fatty acids. Each time a fatty acid is detected a peak is recorded on a chromatogram. By analyzing the peaks the GC data base can identify your bacteria. The data bases used to analyze the chromatograms consist of more than 60,000 analyses of strains obtained from experts and from culture collections. The cultures were collected from around the world to avoid potential geographic bias. Because the data bases are open ended the number of species in them is large and growing. The GC Microbial Identification System uses an external calibration mixture. This provides a quality control check throughout the analysis. The GC-FAME method of bacterial identification is by itself a precise method of bacterial identification.

The Biolog Microplate System for microbial identification and characterization by carbon source pattern recognition. The microplate technique allows us to characterize bacteria by 95 different carbon utilization tests on a single microplate. Each well in the microplate contains a carbon food source and a tetrazolium dye As the bacteria consume the carbon source in a well, the dye turns purple. Each species of bacteria creates a distinct pattern of purple dots that is recognized by the Biolog Microplate reader. To identify a given bacterial species, the bacteria (suspended in saline) are added to the microplate wells . The plates are incubated for 24 hours. and read in our microplate reader at 590 nm. The intensity of the purple color in each well is compared to a negative control well so that any purple color recorded above the control level is read as positive for the given carbon source. The dot pattern that results is the unique identification "signature" for the bacterial strain. The microplates are available for Gram negative (GN), Gram positive (GP) and E.coli/Salmonella (ES) Analysis. Custom analysis (MT) microplates are available and are particularly useful in performing Kinetic and Endpoint Assays We provide complete interpretation of all test results. The Biolog computer algorithms provide standardized settings which ensure repeatability and avoid any operator bias. We find the Biolog method to be excellent for strain characterization . When it is used in conjunction with the GC-FAME method, the combination.

The isolated bacteria was then used in the co-metabolic biodegradation of TCE with various sugars and their derivatives in an aerobic environment. The Kinetic and Endpoint assays enable us to measure the effectivness of specific bacteria to break down hydrocarbon contaminants such as gasoline,

(BTEX), diesel fuel, crude oil, pesticides, and other compounds (TCE, etc.). In all tests a 96 well microtiter plate is used to hold and incubate the bacteria in wells containing your contaminant(s) or a control medium. A dye present in the wells is activated by the microbe's oxidation of the carbon source. If your strains of bacteria utilize your contaminant(s), we will be able to measure that usage and growth by the color change and the increase in optical density of the well at 590 nm. In the Kinetics test, the optical densities are measured by a computerized optical reader every 10 minutes for 18 hours. Not only will this test tell you if your organism is using and breaking down the contaminant carbon sources, it will also tell you the rate at which the contaminant is being broken down. The Endpoint Assay is different only in that it does not tell you the rate at which the bacteria breaks down the contaminant. We use the same microtiter plates, incubated over night and the optical densities read once at 24 hours. This tells you whether or not your bacteria has broken down the carbon, and by how much, but not the rate at which it was done. The value of these tests is in their ability to project the effectiveness of a bacterium to break down a contaminant. This allows you to determine inexpensively the viability of bioremediation for a specific project. A Co-metabolic Study tells you which carbon sources will augment a bacterium's ability to breakdown a specific contaminant. Two microtiter plates, preloaded with 95 different carbon sources, are inoculated with the bacteria strain then the environmental contaminant is added to one plate. The plates are incubated, read and evaluated to determine which carbon source helped and which hindered the bacterium's ability to breakdown the contaminant.

The difference in growth activity for TCE with sugar and with sugar only will determine the stimulation efficiency of the particular sugar(Table 4). The following sugars and its derivatives have demonstrated superior co-metabolic stimulation on the biodegradation of TCE:

GLUCOSE-1-PHOSPHATE	2,3- BUTANEDIOL
URIDINE	ORNITHINE
TURINOSE	FRUCTOSE

5.2 EX-SITU FIELD DEMONSTRATION

This is a demonstration and closure of biodegradation of TOX in granular activated carbon(GAC) with the addition of glucose as a co-substrate. A total of ten 55-gallon drums of spent GAC were used for the demonstration. These spent GAC drums were used as emission control for a soil vapor extraction system (VES) established at 5800 Christie Street, Emeryville, California. The VES was closed in November, 1991. Due to the high

With TCE #1	With TCE #2	Ave With TCE		W/O TCE #1	W/O TCE #2	Ave W/O TCE	With - W/O TCE		Carbon source
1.607	1.544	1.5755		0.57	0.761	0.6655	0.91		Uridine
1.604	1.531	1.5675		0.661	0.689	0.675	0.8925	L-	Ornithine
1.611	1.614	1.6125		0.637	0.849	0.743	0.8695	2,3-	Butanediol
1.163	1.425	1.294		0.117	0.746	0.4315	0.8625		Turinose
1.367	1.696	1.5315		0.612	0.742	0.677	0.8545		Glucose-1-phosphate
1.161	1.544	1.3525		0.466	0.66	0.563	0.7895	D-	Fructose
1.151	1.627	1.389		0.54	0.719	0.6295	0.7595	a-	D-Lactose
1.152	1.623	1.3875		0.556	0.713	0.6345	0.753		Cellobiose
1.246	1.556	1.401		0.597	0.733	0.665	0.736		Hydroxy-L-proline
1.34	1.33	1.335		0.548	0.665	0.6065	0.7285		Glucuronamide
1.106	1.549	1.3275		0.549	0.654	0.6015	0.726	D-	Saccharic acid
1.095	1.463	1.279		0.527	0.611	0.569	0.71	L-	Arabinose
1.21	1.331	1.2705		0.552	0.573	0.5625	0.708		Maltose
1.364	1.364	1.364		0.637	0.689	0.663	0.701		Quinic acid

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TABLE 4

SUMMARY OF BENCH SCALE TCE CO-METABOLIC EVALUATION

disposal cost of the GAC, the authors decided to decontaminated the volatile organic chemicals (VOCs) adsorbed on the 1500 pounds GAC which averaged about 100,000 ppm. The authors selected electrochemical oxidation of the VOCs (both TOX and gasoline) by the application electrolysis on the GAC. The electrolysis treatment has successfully reduced the VOC concentration by 99.9%. The gasoline compounds (BTEX) in the GAC was below detection limits after treatment. The residual TOX in the GAC after treatment was at 190.95 ppm which was not good enough for disposal to a Class III sanitary landfill.

A heat enhanced biodegradation process was employed to degrade the residual TOX in the GAC. Acidovorax facilis bacteria found in a nearby contaiminated groundwater monitoring well EW1 was introduced together with glucose, nutrient and hydrogen peroxide into the GAC. And the water in each GAC unit was circulated for about 2 weeks under full enhancement conditions. The TOX was biodegraded down to 0.79 ppm in the GAC. This reflects a 99.6% biodegradation efficiency. Table 5 presents the results of this ex-situ demonstration on various chlorinated solvents such as PCE, TCE, DCE, TCA, DCA, CHLOROFORM AND BROMODICHLOROMETHANE using the glucose co-metabolic biodegradation process. After passing the LC50 test, the cleaned, non-hazardous GAC was disposed to the West Contra Costa Landfill after regulatory approval.

5.3 IN-SITU PASSIVE BIOTREATMENT DEMONSTRATION

Based on the successful ex-situ demonstration, the process is extended to the subsurface via a passive in-situ biodegradation of a TOX contaminated aquifer. Figure 2 presents the in-situ biotreatment system. Figure 3 depicts a cross-sectional view of the in-situ biotreatment system.

Diluted solution of glucose and hydrogen peroxide was percolated through the system of steel perforated tubes below the shallow groundwater table. The solution was first introduced in September, 1992. After two rounds of quarterly sample analyses, TCE was biodegraded with better than 90% efficiency and DCE, TCA, DCA and vinyl chloride were completely biodegraded by this co-metabolic process. Table 6 presents a summary of this in-situ passive biotreatment demonstration results. This demonstration is still on going to date.

TABLE 5

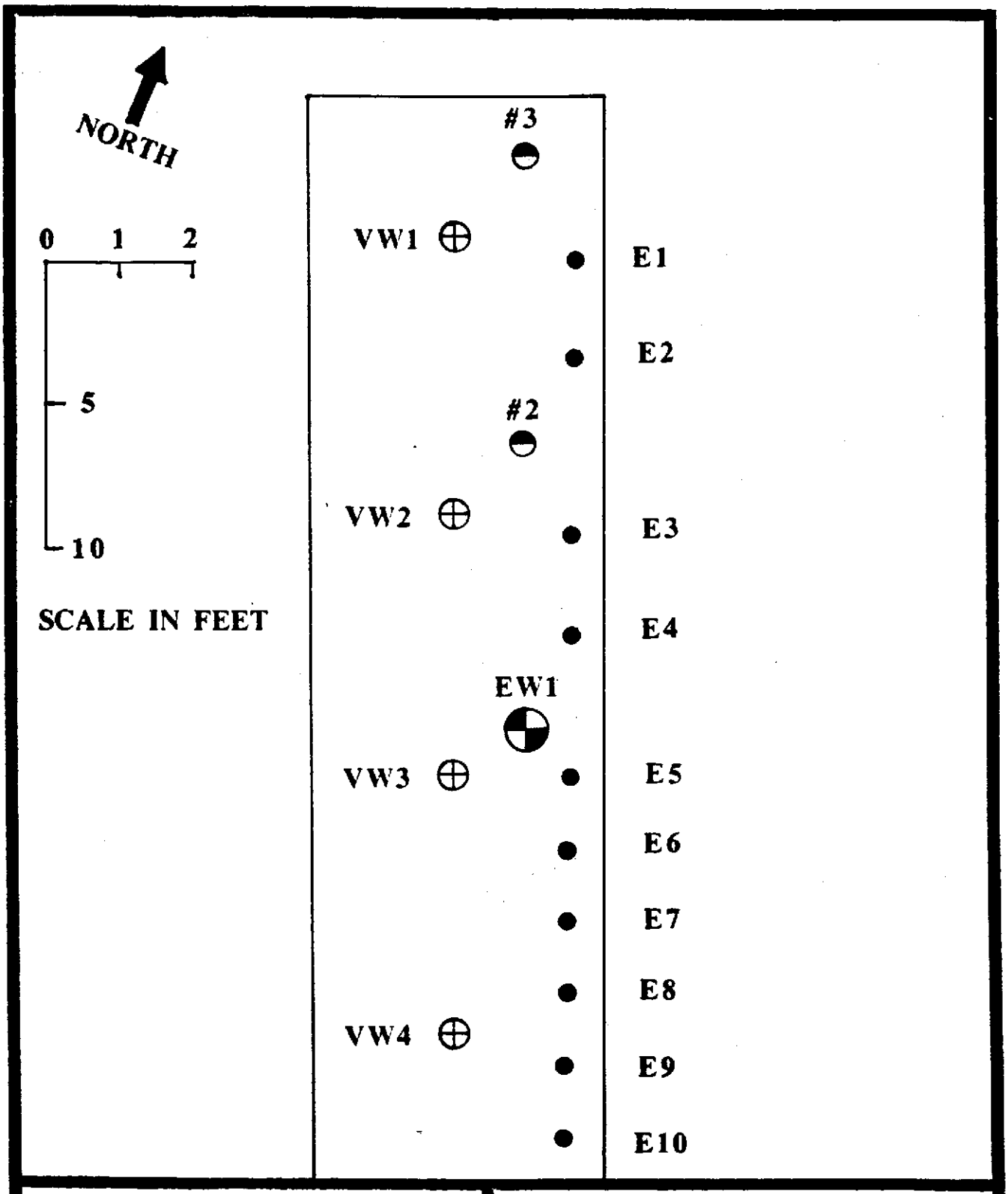
CO-METABOLIC BIODEGRADATION OF HALOCARBONS IN GRANULAR ACTIVATED CARBON

(All units in mg/Kg)

	BEFORE TREATMENT	AFTER TREATMENT
1,1 DCE	0.67	ND
cis 1,2 DCE	14.0	ND
1,1 DCA	3.8	0.16
CHLOROFORM	1.2	ND
1,1,1 TCA	89.0	ND
TCE	64.0	0.63
BROMODICHLOROMETHANE	18.0	ND
PCE	0.28	ND
TOX	190.95	0.79

Detection limit 0.005 mg/Kg

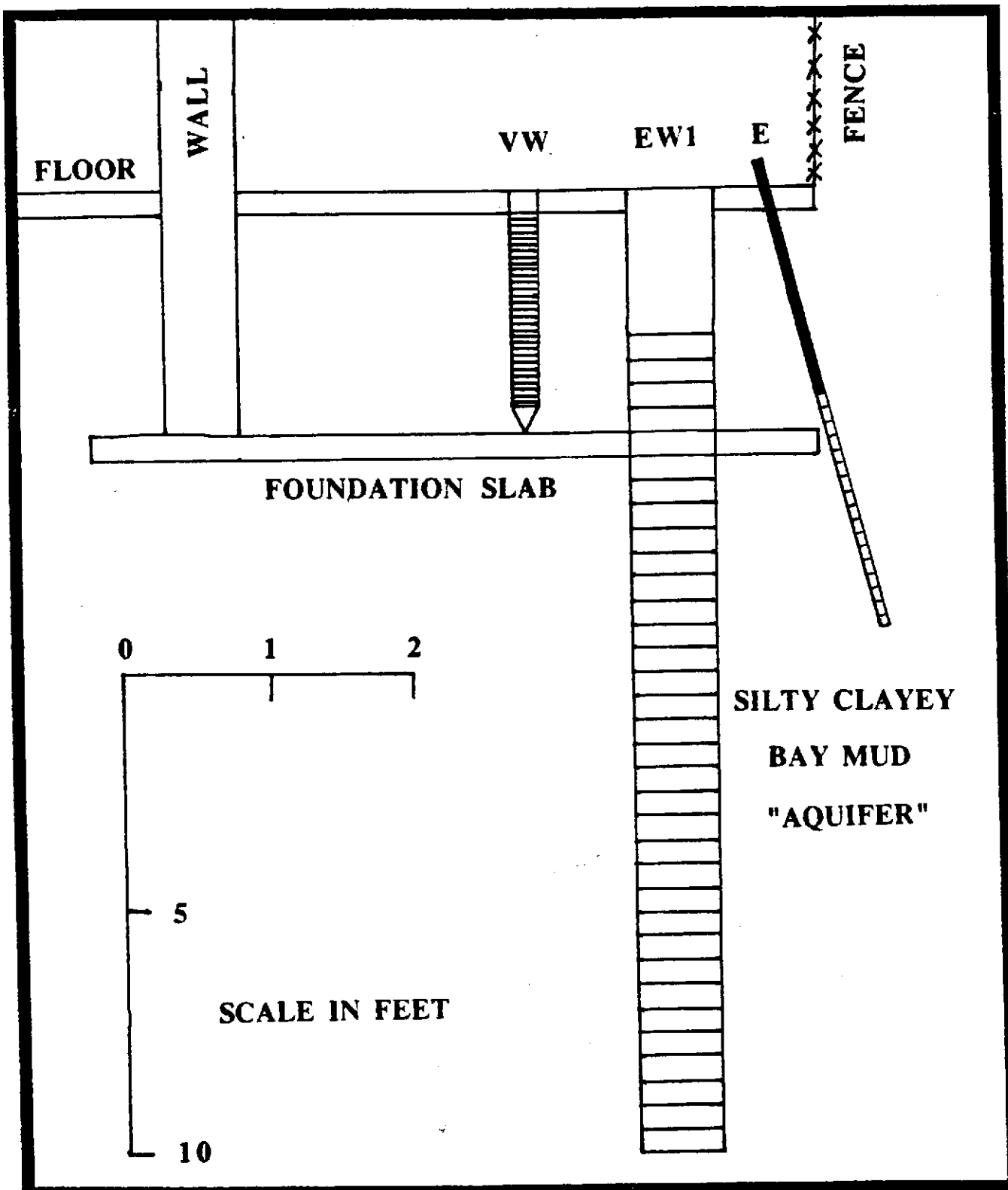
TOX DESTRUCTION EFFICIENCY 99.6%



ETS *ENVIRONMENT & TECHNOLOGY SERVICES*

FIGURE 2

IN-SITU TREATMENT SYSTEM



ETS *ENVIRONMENT & TECHNOLOGY SERVICES*

FIGURE 3

CROSS-SECTION DIAGRAM

TABLE 6

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	DESTRUCTION EFFICIENCY
TPH as GASOLINE	100.0	26.0	20.0	80%
BENZENE	ND	ND	ND	---
TOLUENE	4.7	12.5	7.5	40%
XYLENES	ND	ND	ND	---
ETHYLBENZENE	ND	ND	0.075	NEGATIVE
HALOCARBONS	2.461	5.07	0.065	98.7%
PCE	ND	ND	0.042	NEGATIVE
TCE	0.68	0.27	0.023	96.6%
1,1 DCE	ND	4.8	ND	100%
1,2 DCE	0.6	ND	ND	100%
1,1,1 TCA	0.42	ND	ND	100%
1,1 DCA	0.6	ND	ND	100%
1,2 DCA	0.11	ND	ND	100%
VINYL CHLORIDE	0.15	ND	ND	100%
CHLOROETHANE	ND	ND	ND	---
MET. CHLORIDE	ND	ND	ND	---
TOTAL VOCs	102.461	31.07	20.065	80.4%

NA NOT ANALYSED
ND NOT DETECTED OR BELOW DETECTION LIMITS
VOCs VOLATILE ORGANIC COMPOUNDS (TPH PLUS TOX)

6.0 REFERENCES

Loo, W. W., 1991, Heat Enhanced Bioremediation of Chlorinated Solvents and Toluene in Soil, Proceedings of HMCRI R & D Conference, Anaheim, California, p. 133-136.

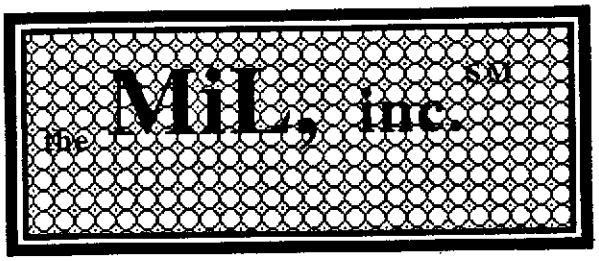
Nelson, M. J. K., et al, 1987, Biodegradation of TCE and Involvement of an Aromatic Biodegradative Pathway, Applied and Environmental Microbiology, May 1987, p. 949-954.

Roberts, P. V., et al, 1989, Biostimulation of Methanotrophic Bacteria to Transform Halogenated Alkenes for Aquifer Restoration, Proceedings of Petroleum Hydrocarbon Conference, Houston, Texas, p. 204-217.

