Environmental Assessment of the Alaskan Continental Shelf

Volume 9 Chemistry and Microbiology

Principal Investigators' Reports
for the Year Ending March 1976

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Annual Reports from Principal Investigators

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Volume 9. Chemistry and Microbiology

Fourth quarter and annual reports for the reporting period ending March 1976, from Principal Investigators participating in a multi-year program of environmental assessment related to petroleum development on the Alaskan Continental Shelf. The program is directed by the National Oceanic and Atmospheric Administration under the sponsorship of the Bureau of Land Management.

ENVIRONMENTAL RESEARCH LABORATORIES / Boulder, Colorado / 1976

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ANNUAL REPORT

Assessment of Potential Interactions of Microorganisms and Pollutants Resulting from Petroleum Development on the Outer Continental Shelf in the Beaufort Sea

April 1, 1976

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INTRODUCTION

Microorganisms are essential components of all ecosystems. Changes in microbial populations may greatly alter the characteristics of an ecosystem. Human activities often modify the environment for microorganisms. In some cases microorganisms respond to such changes in a way that lessens the human impact. For example, microorganisms are capable of biodegrading many pollutants that man adds to various ecosystems, often maintaining environmental quality in such situations. In some cases, microorganisms are unable to biodegrade polluting materials and undesirable accumulations of the pollutants occur. In still other situations, mciroorganisms carry out transformations of the pollutants that produce undesirable toxic products. Microorganisms also carry out metabolic activities essential for ecologic balance. Human modification of an environment may alter the ability of microorganisms to carry out key elemental cycling activities. Some microorganisms cause disease in man or other organisms. Human activities may change the populations of such pathogenic microorganisms, altering the incidence of a particular disease.

This project was designed to investigate the potential interactions of microorganisms and pollutants that may result from development of petroleum resources in the outer continental shelf of the Beaufort Sea. Knowledge about the naturally occurring microorganisms is essential for such an assessment. Studies have been begun on establishing a baseline description of microbial communities in the Beaufort Sea. This baseline description includes quantitative information on the occurrence of different physiological groups of microorganisms and on the qualitative taxonomic characteristics of dominant species of microorganisms. It includes information on the ability of the indigenous microorganisms to transform petroleum hydrocarbons that might enter the ecosystem from outer continental shelf petroleum development.

MATERIALS AND METHODS

Literature Review

A review of existing literature on microorganisms in the Beaufort Sea including microorganisms related to petroleum pollutants was conducted using the computer search facilities OASIS and of the Lockheed data base. Data bases searched include National Technical Information Service, Biological Abstracts, Bioresearch Index, Oceanic Index, Selected Water Research Abstracts and Chemical Titles. Abstracts were reviewed and appropriate articles obtained form NTIS or the original source.

Sample Collection

Water and sediment samples were collected during August and September in the Beaufort Sea. Samples were collected from the USGS Beaver aircraft and with small carft. Due to adverse ice conditions sampling was done nearshore, including within Elson Lagoon and Prudhoe Bay. Water samples were collected with a Niskin sterile water sampler. Sediment samples were collected with a mud snapper. Surface ice samples were collected with aseptically with a spatula. A total of 3 ice, 39 water, and 33 sediment samples were collected (Table I). The locations of sample collections are shown in Table II and Figure I.

Abiotic Sample Parameters

Salinity and temperature, determinations were made with a Yellow Springs Instrument Salinometer. Aliquots of samples were filtered through glass filters, placed in acid-washed bottles, rapidly frozen with dry ice and sent to Dr. Vera Alexander for analysis of phosphate, ammonium, nitrate and silicate concentrations.

Enumeration of Microbial Populations

Direct counts from water and sediment. Aliquots of water samples were immediately preserved upon collection by addition of formaldehyde 1:1 v/v. For sediment samples an aliquot was weighed and dried for determination of wet wt./dry wt. conversion factors. A second aliquot was diluted with sterile water and preserved with formaldehyde.

One-tenth to five-tenth milliliters of sample was mixed with one milliliter of 0.1% acridine orange in sterile tris buffer pH 7. One minute after mixing, the stained sample was filtered through a 0.22 μm Sartorius black filter. The filters were immediately viewed with an Olympus epifluorescence microscope, with a BG 12 plus blue exciter filter and a 480 nm blue barrier filter. Cells fluorescing orange or green were counted. Ten fields were counted for each aliquot filtered. Two aliquots from each sample were counted. Counts were converted to number per ml for water samples and to number per gram dry wt. for sediment samples.

Indirect plate counts from water and sediment. Viable microorganisms were enumerated as different physiological groups using different microbiological media and incubation conditions. Two non-selective media, marine agar 2216 and MSWYE, were used for enumeration of total viable microorganisms. Several selective media were also used for enumeration of different groups of microorganisms. TCBS agar was used for enumeration of *Vibrio* species. Pseudosel agar was used for enumeration of *Pseudomonas* species.