Van Doren, E. P. and C.J. Bruell, 1987, "Electro-Osmotic Removal of Benzene from a Water Saturated Clay", Proc. of Petroleum Hydrocarbons and Organic Chemicals in Ground Water: Prevention, Detection and Restoration, Nov. 17-19, 1987, Houston, Texas, pp 107-126.

Vandenbergh, P. A., et al, 1988, Metabolism of Volatile Aliphatic Hydrocarbons by Pseudomonas fluorescens, Applied and Environmental Microbiology, vol. 54, p. 2578.

Wilson, J. T., et al, 1985, Biotransformation of TCE in Soil, Applied and Environmental Microbiology, January 1985, p. 242-243.



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GC-FAME and Biolog™ Analyses

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—1125

PO Number none given

November 10, 1992

Copy 12/10/92

Summary Report of Analysis
[No. 1125 Page 1 of 2]

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

November 10,1992

Sample Description:
Thu, Oct 22, 1992 - 1:33 PM: Received sample by U.S. Postal express. Sample included 3x40 ml vials to be treated as one sample. Request TPC, GC-FAME, and Biolog™. Also total nitrogen as NH3, and NO3. Co-metabolic growth study TCE using glucose at variable concentrations 10,100,1000,10000ppm, and standard nutrients and disolved oxygen(100ppm). Information on the vials:
Firm name:Chick
Project site:5800 Christe-Emery
Sample ID:EW-1
Date 10/19/92
Mon, Oct 19, 1992 - 5:02 PM: Called and indicated that a 3 x 40 ml sample would be sent to arrive on Wednesday, sample to be processed for TPC and total ID's by GC-FAME, then kinetics using TCE 10mg/l and glucose at various concentrations.
Must figure way to measure TCE decrease and glucose consumption at end of test.

Chain of Custody Record Information -
MiL, Inc. REPORT & Invoice No.: MILB-1125 Purchase Order —none

Processing:
[Standard Bacterial Plate Count - serial dilution method and direct spread plate count]
Within 10 minutes of reception an aliquot from the sample was checked for volume and then serially diluted. Each dilution was sterilely transfered in a laminar flow biological cabinet and placed on previously prepared and dried 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/ ml)	
Medium		
TSBA	**24 Hrs.**	**48 Hrs.**
Sample		
EW-1	2.12 x 105	same within error
Number of different colonies		
2		

The strains were picked and individually streaked out onto Trypticase Soybroth Agar [TSBA]. The TSBA plates was prepared for use in the GC-FAME analyses. The TSBA plates was processed after 24 hr incubation by [Method 1- Standard GC-FAME]. The strains were examined against both the newly installed & improved versions of Aerobe (TSBA [rev. **3.60**]) and the Clinical Aerobe (CLIN [rev. **3.60**]) databases . Because both strains were named the same strain 17-S-2 only was examined against version 3.0 of the Biolog™ datababase.

Final Results:
The client is strongly urged to examine the data sheets accompanying the chromatogram of the strain for alternate possible identities not summarized here. Should a question be raised on the basis of sample history, ecology and source, this additional information may be enlightening. See summary table on the below.

Summary GC-FAME/Biolog™							
Strain No.	**Primary ID by GC**	**Sim. Coeff.**	**Dist. Coeff.**	**ID by Biolog™**	**Plate Type**	**Sim. Coeff.**	**Dist. Coeff.**
1125-1	*Acidovorax facilis*	0.398	4.387	*Alcaligenes faecalis Type II*	GN	0.89	1.35
1125-2	*Acidovorax facilis*	0.246	5.411				

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:

Julie Kidney

Dr. Bruce C. Hemming - Operations Director

Ms. Julie K. Kidney - Asst. Lab Manager

ENVIRONMETRICS
2345 Millpark Drive
Maryland Heights, MO 63043
(314) 427-0550

MICROBE INOTECH LABORATORIES, INC.
1840 CRAIG ROAD
ST. LOUIS, MO 63146-4712

ATTN: BRUCE HEMMING

INVOICE # 19266
PO # MIL-173

ANALYSIS RESULTS

SAMPLE ID: MIL-1125-1
LAB ID: 9211177

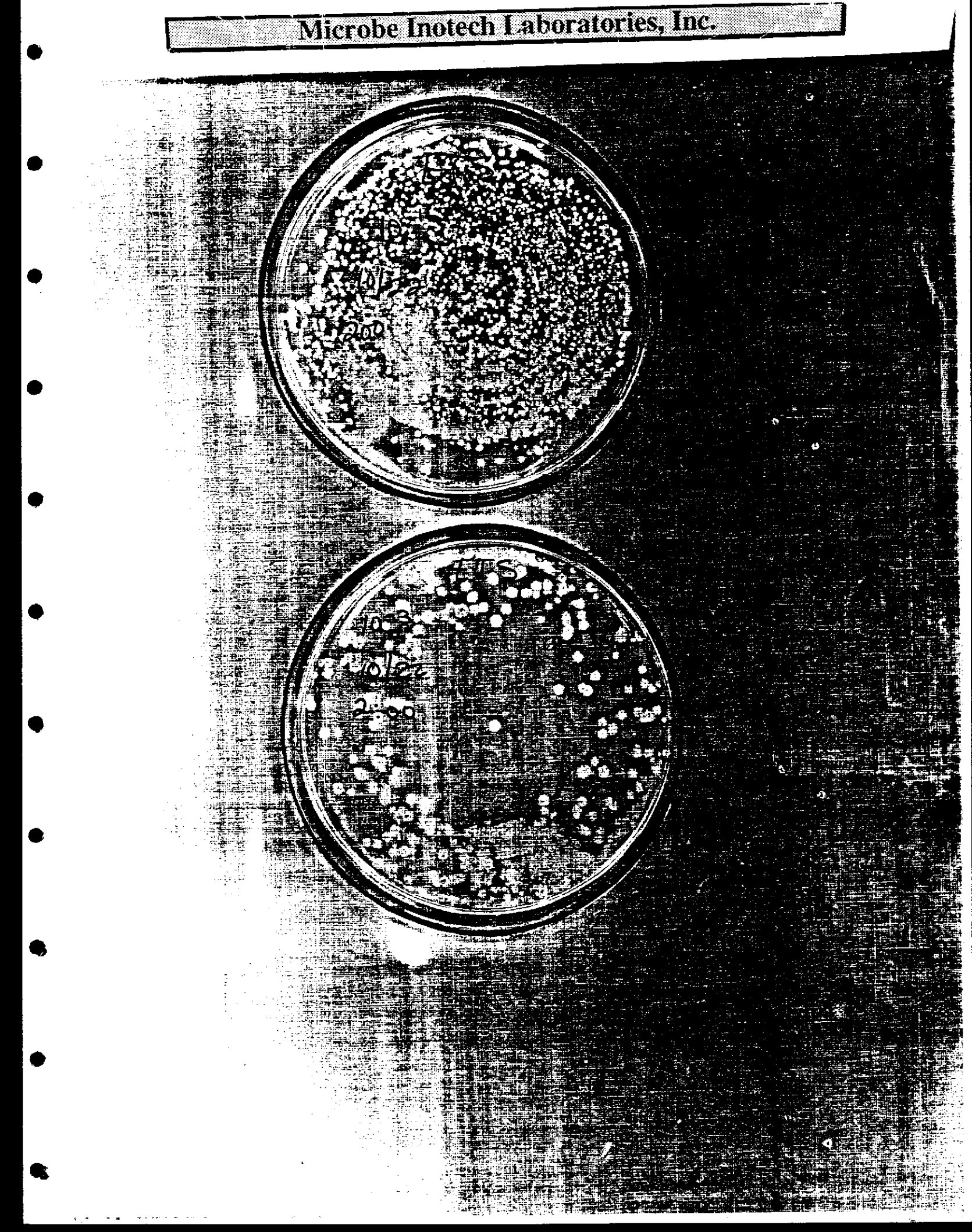
TEST PERFORMED	METHOD OF ANALYSIS	RESULTS
AMMONIA	EPA 350.3	137 mg/l
NITRATE	S.M. 4500NO_3D	10.4 mg/l
NITRITE	EPA 353.3	<0.10 mg/l

S.M.=STANDARD METHODS, 17TH EDITION

NOVEMBER 16, 1992

WAYNE L. COOPER
LABORATORY DIRECTOR

Microbe Inotech Laboratories, Inc.



Microbe Inotech Laboratories, Inc.

CALIB. 1 CALIBRATION STANDARD [AEROBE] 1-NOV-92 18:39:05 Area: 507960 % Named: 100
** GOOD PEAK MATCHING: PEAK POSITION MATCHING ERROR (RMS) IS 0.0018. **

CALIB. 1 CALIBRATION STANDARD [AEROBE] 1-NOV-92 19:09:27 Area: 506608 % Named: 100
** GOOD PEAK MATCHING: PEAK POSITION MATCHING ERROR (RMS) IS 0.0010. **

6 1125-1 [AEROBE] 1-NOV-92 19:39:46 Area: 248632 % Named: 100
TSBA [Rev 3.60] Acidovorax . . . . . 0.336 (48h, Pseudomonas facilis)
A. facilis . . . . . 0.336 (48h, Pseudomonas facilis)
Variovorax . . . . . 0.288 (Alcaligenes paradoxus)
V. paradoxus . . . . . 0.288 (Alcaligenes paradoxus)
V. p. GC subgroup B . . . . . 0.288 (Alcaligenes paradoxus)
Comamonas . . . . . 0.278 (Pseudomonas testosteroni)
C. testosteroni . . . . . 0.278 (Pseudomonas testosteroni)
C. acidovorans . . . . . 0.163 (Pseudomonas acidovorans)

7 1125-2 [AEROBE] 1-NOV-92 20:10:07 Area: 207312 % Named: 100
TSBA [Rev 3.60] Acidovorax . . . . . 0.183 (48h, Pseudomonas facilis)
A. facilis . . . . . 0.183 (48h, Pseudomonas facilis)
Hydrogenophaga . . . . . 0.128 (Pseudomonas pseudoflava)
H. pseudoflava . . . . . 0.128 (Pseudomonas pseudoflava)
Variovorax . . . . . 0.094 (Alcaligenes paradoxus)
V. paradoxus . . . . . 0.094 (Alcaligenes paradoxus)
V. p. GC subgroup B . . . . . 0.094 (Alcaligenes paradoxus)

Microbe Inotech Laboratories, Inc.

ID: 1 Calibration Standards — Date of run: 27-OCT-92 00:15:54
Bottle: 1 CALIBRATION [AEROBE]

RT	Area	Ar/Ht	Respon	ECL	Name	%	Comment 1	Comment 2
1.672	169352704	0.026	. . .	7.037	SOLVENT PEAK	. . .	< min rt	
1.889	880	0.020	. . .	7.459	. . . . .	. . .	< min rt	
1.959	4472	0.021	. . .	7.595	. . . . .	. . .		
2.030	488	0.027	. . .	7.733	. . . . .	. . .	< min area	
2.318	3016	0.022	. . .	8.294	. . . . .	. . .		
2.681	83216	0.024	1.259	9.000	9:0	5.08		
3.085	1552	0.025	. . .	9.786	. . . . .	. . .		
3.195	179632	0.026	1.178	10.000	10:0	10.27	Peak match -0.0014	
3.904	93360	0.029	1.112	11.000	11:0	5.04	Peak match -0.0037	
4.048	36568	0.030	1.103	11.154	10:0 2OH	1.96	Peak match 0.0029	
4.295	19424	0.032	1.088	11.419	10:0 3OH	1.03	Peak match 0.0025	
4.447	864	0.032	. . .	11.582	. . . . .	. . .		
4.837	200824	0.032	1.059	12.000	12:0	10.32	Peak match -0.0035	
6.003	102552	0.036	1.018	13.000	13:0	5.06	Peak match -0.0016	
7.385	213712	0.039	0.986	14.000	14:0	10.22	Peak match -0.0035	
8.932	108672	0.042	0.962	15.000	15:0	5.07	Peak match -0.0018	
9.271	43992	0.043	0.958	15.203	14:0 2OH	2.04	Peak match 0.0014	
9.745	22512	0.045	0.953	15.487	Sum In Feature 3 . .	1.04	Peak match 0.0024	14:0 3OH/16:1 ISO I
10.602	222304	0.044	0.945	16.000	16:0	10.19	Peak match -0.0031	
12.335	112088	0.046	0.932	17.000	17:0	5.07	Peak match -0.0017	
12.745	45832	0.048	0.930	17.233	16:0 2OH	2.07	Peak match 0.0020	
13.600	552	0.046	. . .	17.719	. . . . .	. . .		
14.095	229256	0.048	0.924	18.000	18:0	10.28	Peak match -0.0026	
15.125	8296	0.096	. . .	18.590	. . . . .	. . .	> max ar/ht	
15.340	3912	0.099	. . .	18.713	. . . . .	. . .	> max ar/ht	
15.511	2744	0.104	. . .	18.811	. . . . .	. . .	> max ar/ht	
15.840	114672	0.049	0.917	19.000	19:0	5.10	Peak match 0.0012	
17.061	1656	0.043	. . .	19.706	. . . . .	. . .		
17.569	229888	0.049	0.911	20.000	20:0	10.16		
18.554	5936	0.074	. . .	20.570	. . . . .	. . .	> max ar/ht	
18.744	4632	0.084	. . .	20.680	. . . . .	. . .	> max ar/ht	
18.932	3592	0.131	. . .	20.788	. . . . .	. . .	> max ar/ht	
19.127	5832	0.154	. . .	20.901	. . . . .	. . .	> max ar/ht	
*******	22512	. . . . .	. . .	SUMMED FEATURE 3 . .		1.04	12:0 ALDE ?	unknown 10.928
*******	. . . . .	. . . . .	. . .	. . . . .		. . .	16:1 ISO I/14:0 3OH	14:0 3OH/16:1 ISO I

Solvent Ar	Total Area	Named Area	% Named	Total Amnt	Mbr Ref	ECL Deviation	Ref ECL Shift
169352704	2078080	2058504	99.06	2060988	0	. . . . .	. . . . .

GOOD PEAK MATCHING: PEAK POSITION MATCHING ERROR (RMS) IS 0.0025.

Microbe Inotech Laboratories, Inc.

IO: 1 Calibration Standards Date of run: 27-OCT-92 00:46:33
Bottle: 1 CALIBRATION [AEROBE]

RT	Area	Ar/Ht	Respon	ECL	Name	%	Comment 1	Comment 2
1.671	135720192	0.025	. . .	7.047	SOLVENT PEAK	. . .	< min rt	
1.779	1792	0.025	. . .	7.258	. . . . .	. . .	< min rt	
1.885	800	0.023	. . .	7.465	. . . . .	. . .	< min rt	
1.954	3440	0.021	. . .	7.600	. . . . .	. . .	< min rt	
2.310	2432	0.023	. . .	8.295	. . . . .	. . .		
2.671	69640	0.024	1.244	9.000	9:0	5.11		
3.073	1224	0.025	. . .	9.785	. . . . .	. . .		
3.183	145688	0.026	1.178	10.000	10:0	10.12	Peak match -0.0011	
3.886	76520	0.029	1.121	11.000	11:0	5.05	Peak match -0.0012	
4.030	31472	0.030	1.113	11.155	10:0 2OH	2.06	Peak match 0.0019	
4.276	15784	0.031	1.099	11.420	10:0 3OH	1.02	Peak match 0.0022	
4.425	664	0.031	. . .	11.580	. . . . .	. . .		
4.815	162016	0.032	1.071	12.000	12:0	10.23	Peak match -0.0016	
5.974	83896	0.035	1.029	13.000	13:0	5.09	Peak match 0.0002	
7.349	174096	0.039	0.994	14.000	14:0	10.20	Peak match 0.0006	
8.892	89528	0.042	0.965	15.000	15:0	5.09	Peak match -0.0015	
9.230	38184	0.044	0.960	15.203	14:0 2OH	2.16	Peak match 0.0011	
9.702	18672	0.045	0.953	15.486	Sum In Feature 3 . .	1.05	Peak match 0.0028	14:0 3OH/16:1 ISO I
10.557	182648	0.045	0.942	16.000	16:0	10.14	Peak match -0.0011	
12.288	93328	0.047	0.925	17.000	17:0	5.09	Peak match -0.0008	
12.699	39768	0.048	0.922	17.234	16:0 2OH	2.16	Peak match 0.0011	
14.045	188752	0.047	0.913	18.000	18:0	10.16	Peak match 0.0006	
15.078	3072	0.050	. . .	18.591	. . . . .	. . .		
15.292	928	0.051	. . .	18.713	. . . . .	. . .		
15.794	94928	0.049	0.905	19.000	19:0	5.07	Peak match -0.0009	
17.010	1368	0.051	. . .	19.704	. . . . .	. . .		
17.521	191992	0.050	0.902	20.000	20:0	10.20		
18.506	3032	0.051	. . .	20.570	. . . . .	. . .		
18.697	1760	0.054	. . .	20.681	. . . . .	. . .		
*******	18672	. . . . .		. . .	SUMMED FEATURE 3 . .	1.05	12:0 ALDE ?	unknown 10.928
*******	. . . . .	. . . . .		. . .	. . . . .	. . .	16:1 ISO I/14:0 3OH	14:0 3OH/16:1 ISO I

Solvent Ar	Total Area	Named Area	% Named	Total Amnt	Nbr Ref	ECL Deviation	Ref ECL Shift
135720192	1704168	1696912	99.57	1696828	0	. . . . .	. . . . .

GOOD PEAK MATCHING: PEAK POSITION MATCHING ERROR (RMS) IS 0.0014.

Microbe Inotech Laboratories, Inc.

ID: 2 1125-1 Date of run: 27-OCT-92 01:16:52
Bottle: 2 SAMPLE [AEROBE]

RT	Area	Ar/Ht	Respon	ECL	Name	%	Comment 1	Comment 2
1.670	126759104	0.028	. . .	7.057	SOLVENT PEAK	. . .	< min rt	
1.760	3792	0.025	. . .	7.233	. . . . .	. . .	< min rt	
4.270	14856	0.031	1.099	11.425	10:0 3OH	4.50	ECL deviates	0.002
4.805	10072	0.032	1.071	12.000	12:0	2.98	ECL deviates	0.000 Reference -0.011
7.335	1920	0.041	0.994	14.008	14:0	0.53	ECL deviates	-0.000 Reference -0.010
8.877	1480	0.045	0.965	15.000	15:0	0.39	ECL deviates	-0.000 Reference -0.010
9.215	1432	0.046	0.960	15.203	14:0 2OH	0.38	ECL deviates	-0.002
10.241	161800	0.044	0.946	15.819	16:1 w7c	42.22	ECL deviates	0.002
10.542	101456	0.044	0.942	16.000	16:0	26.37	ECL deviates	0.000 Reference -0.009
12.079	7616	0.049	0.927	16.888	17:0 CYCLO	1.95	ECL deviates	0.000 Reference -0.009
12.269	1552	0.048	0.925	16.998	17:0	0.40	ECL deviates	-0.002
12.357	5512	0.051	0.925	17.048	16:1 2OH	1.41	ECL deviates	0.001
12.681	10504	0.048	0.922	17.233	16:0 2OH	2.67	ECL deviates	-0.002
13.716	62152	0.047	0.915	17.821	Sum In Feature 7 . .	15.68	ECL deviates	-0.001 18:1 w7c/w9t/w12t
15.604	2112	0.051	0.906	18.900	19:0 CYCLO w8c . . .	0.53	ECL deviates	-0.000 Reference -0.009
*******	62152	. . .	. . .	. . .	SUMMED FEATURE 7 . .	15.68	18:1 w7c/w9t/w12t	18:1 w9c/w12t/w7c
*******	. . . . .	. . .	. . .	. . .	. . . . .	. . .	18:1 w12t/w9t/w7c	

Solvent Ar	Total Area	Named Area	% Named	Total Amnt	Nbr Ref	ECL Deviation	Ref ECL Shift
126759104	382464	382464	100.00	362587	6	0.001	0.010

TSBA [Rev 3.60] Acidovorax . . . . . 0.398 (48h, Pseudomonas facilis)
A. facilis . . . . . 0.398 (48h, Pseudomonas facilis)
Hydrogenophaga . . . . . 0.254 (Pseudomonas pseudoflava)
H. pseudoflava . . . . . 0.254 (Pseudomonas pseudoflava)
Pseudomonas 0.212
P. syringae 0.212
P. s. maculicola 0.212
P. s. pisi 0.121
P. s. tomato 0.115
P. avenae . . . . . 0.148 (Pseudomonas rubrilineans)
P. a. avenae** . . . . . 0.148 (Pseudomonas rubrilineans)
P. coronafaciens 0.127

Microbe Inotech Laboratories, Inc.

Continue: 2 1125-1 [AEROBIC] 27-OCT-92 01:16:52

Comparison with TSBA [Rev 3.60]: Acidovorax-facilis(48h, Pseudomonas facilis) Distance: 4.387

```
                    0   5  10  15  20  25  30  35  40  45  50  55  60  65  70  75  80  85  90  95 100
                    .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
10:0 3OH. . . . . . -+-x    .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
12:0. . . . . . . . *-      .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
14:0. . . . . . . . x+      .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
15:0. . . . . . . . *--     .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
14:0 2OH. . . . . . *--     .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
16:1 w7c. . . . . .         .   .   .   .   .   .   .   .   --x+--  .   .   .   .   .   .   .   .   .
16:0. . . . . . . . .       .   .   .   .   .   -x-+---  .   .   .   .   .   .   .   .   .   .   .   .
17:0 CYCLO. . . . . -+x     .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
17:0. . . . . . . . *--     .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
16:1 2OH. . . . . . +x-     .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
16:0 2OH. . . . . . +--x    .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
19:0 CYCLO w8c. . . +x-     .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
SUMMED FEATURE 7. . .       .   .   -x--+----  .   .   .   .   .   .   .   .   .   .   .   .   .   .
```

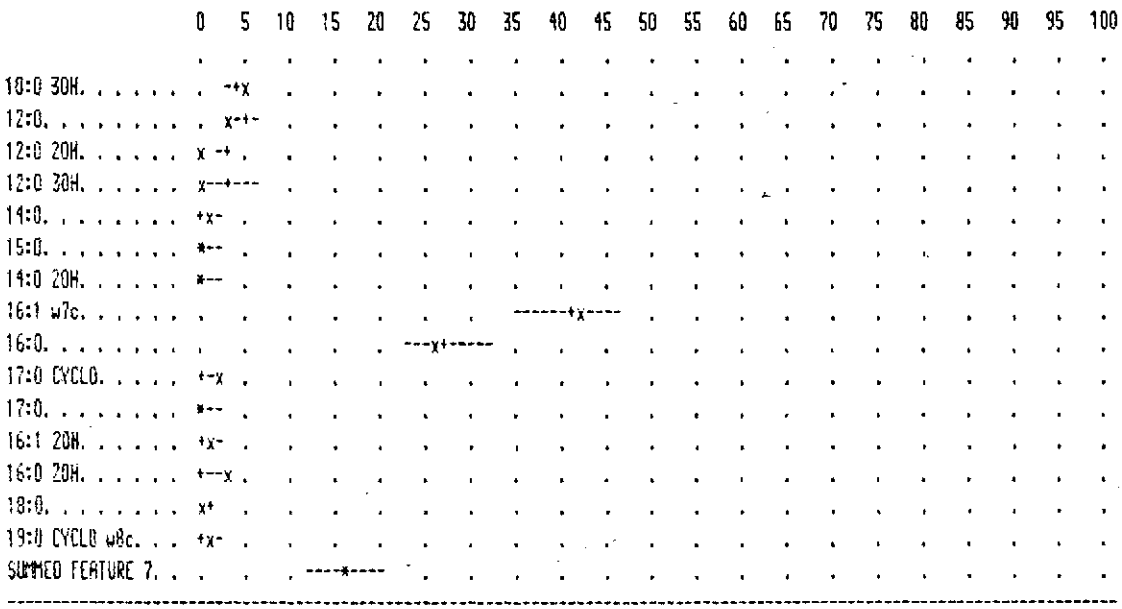
Comparison with TSBA [Rev 3.60]: Hydrogenophaga-pseudoflava(Pseudomonas pseudoflava) Distance: 5.348

```
                    0   5  10  15  20  25  30  35  40  45  50  55  60  65  70  75  80  85  90  95 100
                    .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
10:0 3OH. . . . . . .-+-x   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
12:0. . . . . . . . -+-x-.  .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
14:0. . . . . . . . .x--+-  .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
15:0. . . . . . . . *--     .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
14:0 2OH. . . . . . *--     .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
16:1 w7c alcohol. . x+-     .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
16:1 w7c. . . . . .         .   .   .   .   .   .   .   .   --x-----+------  .   .   .   .   .   .   .
16:0. . . . . . . . .       .   .   .   .   -------*------  .   .   .   .   .   .   .   .   .   .   .
17:0 CYCLO. . . . . --*---  .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
17:0. . . . . . . . *--     .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
16:1 2OH. . . . . . +x-     .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
16:0 2OH. . . . . . +--x    .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
18:0. . . . . . . . *-      .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
19:0 CYCLO w8c. . . +x-     .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
SUMMED FEATURE 7. . .       .   --------+x------  .   .   .   .   .   .   .   .   .   .   .   .   .
```

Microbe Inotech Laboratories, Inc.

Continue: 2 1125-1 [AEROBE] 27-OCT-92 01:16:52

Comparison with TSBA [Rev 3.60]: Pseudomonas-syringae-maculicola Distance: 5.695



Microbe Inotech Laboratories, Inc.

ID: 3 1125-2 Date of run: 27-OCT-92 01:47:16
Bottle: 3 SAMPLE [AEROBE]

RI	Area	Ar/Ht	Respon	ECL	Name	%	Comment 1	Comment 2
1.670	127785088	0.028	. . .	7.059	SOLVENT PEAK	. . .	< min rt	
1.759	3096	0.026	. . .	7.233	. . . . .	. . .	< min rt	
4.265	13584	0.032	1.099	11.422	10:0 3OH	4.59	ECL deviates -0.001	
4.800	10488	0.032	1.071	11.998	12:0	3.45	ECL deviates -0.002	
7.327	1968	0.041	0.994	13.998	14:0	0.60	ECL deviates -0.002	
8.869	1736	0.045	0.965	15.000	15:0	0.52	ECL deviates -0.000	Reference -0.015
9.207	1608	0.047	0.960	15.204	14:0 2OH	0.47	ECL deviates -0.001	
10.232	148920	0.044	0.946	15.819	16:1 w7c	43.32	ECL deviates 0.002	
10.532	85640	0.044	0.942	16.009	16:0	24.02	ECL deviates -0.000	
10.909	904	0.051	0.938	16.218	15:0 2OH	0.26	ECL deviates 0.001	
12.070	7336	0.048	0.927	16.888	17:0 CYCLO	2.09	ECL deviates 0.000	Reference -0.014
12.259	1392	0.048	0.925	16.998	17:0	0.40	ECL deviates -0.002	
12.345	7288	0.051	0.925	17.047	16:1 2OH	2.07	ECL deviates -0.000	
12.671	10304	0.048	0.922	17.232	16:0 2OH	2.92	ECL deviates -0.003	
13.706	49760	0.048	0.915	17.821	Sum In Feature 7 . .	14.00	ECL deviates -0.001	18:1 w7c/w9t/w12t
15.594	1752	0.049	0.906	18.900	19:0 CYCLO w8c . . .	0.49	ECL deviates -0.000	Reference -0.014
*******	49760	. . .	. . .	. . .	SUMMED FEATURE 7 . .	14.00	18:1 w7c/w9t/w12t	18:1 w9c/w12t/w7c
*******	. . .	. . .	. . .	. . .	. . . . .	. . .	18:1 w12t/w9t/w7c	

Solvent Ar	Total Area	Named Area	% Named	Total Amnt	Nbr Ref	ECL Deviation	Ref ECL Shift
127785088	342680	342680	100.00	325241	3	0.001	0.014

ECL SHIFT OR DEVIATION EXCEEDS 1.3000000000000000e-002. SYSTEM WILL RECALIBRAT

TSBA [Rev 3.60] Acidovorax . . . . . 0.246 (48h, Pseudomonas facilis)
A. facilis . . . . . 0.246 (48h, Pseudomonas facilis)
Hydrogenophaga . . . . . 0.196 (Pseudomonas pseudoflava)
H. pseudoflava . . . . . 0.196 (Pseudomonas pseudoflava)
Pseudomonas 0.153
P. syringae 0.153
P. s. maculicola 0.153
P. s. tomato 0.077
P. coronafaciens 0.082

Microbe Inotech Laboratories, Inc.

Continue: 3 1125-2 [AEROBE] 27-OCT-92 01:47:16

Comparison with TSBA [Rev 3.60]: Acidovorax-facilis(48h, Pseudomonas facilis) Distance: 5.411

	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
10:0 3OH.	.	-+-x	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
12:0.	.	*-.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
14:0.	.x	+	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
15:0.	+x-		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
14:0 2OH.	*--		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
16:1 w7c.	.		.	.	.	.	.	.	---*--												
16:0.	.		.	.	.	x--+---															
15:0 2OH.	*--		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
17:0 CYCLO.	-+x		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
17:0.	*--		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
16:1 2OH.	+-x		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
16:0 2OH.	+--x		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
19:0 CYCLO w8c.	*--		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
SUMMED FEATURE 7.	.		.	x----+----																	

Comparison with TSBA [Rev 3.60]: Hydrogenophaga-pseudoflava(Pseudomonas pseudoflava) Distance: 5.839

	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
10:0 3OH.	.	-+-x	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
12:0.	-+-x-		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
14:0.	.x--+-		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
15:0.	+x-		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
14:0 2OH.	*--		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
16:1 w7c alcohol.	x+-		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
16:1 w7c.	.		.	.	.	.	.	.	---x----+-------												
16:0.	.		.	.	-------x+-------																
15:0 2OH.	*--		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
17:0 CYCLO.	--*---		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
17:0.	*--		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
16:1 2OH.	+-x		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
16:0 2OH.	+--x		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
18:0.	*-		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
19:0 CYCLO w8c.	*--		.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
SUMMED FEATURE 7.	.		.	-------x+-------																	

Microbe Inotech Laboratories, Inc.

Continue: 3 1125-2 [AEROBE] 27-OCT-92 01:47:16

Comparison with TSBA [Rev 3.60]: Pseudomonas-syringae-maculicola Distance: 6.267

	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100
10:0 3OH.		-+x																			
12:0.		x-+-																			
12:0 2OH.	x	-+																			
12:0 3OH.	x	--+---																			
14:0.		+x-																			
15:0.		+x-																			
14:0 2OH.		*--																			
16:1 w7c.								------	+-	x---											
16:0.						--x-	+-----														
15:0 2OH.		*--																			
17:0 CYCLO.		+-x																			
17:0.		*--																			
16:1 2OH.		+-x																			
16:0 2OH.		+--x																			
18:0.		x+																			
19:0 CYCLO w8c.		*--																			
SUMMED FEATURE 7.				--x-	+----																

Microbe Inotech Laboratories, Inc.

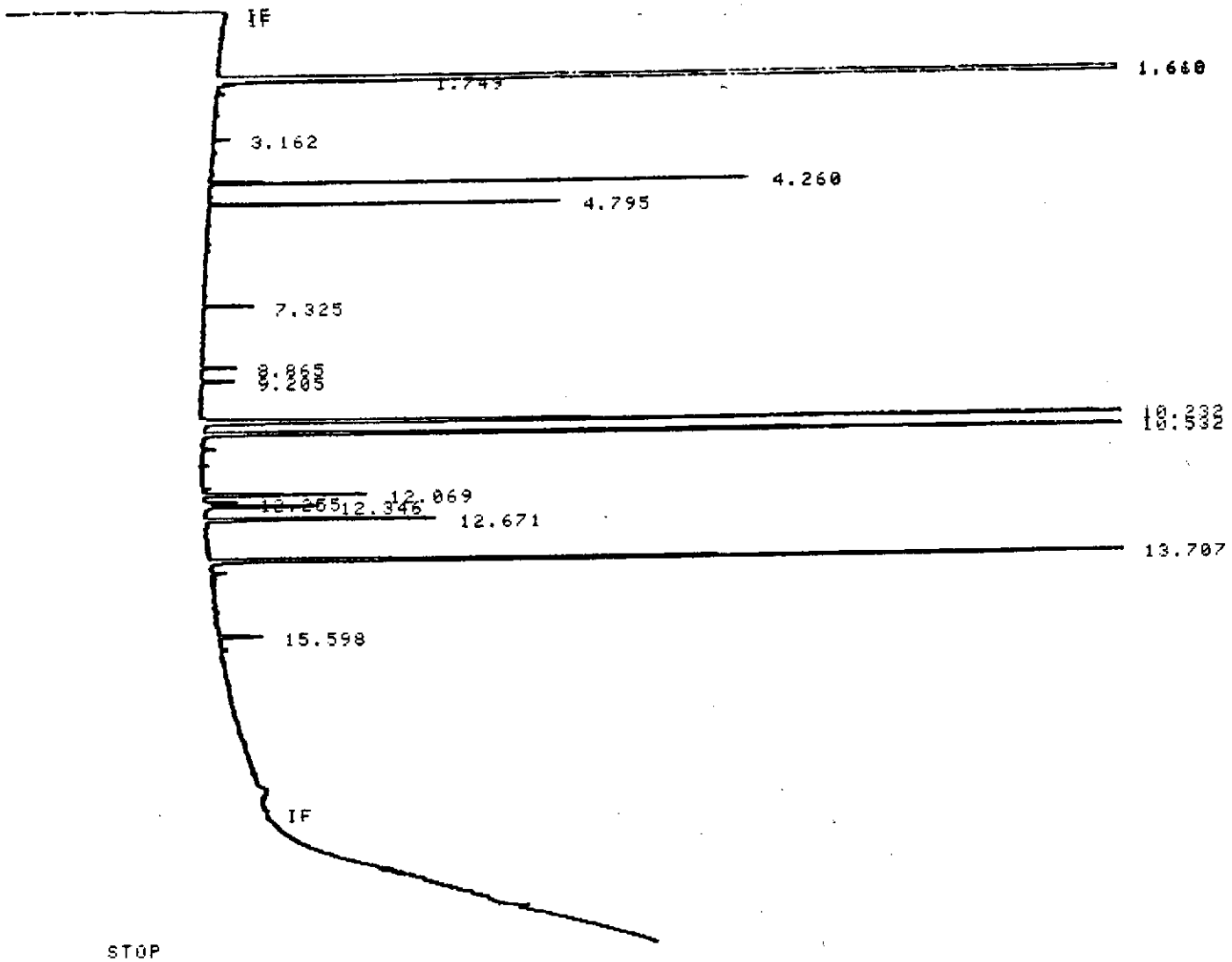
BOTILE: 2 ID#: 2TUE 27-OCT-92 13:52:45

FILE DATA:F92A27458

1125-1

RUN # 3 OCT 27, 1992 01:16:52

START



STOP

RUN # 3 OCT 27, 1992 01:16:52

START-No plot

END OF SIGNAL

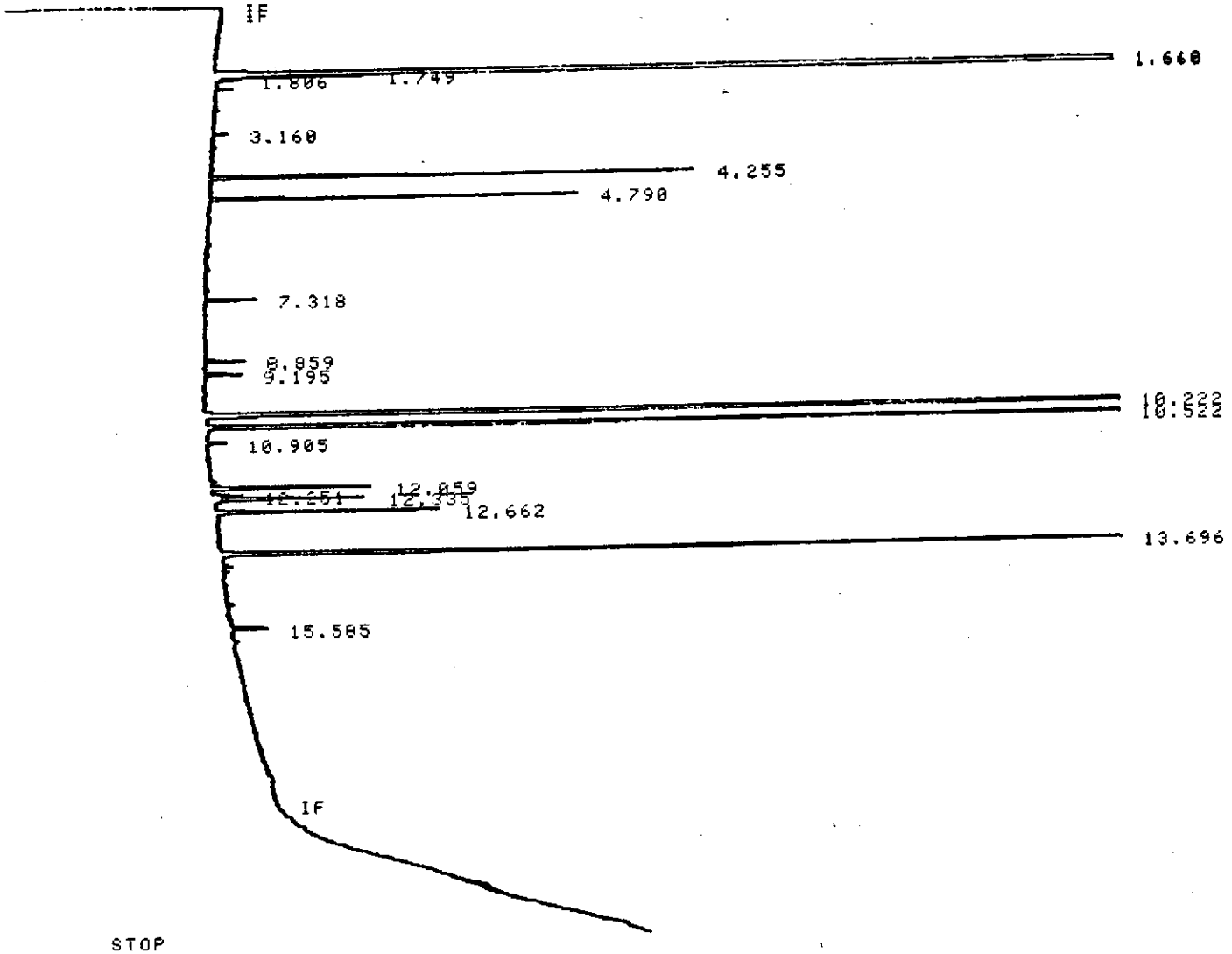
#

Microbe Inotech Laboratories, Inc.