SS agar was used for presumptive enumeration of Salmonella-Shigella species. Saboraud dextrose agar was used for enumeration of fungi. Oil agar (Bushnell Haas Agar plus 0.5% Prudhoe crude oil plus marine salts) was used for enumeration of oil-utilizing microorganisms. Counts of oil-degrading microorganisms were corrected for organisms that could grow on Bushnell Haas agar without added oil. These media were either incubated at 5C for enumeration of viable psychrophilic and psychrotrophic microorganisms or at 20C for enumeration of viable mesophilic microorganisms.

Depending on the concentrations of microorganisms in the samples counts were either from surface-spread plates of serial dilutions or from Millipore-filtered (0.45 μm) samples. Counts for 20C plates were done after 10 days of incubation; counts for 5C plates were done after 21 days of incubation. Triplicate plates were used for all counts.

Qualitative Characterization and Identification of Microorganisms from Water and Sediment Samples

Colonies that developed on marine agar 2216 were restreaked for purification. Colonies isolated at 4C and 20C from different samples were selected at random for taxonomic studies. Colonies were also selected at random from 4C and 20C oil agar plates for characterization of range of hydrocarbon metabolism.

For taxonomic characterization an extensive series of tests were run on each organism. A complete list of tests being used is shown in Table III. Not all organisms are characterized with every test. The tests examine three broad areas: morphology, physiology and biochemistry, and nutritional. Tests from each broad area are needed to characterize and classify a microorganism. Morphological tests include size, shape and specific morphological features. Some of these specific features are shown by staining reactions, the key taxonomic staining test being the gram stain. Other specific features, such as motility, presence of endospores, acid-fast stain reaction, arrangement of cells, etc., are keyed to classical bacterial taxonomy. Physiological and biochemical tests include realtions to oxygen, temperature, growth range, salt tolerance, presence of specific enzymes, sensitivity to antibiotics, presence of specific metabolic pathways, etc. These tests can be used both in taxonomic identification of the organisms and in understanding the ecological distribution and role within the ecosystem of these organisms. Nutritional tests included the ability to utilize many different substrates including the ability to metabolize different classes of compounds such as amino acids, carbohydrates, amines, carboxylic acids, alcohols, nucleic acids, and hydrocarbons. Extensive hydrocarbon utilization tests were run for organisms isolated from oil agar.

Analysis of data. In order to analyse the data generated from taxonomic testing, an agreement was made with Dr. Micah Krichevsky, National Institute of Health, for use of the NIH computer programs and facilities. The data is arranged in a searable form so that organisms with any tested characteristic of interest, e.g. ability to metabolize hydrocarbons, can be identified by source of isolation. When testing of organisms is completed, the programs allow for comparison to other organisms including known organisms with generation of similarity coefficients.

RESULTS AND DISCUSSION

Literature Review

A review of the literature showed that while a large number of studies have been reported on distribution of microorganisms in marine environments and on the microbial degradation of petroleum hydrocarbons, only a limited number of such studies have been conducted in or near the Beaufort Sea. A bibliographic listing of those reports directly applicably to the Beaufort Sea is shown in Table IV. Included in this listing are some reports on hydrocarbon biodegradation in soil under Arctic conditions which are relevant for studies on the Beaufort Sea. Table IV also includes a listing of major reviews of the fields of marine microbiology and petroleum microbiology.

An analysis of the literature shows that little is known about the offshore microbial communities in the Beaufort Sea. Studies that have been conducted have been restricted to nearshore regions. This is also true for studies on petroleum biodegradation in the Beaufort Sea.

Abiotic Sample Parameters

The temperatures and salinities of collected samples is shown in Table I. Most salinities were between 15 and 25‰, indicating the influence of terrestrial runoff and melting ice on the samples. The temperatures of all samples collected were less than 3C and generally less than 1C.

Nurtient analyses of the samples are shown in Table V. Phosphate levels in water samples collected near Barrow were significantly higher than those from Prudhoe Bay. Most samples from near Barrow had greater than 4 μg at PO_4-P/l. Ammonium nitrogen was low in almost all samples, less than 1 μg at. NH_3-N/l. Nitrate-N concentrations were higher than ammonium concentrations. Levels of nitrate nitrogen were similar in most samples, approximately 1.5 μg at. NO_3-N/l. There were no major differences in nitrogen levels between Prudhoe Bay and Barrow samples. Levels of silicate were generally higher however in Prudhoe Bay samples, greater than 10 μg at. SiO_3-Si/l, than in Barrow samples, generally less than 10 μg at. SiO_3-Si/l. Water samples 9, 10, and 41 from Elson Lagoon showed higher levels of silicate and nitrate than other samples from that area.

Enumeration of Microorganisms

Direct counts. Direct counts of total microorganisms in ice samples showed about 10^6 organisms/ml (Table VI). Water samples showed similar counts to ice samples, 10^5-10^6 organisms/ml. There were no sigificant differences in direct counts of total microorganisms in water samples collected near Barrow or in Prudhoe Bay. Direct counts from sediment samples were higher than from water samples, of the order 10^7/gm dry wt. As with the water samples there was no significant difference between direct counts of Prudhoe Bay and Barrow sediment samples.