BOTTLE: 3 ID#: 3TUE 27-OCT-92 14:23:14 FILE DATA:F92A27458

1125-2

RUN # 4 OCT 27, 1992 01:47:16
START



STOP

RUN # 4 OCT 27, 1992 01:47:16
START-No plot
END OF SIGNAL

Biological Data
24 Hr Time Point

Microbe Inotech Laboratories, Inc.

Date : 29/10/92
Hour : 24
Plate Type : GN
Plate # : 1
Strain Name : 1125
Strain # : ETS
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	15	7	13	<435>	<408>	2	7	0	10	0	3
B	19	12	7	3	-1	7	4	1	-7	-1	8	3
C	10	25	20	3	10	4	4	14	4	23	<619>	<681>
D	<575>	<559>	20	<483>	15	1	<238>	10	6	<497>	<601>	<236>
E	<236>	<213>	<507>	<508>	<134>	<749>	25	<524>	27	5	<487>	<657>
F	<552>	<716>	7	<148>	<182>	<137>	<248>	<680>	<626>	<662>	11	(49)
G	(65)	15	<290>	11	<150>	<397>	<716>	7	(104)	<324>	6	5
H	<553>	<543>	5	11	12	4	7	(26-	15	20	7	8

BIO-NUMBER : 0300-0000-0003-6447-7723-6774-1354-6000

SPECIES IDENTIFICATION : ALCALIGENES FAECALIS TYPE II

X	CLOSEST SPECIES :	SIM	DIST	AVG	MA
=> 94	1) ALCALIGENES FAECALIS TYPE II	0.890	1.350	1.938	5.0
63	2) COMAMONAS ACIDOVORANS	0.001	3.547	2.250	6.8
25	3) ALCALIGENES DENITRIFICANS/PIECHAUDII	0.001	3.818	0.857	3.8
81	4) COMAMONAS TESTOSTERONI	0.000	4.233	1.688	5.1
44	5) CDC GROUP IVC-2	0.000	4.338	0.101	1.6
44	6) COMAMONAS TERRIGENA	0.000	5.656	1.938	8.3
50	7) ACINETOBACTER SPECIES GROUP B3	0.000	6.181	0.234	4.6
44	8) ALCALIGENES EUTROPHUS	0.000	6.490	0.076	1.6
31	9) ALCALIGENES XYLOSOXYDANS SS XYLOSOXYDANS	0.000	6.519	0.604	3.3
13	10) PSEUDOMONAS PSEUDOALCALIGENES	0.000	6.532	1.750	7.2
--	other :	-----	-----	-----	---

Microbe Inotech Laboratories, Inc.

ABBREVIATED NAME : ALC.FAE TYPE II
FULL NAME : ALCALIGENES FAECALIS TYPE II
DATA BASE CATEGORY : CLINICAL

4 HOUR DATA :

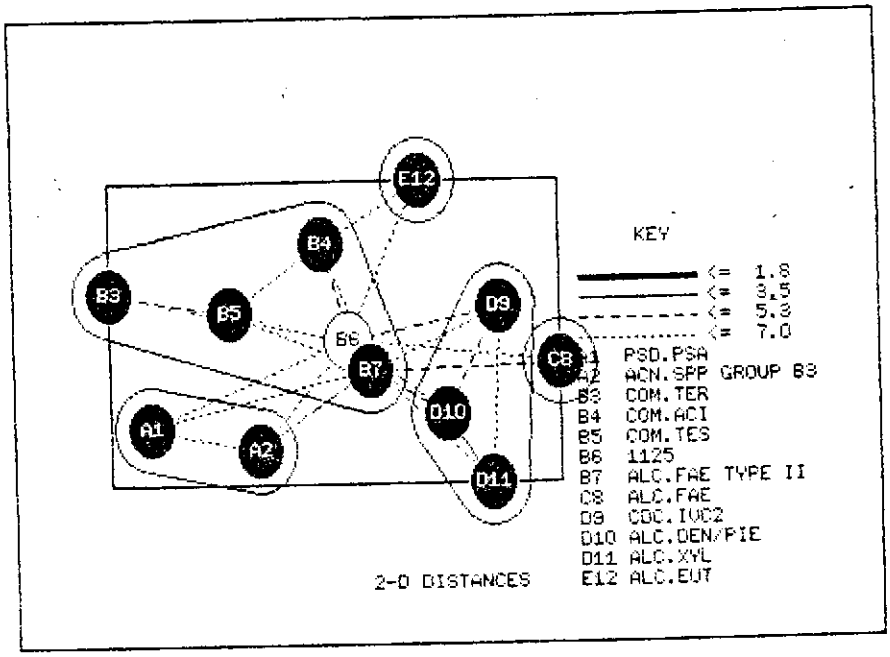
	1	2	3	4	5	6	7	8	9	10	11	12
A	0	16	16	52	52	52	0	8	0	0	0	0
B	20	0	0	0	0	0	0	0	0	0	0	0
C	0	16	8	0	8	0	0	0	0	0	76	76
D	92	44	28	60	0	8	28	8	16	76	100	0
E	52	28	92	76	64	100	28	80	24	0	40	92
F	92	92	16	48	84	76	16	92	84	100	12	40
G	36	16	84	44	88	88	56	44	60	24	0	28
H	52	36	12	0	24	12	0	12	8	0	0	0

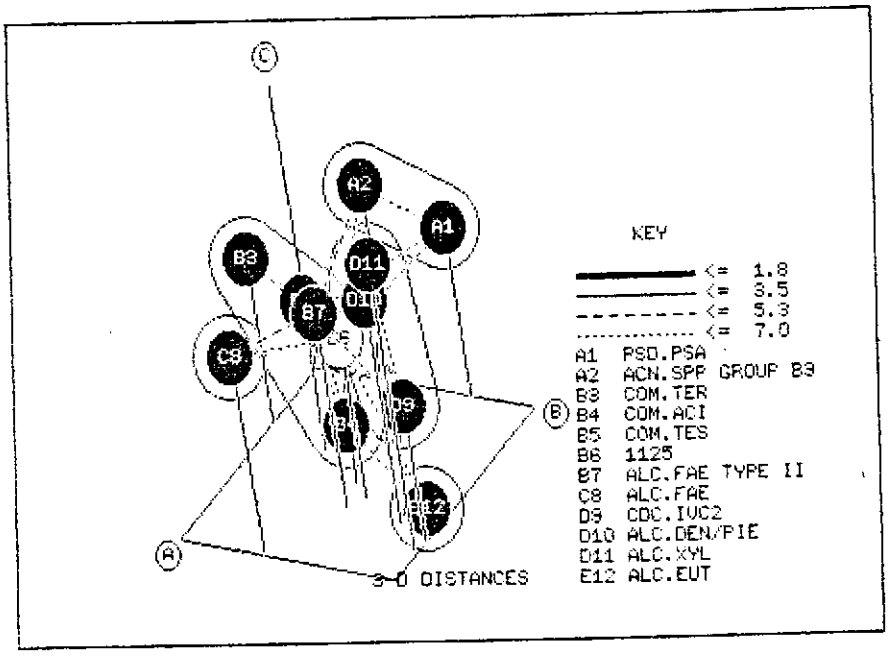
24 HOUR DATA :

	1	2	3	4	5	6	7	8	9	10	11	12
A	0	0	20	16	88	88	0	0	0	0	0	0
B	0	0	0	0	0	0	0	0	0	0	0	0
C	0	0	0	0	0	0	0	0	0	0	100	100
D	100	88	52	64	0	20	44	0	20	100	100	24
E	80	56	100	68	100	100	20	100	36	0	44	100
F	100	100	20	100	100	100	32	100	92	100	0	16
G	60	0	92	40	100	100	60	68	80	72	0	40
H	64	32	8	0	36	8	0	0	40	8	0	0

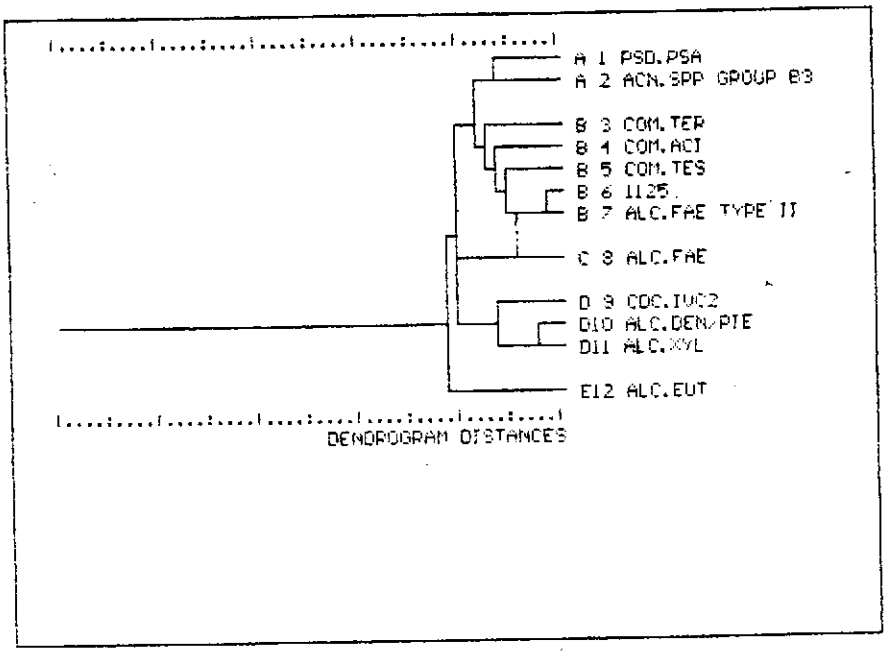
CLOSEST SPECIES :
1) 4.115 : ALCALIGENES FAECALIS SS FAECALIS
2) 4.927 : BORDETELLA BRONCHISEPTICA
3) 5.161 : AQUASPIRILLUM PUTRIDICONCHYLIUM
4) 5.247 : ACINETOBACTER SPECIES GROUP B3
5) 5.450 : ALCALIGENES DENITRIFICANS/PIECHAUDII

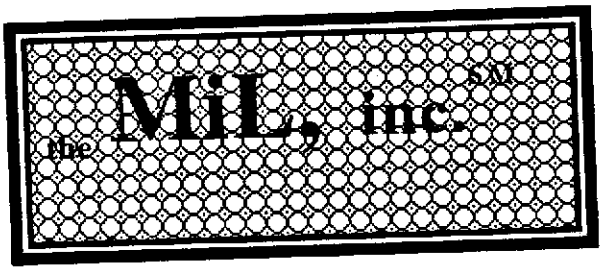
Microbe Inotech Laboratories, Inc.





Microbe Inotech Laboratories, Inc.





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

Total Plate Count & Bacterial Identification

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—1185

PO Number None

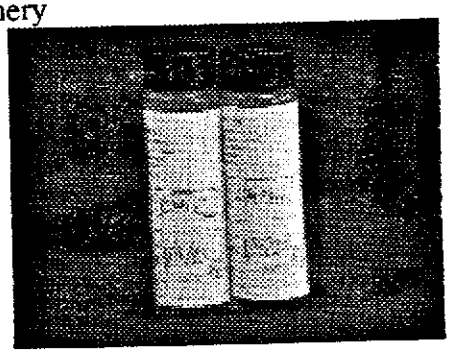
January 28, 1993

Summary Report of Analysis

January 28, 1993

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

Sample Description:
Tue, Jan 19, 1993 - 4:26 PM: Received by Priority Mail two 40 ml vials of one sample designated EW-1. Requested THPC and GC-FAME/Biolog ID of all colony types.
Firm name:Chick
Project site:5800 Christe-Emery



Chain of Custody Record Information -
MiL, Inc. REPORT & Invoice No.: MILB-1185 Purchase Order —none

Processing:
[Standard Bacterial Plate Count - serial dilution method and direct spread plate count] Within 10 minutes of reception an aliquot from the sample was checked for volume and then serially diluted. Each dilution was sterilely transfered in a laminar flow biological cabinet and placed on previously prepared and dried TSBA medium in Petri plates. Observations for colony forming units (CFU) were made at 24 and 48 hrs. of incubation at 28°C for the sample. Colony differentiation was noted at 48 hrs.

Summary Final Results—Total Heterotrophic Plate Count:

DATA:	Direct Count: Colony Forming Units (CFU/ ml)	
Medium		
TSBA	**24 Hrs.**	**48 Hrs.**
Sample		
EW-1	8.0×10^6	8.7×10^6

Number of morphologically different colony types
1

The strain was picked and streaked out onto Trypticase Soybroth Agar [TSBA]. The TSBA plate was prepared for use in the GC-FAME analyses after 24 hr incubation, by [Method 1- Standard GC-FAME]. The strain was examined against both the newly installed & improved versions of Aerobe (TSBA [rev. **3.60**]) and the Clinical Aerobe (CLIN [rev. **3.60**]) databases .

Final Results:
The client is strongly urged to examine the data sheets accompanying the chromatogram of the strain for alternate possible identities not summarized here. Should a question be raised on the basis of sample history, ecology and source, this additional information may be enlightening. See summary table on the below.

Summary GC-FAME/Biolog™							
Strain No.	**Primary ID by GC**	**Sim. Coeff.**	**Dist. Coeff.**	**ID by Biolog™**	**Plate Type**	**Sim. Coeff.**	**Dist. Coeff.**
1185	*Acinetobacter haemolyticus*	0.244	5.43	*Alcaligenes faecalis type II*	GN	0.795	1.914

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:

Julie Kidney

Dr. Bruce C. Hemming - Operations Director

Ms. Julie K. Kidney - Asst. Lab Manager

Microbe Inotech Laboratories, Inc.

DATA:F93122446 25-JAN-93 10:08:00

CALIB. 1 CALIBRATION STANDARD [AEROBE] 22-JAN-93 00:16:44 Area: 411248 % Named: 100
** GOOD PEAK MATCHING: PEAK POSITION MATCHING ERROR (RMS) IS 0.0022. **
TSBA [Rev 3.60] MIDI Calibration Mix 1 . . . . . 0.998

CALIB. 1 CALIBRATION STANDARD [AEROBE] 22-JAN-93 00:46:57 Area: 405680 % Named: 100
** GOOD PEAK MATCHING: PEAK POSITION MATCHING ERROR (RMS) IS 0.0012. **
TSBA [Rev 3.60] MIDI Calibration Mix 1 . . . . . 0.996

18 1185-2 [AEROBE] 22-JAN-93 10:23:34 Area: 113272 % Named: 100
TSBA [Rev 3.60] Acinetobacter 0.244
A. haemolyticus 0.244

Microbe Inotech Laboratories, Inc.

DATA:F93122446 25-JAN-93 10:08:00

ID: 1 CALIBRATION STANDARD Date of run: 22-JAN-93 06:51:26
Bottle: 1 CALIBRATION [AEROBE]

RT	Area	Ar/Ht	Respon	ECL	Name	%	Comment 1	Comment 2
1.671	147449984	0.026	. . .	7.045	SOLVENT PEAK	. . .	< min rt	
1.777	1224	0.027	. . .	7.253	. . . . .	. . .	< min rt	
2.666	17656	0.025	1.266	9.000	9:0	5.05		
3.175	37792	0.026	1.202	10.000	10:0	10.27	Peak match 0.0003	
3.875	19664	0.029	1.145	11.000	11:0	5.09	Peak match -0.0019	
4.018	7832	0.030	1.137	11.155	10:0 2OH	2.01	Peak match 0.0026	
4.263	4040	0.032	1.123	11.420	10:0 3OH	1.03	Peak match 0.0014	
4.798	41768	0.032	1.095	12.000	12:0	10.34	Peak match -0.0007	
5.954	21328	0.036	1.051	13.000	13:0	5.06	Peak match -0.0001	
7.324	44560	0.039	1.012	14.000	14:0	10.19	Peak match 0.0002	
8.865	22576	0.042	0.978	15.000	15:0	4.99	Peak match -0.0015	
9.202	9672	0.044	0.972	15.203	14:0 2OH	2.12	Peak match 0.0023	
9.675	4808	0.045	0.963	15.488	Sum In Feature 3 . .	1.05	Peak match 0.0010	14:0 3OH/16:1 ISO I
10.525	47408	0.044	0.948	16.000	16:0	10.16	Peak match -0.0005	
12.255	24280	0.046	0.922	17.000	17:0	5.06	Peak match -0.0006	
12.666	10136	0.049	0.916	17.234	16:0 2OH	2.10	Peak match 0.0007	
14.009	50640	0.049	0.898	18.000	18:0	10.28	Peak match 0.0002	
15.757	26616	0.051	0.877	19.000	19:0	5.28	Peak match -0.0003	
17.482	51256	0.051	0.857	20.000	20:0	9.93		
*******	4808	. . .	. . .	. . .	SUMMED FEATURE 3 . .	1.05	12:0 ALDE ?	unknown 10.928
*******	. . . . .	. . .	. . .	. . .	. . . . .	. . .	16:1 ISO I/14:0 3OH	14:0 3OH/16:1 ISO I

Solvent Ar	Total Area	Named Area	% Named	Total Amnt	Nbr Ref	ECL Deviation	Ref ECL Shift
147449984	442032	442032	100.00	442524	0	. . . . .	. . . . .

GOOD PEAK MATCHING: PEAK POSITION MATCHING ERROR (RMS) IS 0.0012.

TSBA [Rev 3.60] MIDI Calibration Mix 1 . . . . . 0.990

Comparison with TSBA [Rev 3.60]: MIDI Calibration Mix 1 Distance: 0.453

```
                  0   5  10  15  20  25  30  35  40  45  50  55  60  65  70  75  80  85  90  95 100
                  .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
9:0 . . . . . .   .   *   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
10:0. . . . . .   .   .   *   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
11:0. . . . . .   .   *   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
10:0 2OH. . . . .   *   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
10:0 3OH. . . . .   *   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
12:0. . . . . .   .   .   *   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
13:0. . . . . .   .   *   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
14:0. . . . . .   .   .   *   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
15:0. . . . . .   .   *   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
14:0 2OH. . . . .   *   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
16:0. . . . . .   .   .   *   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
17:0. . . . . .   .   *   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
16:0 2OH. . . . .   *   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
18:0. . . . . .   .   .   *   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
19:0. . . . . .   .   *   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
20:0. . . . . .   .   .   *   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
SUMMED FEATURE 3. .   *   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
```

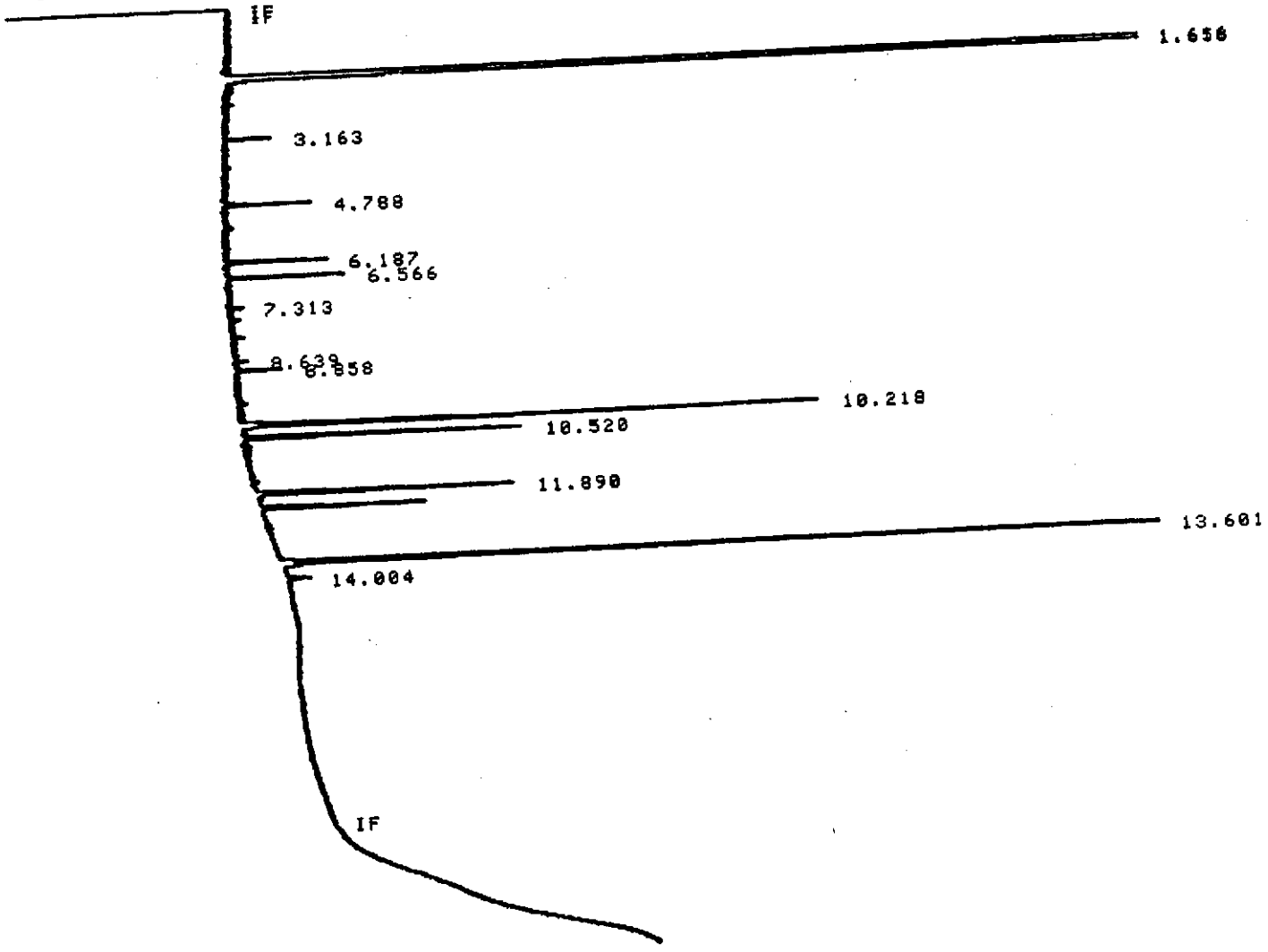
Microbe Inotech Laboratories, Inc.

BOTTLE: 18 ID#: 18FRI 22-JAN-93 22:43:50 FILE DATA:F93122446

1185-2

RUN # 21 JAN 22, 1993 10:23:34

START



STOP

RUN # 21 JAN 22, 1993 10:23:34

START-No plot

END OF SIGNAL

#

DATA:F93122446 25-JAN-93 10:08:00

ID: 18 1185-2 Date of run: 22-JAN-93 10:23:34
Bottle: 18 SAMPLE [AEROBE] Date edited: 25-JAN-93 10:05:49

RT	Area	Ar/Ht	Respon	ECL	Name	%	Comment 1	Comment 2
0.000	126458624	0.028	. . .	3.767	SOLVENT PEAK		< min rt	
3.174	1136	0.029	1.202	10.000	10:0	1.28	ECL deviates -0.000	Reference -0.002
4.798	2912	0.038	1.095	12.000	12:0	2.99	ECL deviates 0.000	Reference 0.000
6.197	3440	0.038	1.044	13.177	12:0 2OH	3.37	ECL deviates -0.001	
6.577	4144	0.039	1.033	13.454	12:0 3OH	4.02	ECL deviates -0.001	
8.868	1888	0.045	0.978	15.000	15:0	1.73	ECL deviates -0.000	Reference 0.002
10.158	760	0.038	0.955	15.777	16:1 w9c	0.68	ECL deviates 0.003	
10.227	23568	0.045	0.953	15.818	16:1 w7c	21.09	ECL deviates 0.001	
10.529	11368	0.045	0.948	16.000	16:0	10.12	ECL deviates 0.000	Reference 0.002
11.900	11624	0.049	0.927	16.792	17:1 wBc	10.12	ECL deviates 0.000	
12.259	7256	0.048	0.922	17.000	17:0	6.28	ECL deviates -0.000	Reference 0.002
13.611	43904	0.049	0.904	17.770	18:1 w9c	37.24	ECL deviates 0.001	
14.014	1272	0.055	0.898	18.000	18:0	1.07	ECL deviates 0.000	Reference 0.003

Solvent Ar	Total Area	Named Area	% Named	Total Amnt	Nbr Ref	ECL Deviation	Ref ECL Shift
126458624	113272	113272	100.00	106526	6	0.001	0.002

TSBA [Rev 3.60] Acinetobacter 0.244
A. haemolyticus 0.244

Comparison with TSBA [Rev 3.60]: Acinetobacter-haemolyticus Distance: 5.430

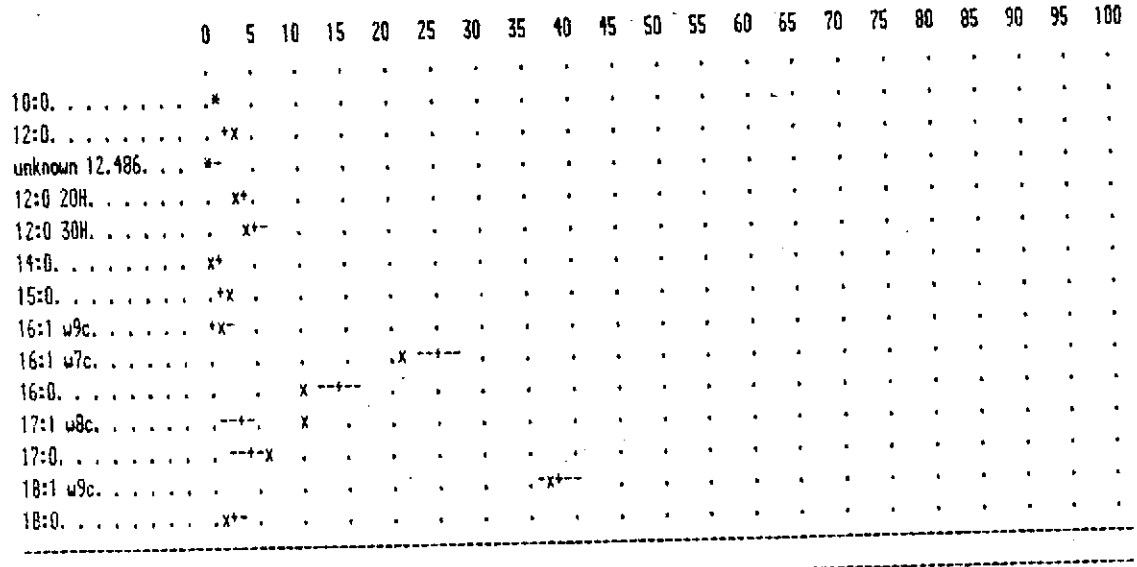
```
                    0   5   10  15  20  25  30  35  40  45  50  55  60  65  70  75  80  85  90  95  100
                    .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
10:0. . . . . +x  .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
12:0. . . . . .  x+-  .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
unknown 12.486. . . x+  .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
12:0 2OH. . . . . .  x+.   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
12:0 3OH. . . . . .  --x-+---.   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
15:0. . . . . +-x  .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
16:1 w9c. . . . . +x-  .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
16:1 w7c. . . . . .   .   .  ---+---x  .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
16:0. . . . . .   .   x   ---+----  .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
17:1 wBc. . . . . .---+---  x  .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
17:0. . . . . ---+--x  .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
18:1 w9c. . . . . .   .   .   .   .   .   .   . x---+---.   .   .   .   .   .   .   .   .   .   .   .
18:0. . . . . -+-  .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .   .
```

Microbe Inotech Laboratories, Inc.

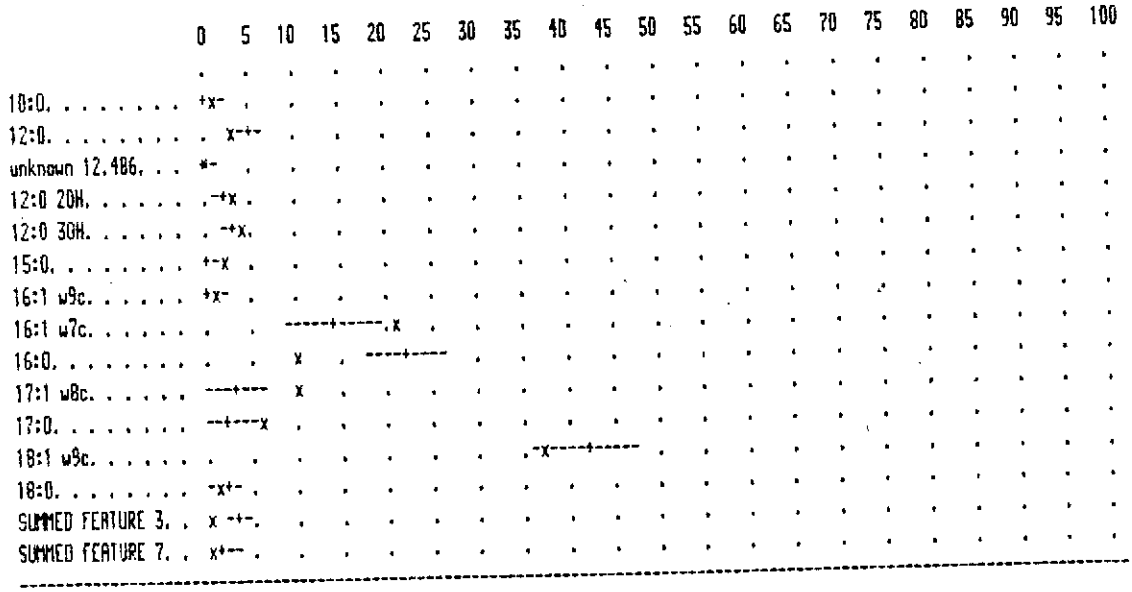
DATA:F93122446 25-JAN-93 10:08:00

Continue: 18 1185-2 [AEROBE] 22-JAN-93 10:23:34

Comparison with TSBA [Rev 3.60]: Acinetobacter-junii Distance: 7.008



Comparison with TSBA [Rev 3.60]: Acinetobacter-baumannii Distance: 7.246



Biolog MiDas
24 Hr Time Point

MICROLOG (TM) 2, RELEASE 3.00

Date : 24/01/93
Hour : 24
Plate Type : GN
Plate # : 1
Strain Name : 1185-2
Strain # : ETS, W.LOO
Other Info : CHIC
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	20	14	28	<620>	<434>	4	23	14	0	-18	-14
B	-9	-6	8	-2	3	-9	-11	10	5	-2	-10	-10
C	-4	6	10	5	-8	0	1	-9	1	1	<959>	<802>
D	<652>	<143>	-1	<493>	1	-4	<494>	5	-3	<526>	<933>	<314>
E	<181>	<115>	<481>	(50)	<325>	<999>	4	<883>	2	8	<829>	<999>
F	<900>	<933>	-4	(96+	<207>	<195>	<236>	<999>	<999>	<999>	11	<167>
G	<212>	3	<431>	1	<130>	<537>	<999>	17	(35)	<374>	-9	-5
H	<856>	<779>	4	0	-16	-5	-7	16	0	24	-1	-13

BIO-NUMBER : 0300-0000-0003-6447-7323-6775-5344-6000

SPECIES IDENTIFICATION : ALCALIGENES FAECALIS TYPE II

X	CLOSEST SPECIES :	SIM	DIST	AVG	MA
=> 94	1) ALCALIGENES FAECALIS TYPE II	0.795	1.914	1.938	5.0
63	2) COMAMONAS ACIDOVORANS	0.047	2.870	2.250	6.8
81	3) COMAMONAS TESTOSTERONI	0.003	3.724	1.688	5.1
25	4) ALCALIGENES DENITRIFICANS/PIECHAUDII	0.003	3.818	0.857	3.8
44	5) CDC GROUP IVC-2	0.001	4.338	0.101	1.6
44	6) ALCALIGENES EUTROPHUS	0.000	6.490	0.075	1.6
31	7) ALCALIGENES XYLOSOXYDANS SS XYLOSOXYDANS	0.000	6.519	0.604	3.3
31	8) ALCALIGENES FAECALIS SS FAECALIS	0.000	6.620	0.388	2.9
44	9) COMAMONAS TERRIGENA	0.000	6.830	1.938	8.3
50	10) ACINETOBACTER SPECIES GROUP B3	0.000	7.115	0.234	4.6
--	other :	-----	-----	-----	---

Microbe Inotech Laboratories, Inc.

MICROLOG GN DATA BASE Release 3.00

ABBREVIATED NAME : ALC.FAE TYPE II
FULL NAME : ALCALIGENES FAECALIS TYPE II
DATA BASE CATEGORY : CLINICAL

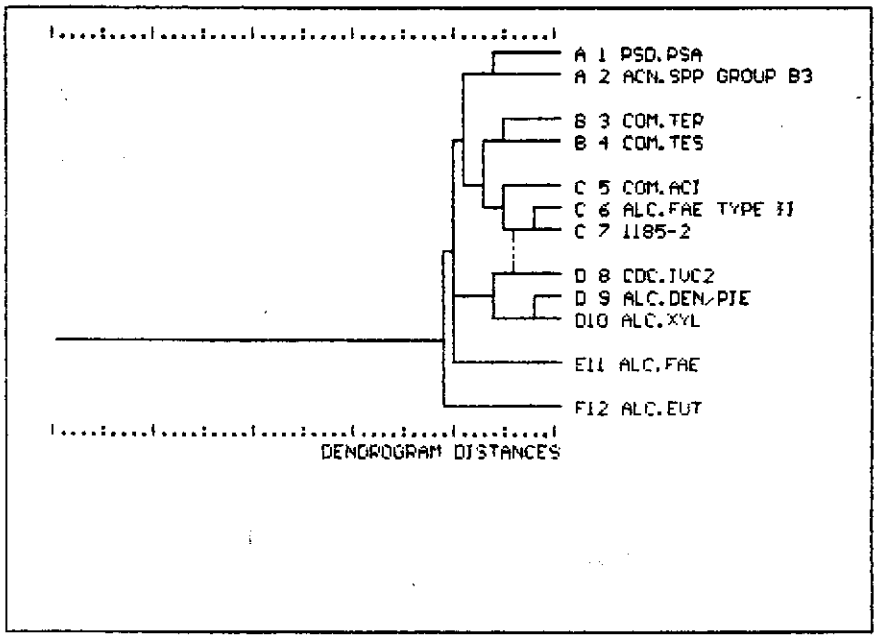
4 HOUR DATA :

	1	2	3	4	5	6	7	8	9	10	11	12
A	0	16	16	52	52	52	0	8	0	0	0	0
B	20	0	0	0	0	0	0	0	0	0	0	0
C	0	16	8	0	8	0	0	0	0	0	76	76
D	92	44	28	60	0	8	28	8	16	76	100	0
E	52	28	92	76	64	100	28	80	24	0	40	92
F	92	92	16	48	84	76	16	92	84	100	12	40
G	36	16	84	44	88	88	56	44	60	24	0	28
H	52	36	12	0	24	12	0	12	8	0	0	0

24 HOUR DATA :

	1	2	3	4	5	6	7	8	9	10	11	12
A	0	0	20	16	88	88	0	0	0	0	0	0
B	0	0	0	0	0	0	0	0	0	0	0	0
C	0	0	0	0	0	0	0	0	0	0	100	100
D	100	88	52	64	0	20	44	0	20	100	100	24
E	80	56	100	68	100	100	20	100	36	0	44	100
F	100	100	20	100	100	100	32	100	92	100	0	16
G	60	0	92	40	100	100	60	68	80	72	0	40
H	64	32	8	0	36	8	0	0	40	8	0	0

CLOSEST SPECIES :
1) 4.115 : ALCALIGENES FAECALIS SS FAECALIS
2) 4.927 : BORDETELLA BRONCHISEPTICA
3) 5.161 : AQUASPIRILLUM PUTRIDICONCHYLIUM
4) 5.247 : ACINETOBACTER SPECIES GROUP B3
5) 5.450 : ALCALIGENES DENITRIFICANS/PIECHAUDII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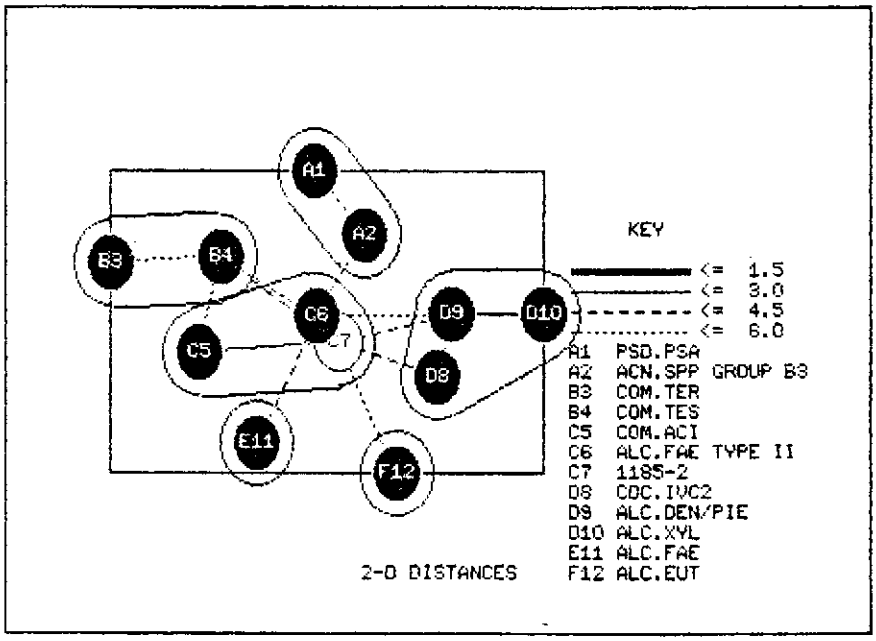
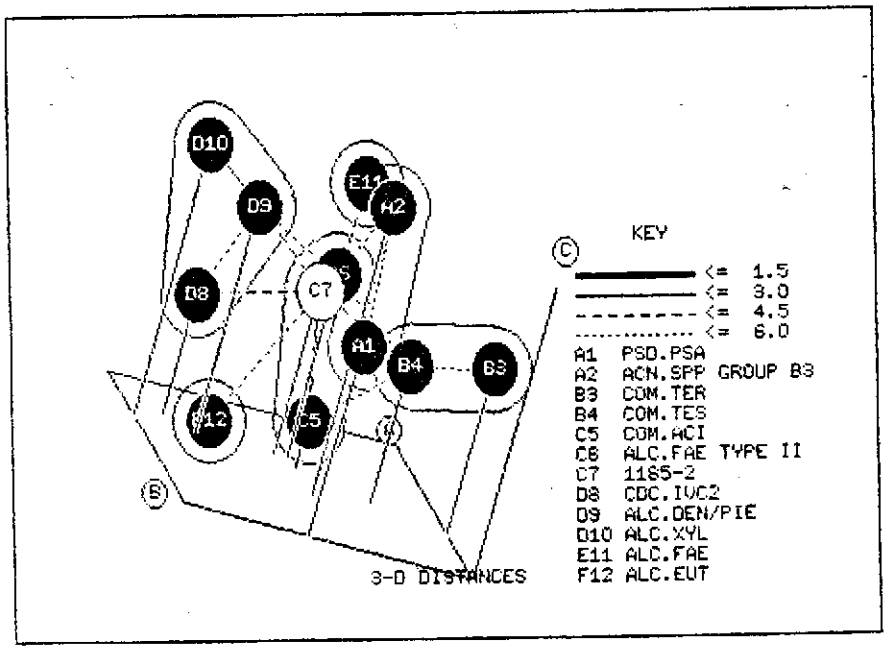
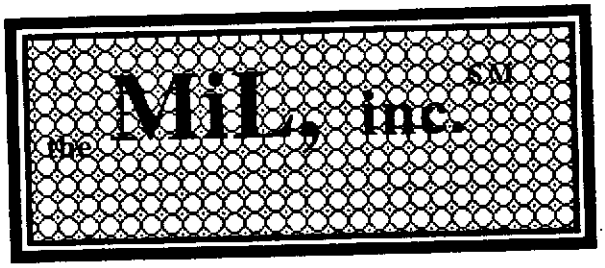
A 2 ACN.SPP GROUP B3
B 3 COM.TER
B 4 COM.TES
C 5 COM.ACI
C 6 ALC.FAE TYPE II
C 7 1185-2
D 8 CDC.IVC2
D 9 ALC.DEN/PIE
D10 ALC.XYL
E11 ALC.FAE
F12 ALC.EUT
DENDROGRAM DISTANCES


A1
A2
B3
B4
C6
C7
C5
D9
D10
D8
E11
F12
KEY
<= 1.5
<= 3.0
<= 4.5
<= 6.0
A1 PSD.PSA
A2 ACN.SPP GROUP B3
B3 COM.TER
B4 COM.TES
C5 COM.ACI
C6 ALC.FAE TYPE II
C7 1185-2
D8 CDC.IVC2
D9 ALC.DEN/PIE
D10 ALC.XYL
E11 ALC.FAE
F12 ALC.EUT
2-D DISTANCES


D10
D9
E11
A2
D8
C7
A1
B4
B3
F12
C5
KEY
<= 1.5
<= 3.0
<= 4.5
<= 6.0
A1 PSD.PSA
A2 ACN.SPP GROUP B3
B3 COM.TER
B4 COM.TES
C5 COM.ACI
C6 ALC.FAE TYPE II
C7 1185-2
D8 CDC.IVC2
D9 ALC.DEN/PIE
D10 ALC.XYL
E11 ALC.FAE
F12 ALC.EUT
3-D DISTANCES



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(800) 688-9144
FAX: (314) 878-9376
E-mail: Bruce C. Hemming
76177.204@compuserve.com

Custom Microbial Services

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—1125-C

PO Number none

January 6, 1992

Summary Report of Analysis
[No. 1125-C Page 1 of1]

January 6,1992

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

Sample Description:
Thu, Oct 22, 1992 - 1:33 PM: Received sample by U.S. Postal express. Sample included 3x40 ml vials to be treated as one sample. Request TPC, GC-FAME, and Biolog™. Also total nitrogen as NH3, and NO3. Co-metabolic growth study was discussed in December between Walter Loo and Dr. Hemming and implemented with advanced plate design using 95 carbon sources.
Information on the vials:
Firm name: Croley And Herring Investment CO. (CHIC)
Project site: 5800 Christe-Emery
Sample ID:EW-1
Date 10/19/92

Chain of Custody Record Information -
MiL, Inc. REPORT & Invoice No.: MILB-1125-C Purchase Order —none

Processing:

The strain was individually streaked out onto Trypticase Soybroth Agar [TSBA]. After 24 hours incubation the strain was suspended in sterile saline for use in the 96 well, microtiter plates. Two replicates of each plate were prepared, one set with TCE, and the other without. The plates were then incubated for 24 hours. After their incubation period the optical densities of the wells were read, the averages of the replicate wells were calculated, and the results charted on the following pages.

Observations:
Of the 95 carbon substrates tested, 57 were stimulatory, while 38 were inhibitory. Hydrolysis of the surfactants Tween 40, and Tween 80 was greatly inhibited by TCE. One might speculate these surfactants enabled penetration and lysis of bacterial membrane by TCE.

Sugars and their derivatives were generally stimulatory substrates, whereas with the utilization of organic acids, bacterial growth was inhibited in the presence of TCE. Most amino acids were found to have a similar inhibitory effect on bacterial growth in the presence of TCE as the organic acids (See table of tests).

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

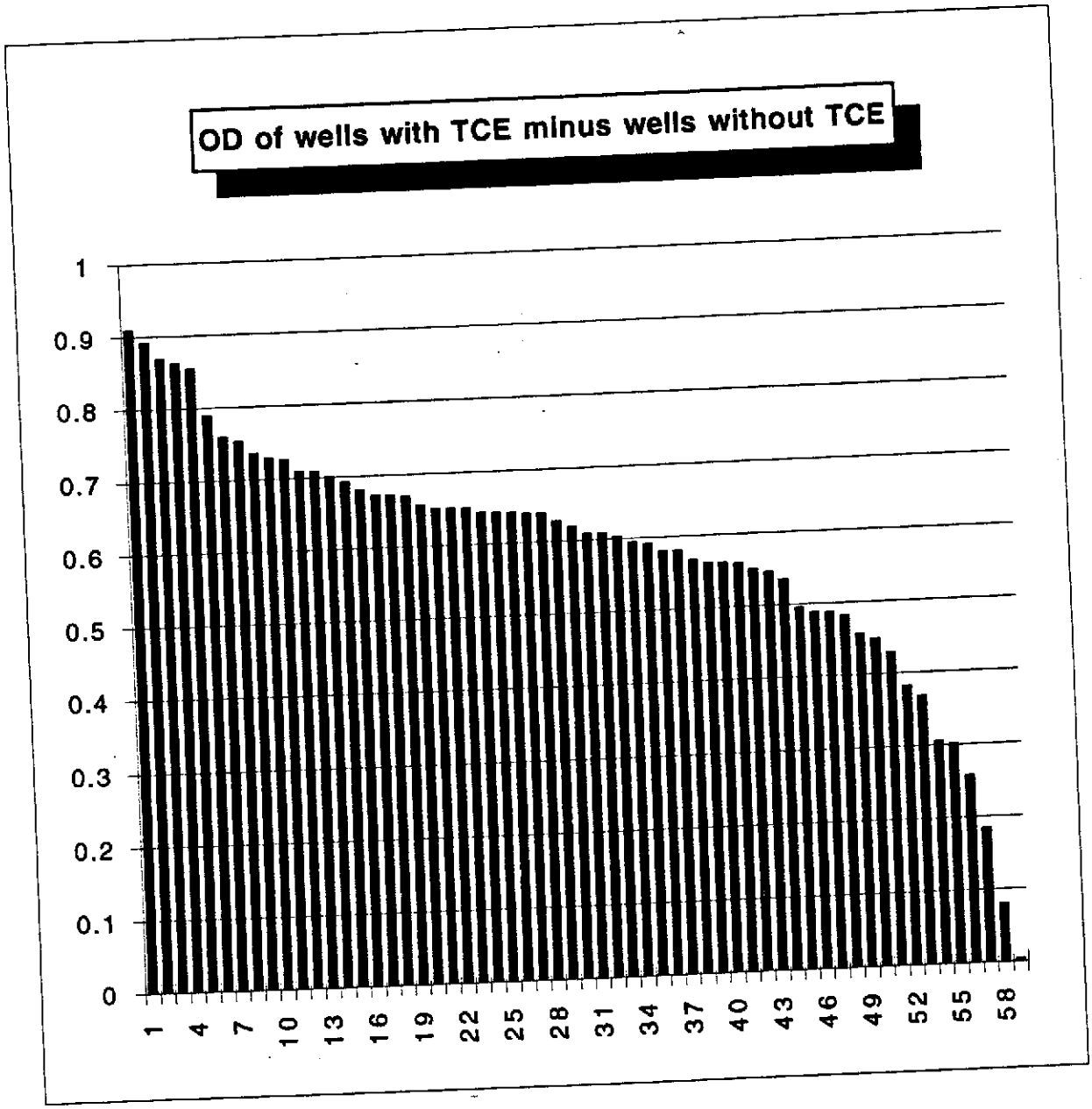
Thank you from the Staff on project:

Dr. Bruce C. Hemming - Operations Director

Ms. Julie K. Kidney - Asst. Lab Manager

Microbe Inotech Laboratories, Inc.

With TCE #1	With TCE #2	Ave With TCE		W/O TCE #1	W/O TCE #2	Ave W/O TCE	With - W/O TCE		Carbon source
1.607	1.544	1.5755		0.57	0.761	0.6655	0.91		Uridine
1.604	1.531	1.5675		0.661	0.689	0.675	0.8925	L-	Ornithine
1.611	1.614	1.6125		0.637	0.849	0.743	0.8695	2,3-	Butanediol
1.163	1.425	1.294		0.117	0.746	0.4315	0.8625		Turinose
1.367	1.696	1.5315		0.612	0.742	0.677	0.8545		Glucose-1-phosphate
1.161	1.544	1.3525		0.466	0.66	0.563	0.7895	D-	Fructose
1.151	1.627	1.389		0.54	0.719	0.6295	0.7595	a-	D-Lactose
1.152	1.623	1.3875		0.556	0.713	0.6345	0.753		Cellobiose
1.246	1.556	1.401		0.597	0.733	0.665	0.736		Hydroxy-L-proline
1.34	1.33	1.335		0.548	0.665	0.6065	0.7285		Glucuronamide
1.106	1.549	1.3275		0.549	0.654	0.6015	0.726	D-	Saccharic acid
1.095	1.463	1.279		0.527	0.611	0.569	0.71	L-	Arabinose
1.21	1.331	1.2705		0.552	0.573	0.5625	0.708		Maltose
1.364	1.364	1.364		0.637	0.689	0.663	0.701		Quinic acid
1.133	1.499	1.316		0.546	0.701	0.6235	0.6925		Gentiobiose
1.246	1.458	1.352		0.607	0.734	0.6705	0.6815		Glycogen
1.163	1.471	1.317		0.587	0.7	0.6435	0.6735	D,L	Carnitine
1.285	1.612	1.4485		0.619	0.932	0.7755	0.673	D-	Glucuronic acid
1.171	1.423	1.297		0.538	0.715	0.6265	0.6705	L-	Fucose
1.179	1.403	1.291		0.55	0.718	0.634	0.657		Lactulose
1.191	1.399	1.295		0.586	0.7	0.643	0.652	D-	Trehalose
0.968	1.527	1.2475		0.532	0.66	0.596	0.6515		Phenylethylamine
1.118	1.601	1.3595		0.605	0.812	0.7085	0.651	a-	Cyclodextrin
1.121	1.444	1.2825		0.558	0.718	0.638	0.6445	D-	Mannose
1.072	1.325	1.1985		0.476	0.634	0.555	0.6435	a-	D-Glucose
1.116	1.494	1.305		0.592	0.732	0.662	0.643	D-	Raffinose
1.17	1.333	1.2515		0.567	0.654	0.6105	0.641	D-	Mannitol
1.218	1.299	1.2585		0.552	0.685	0.6185	0.64		Xylitol
1.3	1.149	1.2245		0.464	0.727	0.5955	0.629	i-	Erythritol
0.983	1.434	1.2085		0.524	0.653	0.5885	0.62	L-	Rhamnose
1.033	1.42	1.2265		0.564	0.669	0.6165	0.61	D-	Arabitol
1.112	1.386	1.249		0.578	0.701	0.6395	0.6095	n-	Acetyl-D-Glucosamine
1.106	1.413	1.2595		0.587	0.724	0.6555	0.604		Glucose-6-phosphate
1.309	1.299	1.304		0.58	0.837	0.7085	0.5955	D-	Galacturonic acid
1.048	1.379	1.2135		0.603	0.639	0.621	0.5925	n-	Adonitol
1.062	1.413	1.2375		0.58	0.731	0.6555	0.582		Sucrose
1.011	1.329	1.17		0.537	0.64	0.5885	0.5815	n-	Acetyl-D-Galactosamine
1.077	1.278	1.1775		0.564	0.656	0.61	0.5675	B-	Methyl-D-Glucoside
1.019	1.367	1.193		0.574	0.687	0.6305	0.5625	g-	Aminobutyric acid
1.017	1.373	1.195		0.587	0.678	0.6325	0.5625	D-	Galactose
1.077	1.401	1.239		0.627	0.73	0.6785	0.5605		Malonic acid
1.25	1.359	1.3045		0.589	0.916	0.7525	0.552	D-	Glucosaminic acid
1.058	1.285	1.1715		0.546	0.705	0.6255	0.546	D-	Sorbitol
1.191	1.526	1.3585		0.739	0.907	0.823	0.5355		Glycyl-L-Aspartic acid
0.969	1.406	1.1875		0.552	0.83	0.691	0.4965	D-	Galactonic acid lactone
0.948	1.376	1.162		0.576	0.771	0.6735	0.4885		Glycerol
1.316	0.961	1.1385		0.618	0.684	0.651	0.4875		Dextrin
0.852	1.499	1.1755		0.587	0.799	0.693	0.4825	D-	Psicose
1.079	1.577	1.328		0.778	0.965	0.8715	0.4565	D,L	alpha-Glycerolphosphate
1.054	1.145	1.0995		0.608	0.692	0.65	0.4495		Thymidine
0.73	1.336	1.033		0.563	0.645	0.604	0.429	2-	Aminoethanol
0.784	1.247	1.0155		0.548	0.717	0.6325	0.383		Water
0.605	1.301	0.953		0.546	0.624	0.585	0.368	m-	inositol
0.997	0.922	0.9595		0.586	0.721	0.6535	0.306		Putrescine
0.684	1.256	0.97		0.548	0.788	0.668	0.302	D-	Melibiose
1.428	1.393	1.4105		0.059	2.246	1.1525	0.258	a-	Glutaric acid
1.121	1.601	1.361		0.602	1.751	1.1765	0.1845		Citric acid
1.269	1.518	1.3935		1.186	1.439	1.3125	0.081	D-	Serine
1.09	1.432	1.261		0.967	1.546	1.2565	0.0045		Itaconic acid


OD of wells with TCE minus wells without TCE
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
1
4
7
10
13
16
19
22
25
28
31
34
37
40
43
46
49
52
55
58

Microbe Inotech Laboratories, Inc.

Raw data

DATA FILE: DATA0101.002
DESCRIPTION: ETS 1125 CometabolicEndpt with TCE rep#1 Fri Jan 01 1993 12:06 pm
PROTOCOL:
MODE: endpoint AUTOMIX: OFF CALIBRATION: ON
WAVELENGTH: 590

OD with Plate Blank Subtracted

	1	2	3	4	5	6	7	8	9	10	11	12
A	0.784	1.118	1.316	1.246	1.174	0.611	1.011	1.112	1.048	1.095	1.033	1.152
B	1.300	1.161	1.171	1.017	1.133	1.072	0.606	1.151	1.173	1.210	1.170	1.121
C	0.664	1.077	0.852	1.116	0.983	1.058	1.062	1.191	1.163	1.216	0.879	1.334
D	1.278	1.026	1.121	1.374	0.969	1.309	1.207	1.250	1.285	1.161	1.318	1.123
E	0.862	1.090	0.765	1.426	0.901	1.274	1.077	1.348	1.364	1.106	0.858	1.419
F	1.025	1.648	1.340	1.222	0.665	1.196	1.192	1.180	1.207	1.347	1.151	1.148
G	1.177	1.264	1.127	1.604	1.255	1.218	1.116	1.269	1.199	1.189	1.163	1.019
H	0.746	1.040	1.607	1.054	0.968	0.937	0.730	1.611	0.948	1.079	1.367	1.106

Microbe Inotech Laboratories, Inc.

Report of Raw data
(Plate Blank Subtracted)

DATA FILE: DATA0101.00Z
DESCRIPTION: ETS 1125 CometabolicEndpt with TCE rep#1
PROTOCOL:
MODE: endpoint AUTOMIX: OFF
WAVELENGTH: 590

Fri Jan 01 1993
12:07 pm
CALIBRATION: ON

UNKNOWNS	Mean OD	Std Dev	CV	Well	OD
A01	0.784	*****	*****	A1	0.784
A02	1.118	*****	*****	A2	1.118
A03	1.316	*****	*****	A3	1.316
A04	1.246	*****	*****	A4	1.246
A05	1.174	*****	*****	A5	1.174
A06	0.811	*****	*****	A6	0.811
A07	1.011	*****	*****	A7	1.011
A08	1.112	*****	*****	A8	1.112
A09	1.048	*****	*****	A9	1.048
A10	1.095	*****	*****	A10	1.095
A11	1.033	*****	*****	A11	1.033
A12	1.152	*****	*****	A12	1.152
B01	1.300	*****	*****	B1	1.300
B02	1.161	*****	*****	B2	1.161
B03	1.171	*****	*****	B3	1.171
B04	1.017	*****	*****	B4	1.017
B05	1.133	*****	*****	B5	1.133
B06	1.072	*****	*****	B6	1.072
B07	0.606	*****	*****	B7	0.606
B08	1.151	*****	*****	B8	1.151
B09	1.179	*****	*****	B9	1.179
B10	1.210	*****	*****	B10	1.210

Microbe Inotech Laboratories, Inc.

Report of Raw data
(Plate Blank Subtracted)

DATA FILE: DATA0101.002 PAGE: 2
DESCRIPTION: ETS 1125 CometabolicEndpt with TCE rep#1 Fri Jan 01 1993
PROTOCOL: 12:07 pm
MODE: endpoint AUTOMIX: OFF
WAVELENGTH: 590 CALIBRATION: ON

UNKNOWNS	Mean OD	Std Dev	CV	Well	OD
B11	1.170	*****	*****	B11	1.170
B12	1.121	*****	*****	B12	1.121
C01	0.684	*****	*****	C1	0.684
C02	1.077	*****	*****	C2	1.077
C03	0.852	*****	*****	C3	0.852
C04	1.116	*****	*****	C4	1.116
C05	0.983	*****	*****	C5	0.983
C06	1.058	*****	*****	C6	1.058
C07	1.062	*****	*****	C7	1.062
C08	1.191	*****	*****	C8	1.191
C09	1.163	*****	*****	C9	1.163
C10	1.218	*****	*****	C10	1.218
C11	0.879	*****	*****	C11	0.879
C12	1.334	*****	*****	C12	1.334
D01	1.278	*****	*****	D1	1.278
D02	1.026	*****	*****	D2	1.026
D03	1.121	*****	*****	D3	1.121
D04	1.374	*****	*****	D4	1.374
D05	0.969	*****	*****	D5	0.969
D06	1.309	*****	*****	D6	1.309
D07	1.207	*****	*****	D7	1.207
D08	1.250	*****	*****	D8	1.250

Microbe Inotech Laboratories, Inc.

Report of Raw data
(Plate Blank Subtracted)

DATA FILE: DATA0101.002 PAGE: 3
DESCRIPTION: ETS 1125 CometabolicEndpt with TCE rep#1 Fri Jan 01 1993
PROTOCOL: 12:07 pm
MODE: endpoint AUTOMIX: OFF
WAVELENGTH: 590 CALIBRATION: ON

UNKNOWNS	Mean OD	Std Dev	CV	Well	OD
D09	1.285	*****	*****	D9	1.285
D10	1.181	*****	*****	D10	1.181
D11	1.318	*****	*****	D11	1.318
D12	1.123	*****	*****	D12	1.123
E01	0.862	*****	*****	E1	0.862
E02	1.090	*****	*****	E2	1.090
E03	0.765	*****	*****	E3	0.765
E04	1.428	*****	*****	E4	1.428
E05	0.901	*****	*****	E5	0.901
E06	1.274	*****	*****	E6	1.274
E07	1.077	*****	*****	E7	1.077
E08	1.346	*****	*****	E8	1.346
E09	1.364	*****	*****	E9	1.364
E10	1.106	*****	*****	E10	1.106
E11	0.858	*****	*****	E11	0.858
E12	1.419	*****	*****	E12	1.419
F01	1.025	*****	*****	F1	1.025
F02	1.648	*****	*****	F2	1.648
F03	1.340	*****	*****	F3	1.340
F04	1.222	*****	*****	F4	1.222
F05	0.665	*****	*****	F5	0.665
F06	1.196	*****	*****	F6	1.196

Microbe Inotech Laboratories, Inc.

Report of Raw data
(Plate Blank Subtracted)

DATA FILE: DATA0101.002
DESCRIPTION: ETS 1125 CometabolicEndpt with TCE rep#1
PROTOCOL:
MODE: endpoint AUTOMIX: OFF
WAVELENGTH: 590

Fri Jan 01 1993
12:08 pm
CALIBRATION: ON

UNKNOWNS	Mean OD	Std Dev	CV	Well	OD
F07	1.192	*****	*****	F7	1.192
F08	1.180	*****	*****	F8	1.180
F09	1.207	*****	*****	F9	1.207
F10	1.347	*****	*****	F10	1.347
F11	1.191	*****	*****	F11	1.191
F12	1.148	*****	*****	F12	1.148
G01	1.177	*****	*****	G1	1.177
G02	1.264	*****	*****	G2	1.264
G03	1.127	*****	*****	G3	1.127
G04	1.604	*****	*****	G4	1.604
G05	1.255	*****	*****	G5	1.255
G06	1.218	*****	*****	G6	1.218
G07	1.116	*****	*****	G7	1.116
G08	1.269	*****	*****	G8	1.269
G09	1.199	*****	*****	G9	1.199
G10	1.189	*****	*****	G10	1.189
G11	1.163	*****	*****	G11	1.163
G12	1.019	*****	*****	G12	1.019
H01	0.746	*****	*****	H1	0.746
H02	1.040	*****	*****	H2	1.040
H03	1.607	*****	*****	H3	1.607
H04	1.054	*****	*****	H4	1.054

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Report of Raw data
(Plate Blank Subtracted)

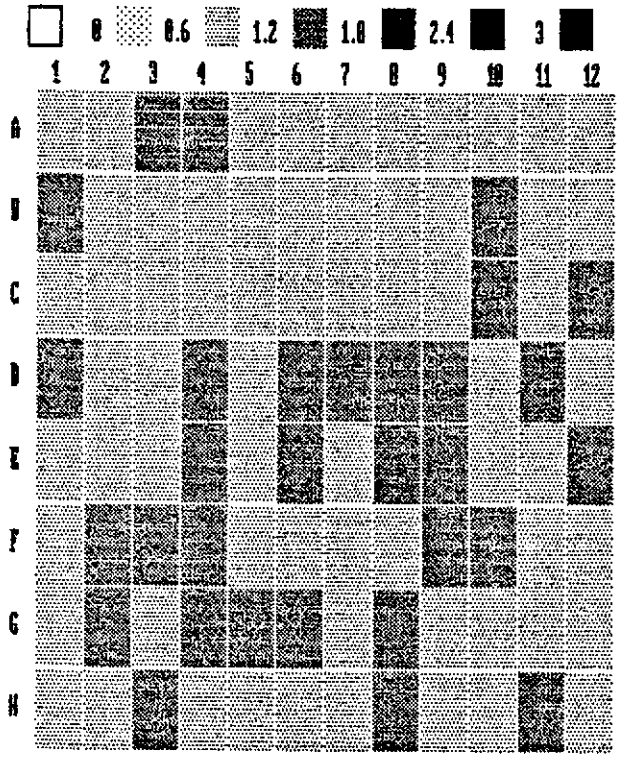
DATA FILE: DATA0101.002 PAGE: 5
DESCRIPTION: ETS 1125 CometabolicEndpt with TCE rep#1 Fri Jan 01 1993
PROTOCOL: 12:08 pm
MODE: endpoint AUTOMIX: OFF
WAVELENGTH: 590 CALIBRATION: ON

UNKNOWNS	Mean OD	Std Dev	CV	Well	OD
H05	0.968	*****	*****	H5	-0.968
H06	0.997	*****	*****	H6	0.997
H07	0.730	*****	*****	H7	0.730
H08	1.611	*****	*****	H8	1.611
H09	0.948	*****	*****	H9	0.948
H10	1.079	*****	*****	H10	1.079
H11	1.367	*****	*****	H11	1.367
H12	1.106	*****	*****	H12	1.106

Microbe Inotech Laboratories, Inc.

Grey scales

DATA FILE: DATA0101.00Z
DESCRIPTION: ETS 1125 CometabolicEndpt with TCE rep#1 Fri Jan 01 1993
PROTOCOL: 12:10 pm
MODE: endpoint AUTOMIX: OFF
WAVELENGTH: 590 CALIBRATION: ON



Raw data

DATA FILE: **DATA0101.003**
DESCRIPTION: ETS 1125 CometabolicEndpt with TCE rep#2 Fri Jan 01 1993
PROTOCOL: 12:13 pm
MODE: endpoint AUTOMIX: OFF
WAVELENGTH: 590 CALIBRATION: ON

OD with Plate Blank Subtracted

	1	2	3	4	5	6	7	8	9	10	11	12
A	1.247	1.601	0.961	1.458	1.395	0.817	1.329	1.386	1.379	1.463	1.420	1.623
B	1.149	1.544	1.432	1.373	1.449	1.325	1.301	1.627	1.403	1.331	1.333	1.444
C	1.265	1.278	1.499	1.494	1.434	1.285	1.413	1.399	1.425	1.299	1.119	1.648
D	1.888	1.577	1.601	1.403	1.406	1.299	1.438	1.359	1.612	1.173	1.497	1.619
E	0.819	1.432	0.881	1.393	0.843	1.477	1.401	1.506	1.364	1.549	1.238	1.616
F	1.361	1.780	1.330	1.356	1.153	1.292	1.427	1.480	1.354	1.269	1.526	1.596
G	1.464	1.556	1.525	1.531	1.551	1.169	1.374	1.518	1.685	1.652	1.471	1.367
H	0.993	1.433	1.544	1.145	1.527	0.922	1.336	1.614	1.376	1.577	1.696	1.413

Report of Raw data
(Plate Blank Subtracted)

DATA FILE: DATA0101.003 PAGE: 1
DESCRIPTION: ETS 1125 CometabolicEndpt with TCE rep#2 Fri Jan 01 1993
PROTOCOL: 12:14 pm
MODE: endpoint AUTOMIX: OFF
WAVELENGTH: 590 CALIBRATION: ON

UNKNOWNS	Mean OD	Std Dev	CV	Well	OD
A01	1.247	*****	*****	A1	1.247
A02	1.601	*****	*****	A2	1.601
A03	0.961	*****	*****	A3	0.961
A04	1.456	*****	*****	A4	1.456
A05	1.395	*****	*****	A5	1.395
A06	0.817	*****	*****	A6	0.817
A07	1.329	*****	*****	A7	1.329
A08	1.386	*****	*****	A8	1.386
A09	1.379	*****	*****	A9	1.379
A10	1.463	*****	*****	A10	1.463
A11	1.420	*****	*****	A11	1.420
A12	1.623	*****	*****	A12	1.623
B01	1.149	*****	*****	B1	1.149
B02	1.544	*****	*****	B2	1.544
B03	1.432	*****	*****	B3	1.432
B04	1.373	*****	*****	B4	1.373
B05	1.449	*****	*****	B5	1.449
B06	1.325	*****	*****	B6	1.325
B07	1.301	*****	*****	B7	1.301
B08	1.627	*****	*****	B8	1.627
B09	1.403	*****	*****	B9	1.403
B10	1.331	*****	*****	B10	1.331

Report of Raw data
(Plate Blank Subtracted)

DATA FILE: **DATA0101.003** PAGE: 2
DESCRIPTION: ET5 1125 CometabolicEndpt with TCE rep#2 Fri Jan 01 1993
PROTOCOL: 12:14 pm
MODE: endpoint AUTOMIX: OFF
WAVELENGTH: 590 CALIBRATION: ON

UNKNOWNS	Mean OD	Std Dev	CV	Well	OD
B11	1.333	*****	*****	B11	1.333
B12	1.444	*****	*****	B12	1.444
C01	1.265	*****	*****	C1	1.265
C02	1.278	*****	*****	C2	1.278
C03	1.499	*****	*****	C3	1.499
C04	1.494	*****	*****	C4	1.494
C05	1.434	*****	*****	C5	1.434
C06	1.285	*****	*****	C6	1.285
C07	1.413	*****	*****	C7	1.413
C08	1.399	*****	*****	C8	1.399
C09	1.425	*****	*****	C9	1.425
C10	1.299	*****	*****	C10	1.299
C11	1.119	*****	*****	C11	1.119
C12	1.648	*****	*****	C12	1.648
D01	1.888	*****	*****	D1	1.888
D02	1.577	*****	*****	D2	1.577
D03	1.601	*****	*****	D3	1.601
D04	1.403	*****	*****	D4	1.403
D05	1.406	*****	*****	D5	1.406
D06	1.299	*****	*****	D6	1.299
D07	1.438	*****	*****	D7	1.438
D08	1.359	*****	*****	D8	1.359

Report of Raw data
(Plate Blank Subtracted)

DATA FILE: DATA0101.003 PAGE: 3
DESCRIPTION: ETS 1125 CometabolicEndpt with TCE rep#2 Fri Jan 01 1993
PROTOCOL: 12:15 pm
MODE: endpoint AUTOMIX: OFF
WAVELENGTH: 590 CALIBRATION: ON

UNKNOWNS	Mean OD	Std Dev	CV	Well	OD
D09	1.612	*****	*****	D9	1.612
D10	1.173	*****	*****	D10	1.173
D11	1.497	*****	*****	D11	1.497
D12	1.619	*****	*****	D12	1.619
E01	0.819	*****	*****	E1	0.819
E02	1.432	*****	*****	E2	1.432
E03	0.881	*****	*****	E3	0.881
E04	1.393	*****	*****	E4	1.393
E05	0.843	*****	*****	E5	0.843
E06	1.477	*****	*****	E6	1.477
E07	1.401	*****	*****	E7	1.401
E08	1.506	*****	*****	E8	1.506
E09	1.364	*****	*****	E9	1.364
E10	1.549	*****	*****	E10	1.549
E11	1.238	*****	*****	E11	1.238
E12	1.616	*****	*****	E12	1.616
F01	1.361	*****	*****	F1	1.361
F02	1.780	*****	*****	F2	1.780
F03	1.330	*****	*****	F3	1.330
F04	1.356	*****	*****	F4	1.356
F05	1.153	*****	*****	F5	1.153
F06	1.292	*****	*****	F6	1.292

Report of Raw data
(Plate Blank Subtracted)

DATA FILE: DATA0101.003
DESCRIPTION: ETS 1125 CometabolicEndpt with TCE rep#2
PROTOCOL:
MODE: endpoint AUTOMIX: OFF
WAVELENGTH: 590

Fri Jan 01 1993
12:15 pm

CALIBRATION: ON

UNKNOWNS	Mean OD	Std Dev	CV	Well	OD
F07	1.427	*****	*****	F7	1.427
F08	1.480	*****	*****	F8	1.480
F09	1.354	*****	*****	F9	1.354
F10	1.269	*****	*****	F10	1.269
F11	1.526	*****	*****	F11	1.526
F12	1.596	*****	*****	F12	1.596
G01	1.464	*****	*****	G1	1.464
G02	1.556	*****	*****	G2	1.556
G03	1.525	*****	*****	G3	1.525
G04	1.531	*****	*****	G4	1.531
G05	1.551	*****	*****	G5	1.551
G06	1.169	*****	*****	G6	1.169
G07	1.374	*****	*****	G7	1.374
G08	1.518	*****	*****	G8	1.518
G09	1.685	*****	*****	G9	1.685
G10	1.652	*****	*****	G10	1.652
G11	1.471	*****	*****	G11	1.471
G12	1.367	*****	*****	G12	1.367
H01	0.993	*****	*****	H1	0.993
H02	1.433	*****	*****	H2	1.433
H03	1.544	*****	*****	H3	1.544
H04	1.145	*****	*****	H4	1.145

Report of Raw data
(Plate Blank Subtracted)

DATA FILE: DATA0101.003
DESCRIPTION: ETS 1125 CometabolicEndpt with TCE rep#2
PROTOCOL:
MODE: endpoint AUTOMIX: OFF
WAVELENGTH: 590

Fri Jan 01 1993
12:15 pm
CALIBRATION: ON

UNKNOWNS	Mean OD	Std Dev	CV	Well	OD
H05	1.527	*****	*****	H5	1.527
H06	0.922	*****	*****	H6	0.922
H07	1.336	*****	*****	H7	1.336
H08	1.614	*****	*****	H8	1.614
H09	1.376	*****	*****	H9	1.376
H10	1.577	*****	*****	H10	1.577
H11	1.696	*****	*****	H11	1.696
H12	1.413	*****	*****	H12	1.413

Microbe Inotech Laboratories, Inc.

Raw data

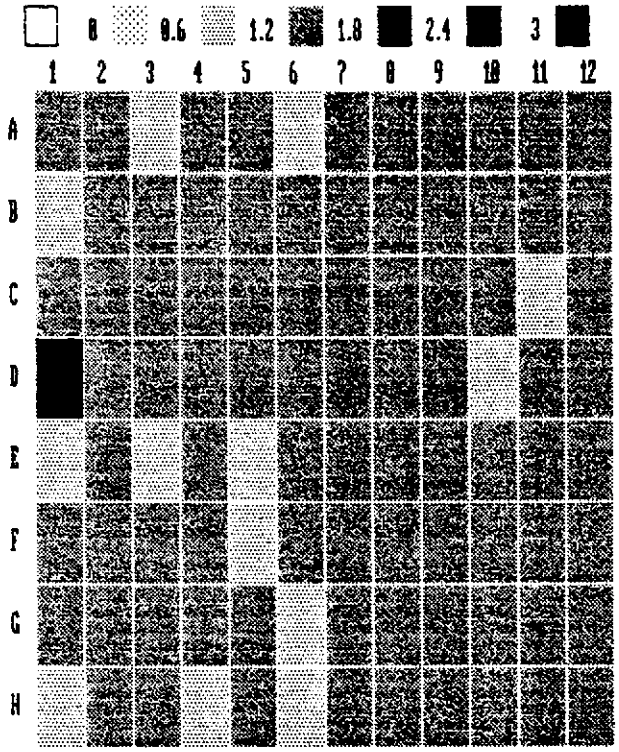
DATA FILE: DATA0101.004
DESCRIPTION: ETS 1125 CometabolicEndpt W/O TCE rep#1 Fri Jan 01 1993 12:19 pm
PROTOCOL:
MODE: endpoint AUTOMIX: OFF
WAVELENGTH: 590 CALIBRATION: ON

OD with Plate Blank Subtracted

	1	2	3	4	5	6	7	8	9	10	11	12
A	0.548	0.605	0.618	0.607	2.445	2.041	0.537	0.578	0.603	0.527	0.564	0.556
B	0.464	0.466	0.538	0.587	0.546	0.476	0.546	0.540	0.550	0.552	0.567	0.558
C	0.548	0.564	0.587	0.592	0.524	0.546	0.580	0.586	0.117	0.552	2.436	2.297
D	2.464	2.266	0.602	2.361	0.552	0.580	1.038	0.589	0.619	2.626	2.351	2.350
E	0.744	0.967	2.513	0.059	2.522	2.669	0.627	2.545	0.637	0.549	2.735	2.661
F	2.421	2.687	0.548	1.726	1.811	1.618	1.803	2.647	2.690	2.567	0.739	2.189
G	1.161	0.597	2.420	0.661	1.347	1.986	2.803	1.186	2.539	2.399	0.587	0.574
H	2.393	2.310	0.570	0.603	0.532	0.586	0.563	0.637	0.576	0.778	0.612	0.587

Grey scales

DATA FILE: DATA0101.003
DESCRIPTION: ETS 1125 CometabolicEndpt with TCE rep#2 Fri Jan 01 1993
PROTOCOL: 12:16 pm
MODE: endpoint AUTOMIX: OFF
WAVELENGTH: 590 CALIBRATION: ON



Report of Raw data
(Plate Blank Subtracted)

DATA FILE: **DATA0101.004**
DESCRIPTION: ETS 1125 CometabolicEndpt W/O TCE rep#1
PROTOCOL:
MODE: endpoint AUTOMIX: OFF
WAVELENGTH: 590

Fri Jan 01 1993
12:19 pm
CALIBRATION: ON

UNKNOWNS	Mean OD	Std Dev	CV	Well	OD
A01	0.548	*****	*****	A1	0.548
A02	0.605	*****	*****	A2	0.605
A03	0.618	*****	*****	A3	0.618
A04	0.607	*****	*****	A4	0.607
A05	2.445	*****	*****	A5	2.445
A06	2.041	*****	*****	A6	2.041
A07	0.537	*****	*****	A7	0.537
A08	0.578	*****	*****	A8	0.578
A09	0.603	*****	*****	A9	0.603
A10	0.527	*****	*****	A10	0.527
A11	0.564	*****	*****	A11	0.564
A12	0.556	*****	*****	A12	0.556
B01	0.464	*****	*****	B1	0.464
B02	0.466	*****	*****	B2	0.466
B03	0.538	*****	*****	B3	0.538
B04	0.587	*****	*****	B4	0.587
B05	0.546	*****	*****	B5	0.546
B06	0.476	*****	*****	B6	0.476
B07	0.546	*****	*****	B7	0.546
B08	0.540	*****	*****	B8	0.540
B09	0.550	*****	*****	B9	0.550
B10	0.552	*****	*****	B10	0.552

Report of Raw data
(Plate Blank Subtracted)

DATA FILE: DATA0101.004 PAGE: 2
DESCRIPTION: ETS 1125 CometabolicEndpt W/O TCE rep#1 Fri Jan 01 1993
PROTOCOL: 12:19 pm
MODE: endpoint AUTOMIX: OFF
WAVELENGTH: 590 CALIBRATION: ON

UNKNOWNS	Mean OD	Std Dev	CV	Well	OD
B11	0.567	*****	*****	B11	0.567
B12	0.558	*****	*****	B12	0.558
C01	0.548	*****	*****	C1	0.548
C02	0.564	*****	*****	C2	0.564
C03	0.587	*****	*****	C3	0.587
C04	0.592	*****	*****	C4	0.592
C05	0.524	*****	*****	C5	0.524
C06	0.546	*****	*****	C6	0.546
C07	0.580	*****	*****	C7	0.580
C08	0.586	*****	*****	C8	0.586
C09	0.117	*****	*****	C9	0.117
C10	0.552	*****	*****	C10	0.552
C11	2.436	*****	*****	C11	2.436
C12	2.297	*****	*****	C12	2.297
D01	2.464	*****	*****	D1	2.464
D02	2.266	*****	*****	D2	2.266
D03	0.602	*****	*****	D3	0.602
D04	2.361	*****	*****	D4	2.361
D05	0.552	*****	*****	D5	0.552
D06	0.580	*****	*****	D6	0.580
D07	1.038	*****	*****	D7	1.038
D08	0.589	*****	*****	D8	0.589

Report of Raw data
(Plate Blank Subtracted)

DATA FILE: DATA0101.004
DESCRIPTION: ETS 1125 CometabolicEndpt W/O TCE rep#1
PROTOCOL:
MODE: endpoint AUTOMIX: OFF
WAVELENGTH: 590

Fri Jan 01 1993
12:20 pm

CALIBRATION: ON

UNKNOWNS	Mean OD	Std Dev	CV	Well	OD
D09	0.619	*****	*****	D9	0.619
D10	2.626	*****	*****	D10	2.626
D11	2.351	*****	*****	D11	2.351
D12	2.350	*****	*****	D12	2.350
E01	0.744	*****	*****	E1	0.744
E02	0.967	*****	*****	E2	0.967
E03	2.513	*****	*****	E3	2.513
E04	0.059	*****	*****	E4	0.059
E05	2.522	*****	*****	E5	2.522
E06	2.669	*****	*****	E6	2.669
E07	0.627	*****	*****	E7	0.627
E08	2.545	*****	*****	E8	2.545
E09	0.637	*****	*****	E9	0.637
E10	0.549	*****	*****	E10	0.549
E11	2.735	*****	*****	E11	2.735
E12	2.661	*****	*****	E12	2.661
F01	2.421	*****	*****	F1	2.421
F02	2.687	*****	*****	F2	2.687
F03	0.548	*****	*****	F3	0.548
F04	1.726	*****	*****	F4	1.726
F05	1.811	*****	*****	F5	1.811
F06	1.618	*****	*****	F6	1.618

Report of Raw data
(Plate Blank Subtracted)

DATA FILE: DATA0101.004
DESCRIPTION: ETS 1125 CometabolicEndpt W/O TCE rep#1
PROTOCOL:
MODE: endpoint AUTOMIX: OFF
WAVELENGTH: 590

Fri Jan 01 1993
12:20 pm

CALIBRATION: ON

UNKNOWNS	Mean OD	Std Dev	CV	Well	OD
F07	1.803	*****	*****	F7	1.803
F08	2.647	*****	*****	F8	2.647
F09	2.690	*****	*****	F9	2.690
F10	2.567	*****	*****	F10	2.567
F11	0.739	*****	*****	F11	0.739
F12	2.189	*****	*****	F12	2.189
G01	1.161	*****	*****	G1	1.161
G02	0.597	*****	*****	G2	0.597
G03	2.420	*****	*****	G3	2.420
G04	0.661	*****	*****	G4	0.661
G05	1.347	*****	*****	G5	1.347
G06	1.986	*****	*****	G6	1.986
G07	2.803	*****	*****	G7	2.803
G08	1.186	*****	*****	G8	1.186
G09	2.539	*****	*****	G9	2.539
G10	2.399	*****	*****	G10	2.399
G11	0.587	*****	*****	G11	0.587
G12	0.574	*****	*****	G12	0.574
H01	2.393	*****	*****	H1	2.393
H02	2.310	*****	*****	H2	2.310
H03	0.570	*****	*****	H3	0.570
H04	0.608	*****	*****	H4	0.608

Report of Raw data
(Plate Blank Subtracted)

DATA FILE: DATA0101.004
DESCRIPTION: ETS 1125 CometabolicEndpt W/O TCE rep#1
PROTOCOL:
MODE: endpoint AUTOMIX: OFF
WAVELENGTH: 590

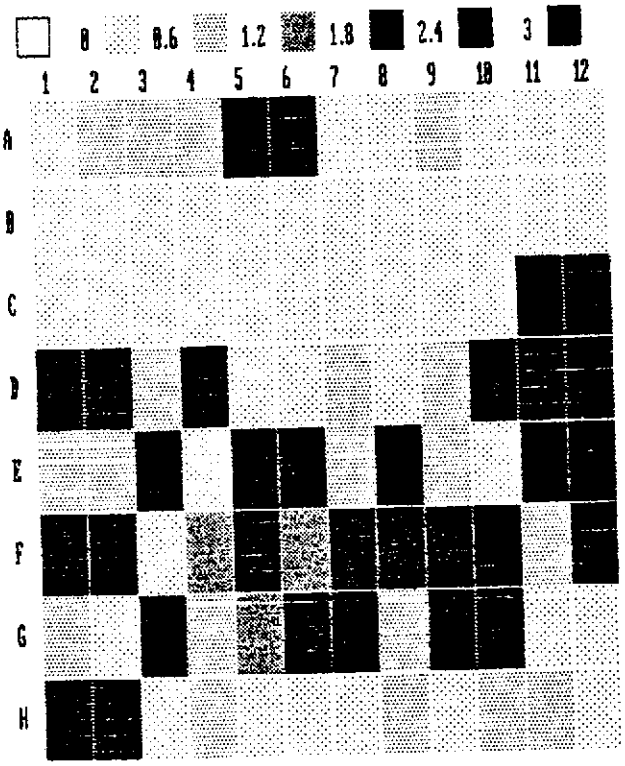
Fri Jan 01 1993
12:21 pm

CALIBRATION: ON

UNKNOWNS	Mean OD	Std Dev	CV	Well	OD
H05	0.532	*****	*****	H5	0.532
H06	0.586	*****	*****	H6	0.586
H07	0.563	*****	*****	H7	0.563
H08	0.637	*****	*****	H8	0.637
H09	0.576	*****	*****	H9	0.576
H10	0.778	*****	*****	H10	0.778
H11	0.612	*****	*****	H11	0.612
H12	0.587	*****	*****	H12	0.587

Grey scales

DATA FILE: DATA0101.004
DESCRIPTION: ETS 1125 CometabolicEndpt W/O TCE rep#1 Fri Jan 01 1993 12:22 pm
PROTOCOL:
MODE: endpoint AUTOMIX: OFF CALIBRATION: ON
WAVELENGTH: 590



Raw data

DATA FILE: DATA0101.005
DESCRIPTION: ETS 1125 CometabolicEndpt W/O TCE rep#2 Fri Jan 01 1993 12:25 pm
PROTOCOL:
MODE: endpoint AUTOMIX: OFF
WAVELENGTH: 590 CALIBRATION: ON

OD with Plate Blank Subtracted

	1	2	3	4	5	6	7	8	9	10	11	12
A	0.717	0.812	0.684	0.734	2.441	2.196	0.640	0.701	0.693	0.611	0.669	0.713
B	0.727	0.660	0.715	0.678	0.701	0.634	0.624	0.719	0.718	0.573	0.654	0.718
C	0.768	0.656	0.799	0.732	0.653	0.705	0.731	0.700	0.746	0.685	2.529	2.698
D	2.606	2.268	1.751	2.345	0.830	0.837	1.823	0.916	0.932	2.452	2.329	2.689
E	1.319	1.546	2.410	2.246	2.668	2.763	0.730	2.629	0.689	0.654	2.780	2.582
F	2.703	2.697	0.665	2.126	2.216	2.080	2.266	2.756	2.623	2.532	0.907	2.708
G	2.349	0.733	2.614	0.698	1.889	2.365	2.804	1.439	2.644	2.512	0.700	0.687
H	2.613	2.610	0.761	0.692	0.660	0.721	0.645	0.849	0.711	0.965	0.742	0.724

Report of Raw data
(Plate Blank Subtracted)

DATA FILE: DATA0101.005
DESCRIPTION: ETS 1125 CometabolicEndpt W/O TCE rep#2
PROTOCOL:
MODE: endpoint AUTOMIX: OFF
WAVELENGTH: 590

Fri Jan 01 1993
12:25 pm

CALIBRATION: ON

UNKNOWNS	Mean OD	Std Dev	CV	Well	OD
A01	0.717	*****	*****	A1	0.717
A02	0.812	*****	*****	A2	0.812
A03	0.684	*****	*****	A3	0.684
A04	0.734	*****	*****	A4	0.734
A05	2.441	*****	*****	A5	2.441
A06	2.196	*****	*****	A6	2.196
A07	0.640	*****	*****	A7	0.640
A08	0.701	*****	*****	A8	0.701
A09	0.693	*****	*****	A9	0.693
A10	0.611	*****	*****	A10	0.611
A11	0.669	*****	*****	A11	0.669
A12	0.713	*****	*****	A12	0.713
B01	0.727	*****	*****	B1	0.727
B02	0.660	*****	*****	B2	0.660
B03	0.715	*****	*****	B3	0.715
B04	0.678	*****	*****	B4	0.678
B05	0.701	*****	*****	B5	0.701
B06	0.634	*****	*****	B6	0.634
B07	0.624	*****	*****	B7	0.624
B08	0.719	*****	*****	B8	0.719
B09	0.718	*****	*****	B9	0.718
B10	0.573	*****	*****	B10	0.573

Report of Raw data
(Plate Blank Subtracted)

DATA FILE: DATA0101.005 PAGE: 2
DESCRIPTION: ETS 1125 CometabolicEndpt W/O TCE rep#2 Fri Jan 01 1993
PROTOCOL: 12:26 pm
MODE: endpoint AUTOMIX: OFF
WAVELENGTH: 590 CALIBRATION: ON

UNKNOWNS	Mean OD	Std Dev	CV	Well	OD
B11	0.654	*****	*****	B11	0.654
B12	0.718	*****	*****	B12	0.718
C01	0.788	*****	*****	C1	0.788
C02	0.656	*****	*****	C2	0.656
C03	0.799	*****	*****	C3	0.799
C04	0.732	*****	*****	C4	0.732
C05	0.653	*****	*****	C5	0.653
C06	0.705	*****	*****	C6	0.705
C07	0.731	*****	*****	C7	0.731
C08	0.700	*****	*****	C8	0.700
C09	0.746	*****	*****	C9	0.746
C10	0.685	*****	*****	C10	0.685
C11	2.529	*****	*****	C11	2.529
C12	2.698	*****	*****	C12	2.698
D01	2.606	*****	*****	D1	2.606
D02	2.268	*****	*****	D2	2.268
D03	1.751	*****	*****	D3	1.751
D04	2.345	*****	*****	D4	2.345
D05	0.830	*****	*****	D5	0.830
D06	0.837	*****	*****	D6	0.837
D07	1.823	*****	*****	D7	1.823
D08	0.916	*****	*****	D8	0.916

Report of Raw data
(Plate Blank Subtracted)

DATA FILE: DATA0101.005
DESCRIPTION: ETS 1125 CometabolicEndpt W/O TCE rep#2
PROTOCOL:
MODE: endpoint AUTOMIX: OFF
WAVELENGTH: 590

Fri Jan 01 1993
12:26 pm

CALIBRATION: ON

UNKNOWNS	Mean OD	Std Dev	CV	Well	OD
D09	0.932	*****	*****	D9	0.932
D10	2.452	*****	*****	D10	2.452
D11	2.329	*****	*****	D11	2.329
D12	2.689	*****	*****	D12	2.689
E01	1.319	*****	*****	E1	1.319
E02	1.546	*****	*****	E2	1.546
E03	2.410	*****	*****	E3	2.410
E04	2.246	*****	*****	E4	2.246
E05	2.688	*****	*****	E5	2.688
E06	2.763	*****	*****	E6	2.763
E07	0.730	*****	*****	E7	0.730
E08	2.629	*****	*****	E8	2.629
E09	0.689	*****	*****	E9	0.689
E10	0.654	*****	*****	E10	0.654
E11	2.780	*****	*****	E11	2.780
E12	2.582	*****	*****	E12	2.582
F01	2.703	*****	*****	F1	2.703
F02	2.697	*****	*****	F2	2.697
F03	0.665	*****	*****	F3	0.665
F04	2.126	*****	*****	F4	2.126
F05	2.216	*****	*****	F5	2.216
F06	2.080	*****	*****	F6	2.080

Report of Raw data
(Plate Blank Subtracted)

DATA FILE: DATA0101.005 PAGE: 4
DESCRIPTION: ETS 1125 CometabolicEndpt W/O TCE rep#2 Fri Jan 01 1993
PROTOCOL: 12:26 pm
MODE: endpoint AUTOMIX: OFF
WAVELENGTH: 590 CALIBRATION: ON

UNKNOWNS	Mean OD	Std Dev	CV	Well	OD
F07	2.266	*****	*****	F7	2.266
F08	2.756	*****	*****	F8	2.756
F09	2.623	*****	*****	F9	2.623
F10	2.532	*****	*****	F10	2.532
F11	0.907	*****	*****	F11	0.907
F12	2.708	*****	*****	F12	2.708
G01	2.349	*****	*****	G1	2.349
G02	0.733	*****	*****	G2	0.733
G03	2.614	*****	*****	G3	2.614
G04	0.698	*****	*****	G4	0.698
G05	1.889	*****	*****	G5	1.889
G06	2.365	*****	*****	G6	2.365
G07	2.804	*****	*****	G7	2.804
G08	1.439	*****	*****	G8	1.439
G09	2.644	*****	*****	G9	2.644
G10	2.512	*****	*****	G10	2.512
G11	0.700	*****	*****	G11	0.700
G12	0.687	*****	*****	G12	0.687
H01	2.613	*****	*****	H1	2.613
H02	2.610	*****	*****	H2	2.610
H03	0.761	*****	*****	H3	0.761
H04	0.692	*****	*****	H4	0.692

Report of Raw data
(Plate Blank Subtracted)

DATA FILE: DATA0101.005
DESCRIPTION: ETS 1125 CometabolicEndpt W/O TCE rep#2
PROTOCOL:
MODE: endpoint AUTOMIX: OFF
WAVELENGTH: 590

Fri Jan 01 1993
12:27 pm

CALIBRATION: ON

UNKNOWNS	Mean OD	Std Dev	CV	Well	OD
H05	0.660	*****	*****	H5	0.660
H06	0.721	*****	*****	H6	0.721
H07	0.645	*****	*****	H7	0.645
H08	0.849	*****	*****	H8	0.849
H09	0.711	*****	*****	H9	0.711
H10	0.965	*****	*****	H10	0.965
H11	0.742	*****	*****	H11	0.742
H12	0.724	*****	*****	H12	0.724

Grey scales

DATA FILE: DATA0101.005
DESCRIPTION: ETS 1125 CometabolicEndpt W/O TCE rep#2 Fri Jan 01 1993 12:27 pm
PROTOCOL:
MODE: endpoint AUTOMIX: OFF CALIBRATION: ON
WAVELENGTH: 590