Indirect plate counts. Enumeration of total viable aerobic heterotrophic microorganisms showed higher counts on marine agar 2216 (Tables VII, VIII) than on modified sea water yeast extract medium (Tables IX, X). In ice samples, counts of mesophilic heterotrophic microorganisms (Table VII) were lower than counts of psychrotrophic-psychrophilic organisms. In water and sediment samples counts of heterotrophic mesophiles and psychrophiles-psychrotrophs were not significantly different. Counts in ice and water samples from comparable areas were not significantly different. Counts from sediment samples were generally one order of magnitude higher than from water samples. Counts from water collected in Prudhoe Bay were higher than from water. This difference was most pronounced in the mesophilic counts.

Counts of viable "fungi" (Table XI, XII) were much lower than counts of total heterotrophs. Fungal counts from ice samples were higher than from water samples and were of the same magnitude as fungal counts from sediment samples. Counts of psychrophilic-psychrotrophic fungi from ice samples were higher than comparable mesophilic counts. Fungal counts in water were generally 1-2/ml. Sediment samples generally showed counts of 10-100/gm dry wt. It should be noted that some bacteria are able to grow on the media used to select for fungi and that some bacteria may be included in the "fungal" counts.

Counts of *Pseudomonas* spp. from ice and water samples were low, less than 10/ml except from one ice sample (Table XIII). Counts of *Pseudomonas* spp. from sediment samples were all less than 1/10 ml. Counts of "*Salmonella-Shigella*" species (Table XIV) showed similar patterns as the *Pseudomonas*. Only one ice sample showed high counts of "*Salmonella-Shigella*" species. Counts of *Vibrio* spp. on the other hand were in excess of 100/ml from most ice and water samples. *Vibrio* counts were very low in the ice sample that had the high "*Salmonella-Shigella*" and Pseudomonas counts. Counts of psychrophilic-psychrotrophic *Vibrio* were significantly higher than counts of mesophilic *Vibrio*.

Counts of oil-utilizing psychrophiles-psychrotrophs were higher in sediment samples than in water samples (Table XVII). In water concentrations of psychrophilic-psychrotrophic oil-utilizing microorganisms were generally less than 1/10 ml. Counts from Prudhoe Bay water samples were higher on the average than from water samples collected near Barrow. Counts of mesophilic oil-utilizing microorganisms (Table XVIII) were higher than counts of psychrophilic-psychrotrophic oil-utilizing microorganisms. There was no significant difference in mesophilic oil-utilizing counts between samples collected in Prudhoe Bay and near Barrow. Except for one water and one ice sample oil-utilizing microorganisms were isolated from every 10 ml water or ice and 1 g sediment sample.

Qualitative Characterization of Microbial Isolants

A total of 552 microbial isolants have been characterized with respect to their nutritional and physiological characteristics. Most morphological characteristics of these isolants have not yet been examined. The sources of isolation for these organisms are shown in Tables XIX and XX. The sources of the isolants were closer to include stations near Barrow, in Prudhoe Bay, and from an intermediate location.

Summaries of some key characteristics of these organisms are shown in Tables XXI-XXIII. These tables show the total number of strains by type of sample and incubation temperature which had a particular characteristic. With respect to the morphological characteristic of pigment color, an easily recognized characteristic, only a low percentage of all organisms produced diffusible pigments. About half of the isolants produced pigments that were not diffusible and about half produced non-pigmented gray colonies.

Physiological characterization showed the ability of the isolants to tolerate various temperatures, salinities, and pH levels. Greater than 95% of all isolants were able to grow at temperatures of 10 and 15C. Ninety-five percent of the 20C isolants could grow at 5C, making them psychrotrophs. Thirty-two percent of the 4C isolants could not grow at 20C, indicating that they were psychrophiles. Only 3% of all isolants were able to grow at 37C, the temperature of warm-blooded animals. Such information should be valuable in predicting and detecting effects of heated pipelines. While 91% of all isolants could tolerate 3% NaCl, only 73% were tolerant to 5% NaCl and only 35% to 7.5% NaCl. Sediment isolants were more sensitive than water isolants. Brine influx from drilling operations would thus be deletorious to many of the indigenous microorganisms. Tests on the ability to tolerate different pH levels showed that most organisms could tolerate a decrease in pH from the normal 8.3 of seawater to an acidic pH of 6 but not to more acid conditions.

Examination of the nutritional characteristics of the isolants showed that 84% required growth factors. Vitamins were required by 56% of the isolants. Twenty-eight percent had more complex growth factors and 6% could only be cultured on complex media. Almost twice as many sediment isolants required yeast extract and amino acids as water isolants.

Carbohydrates were the most readily utilized class of components followed by amino acids, dicarboxylic TCA cycle intermediates, alcohols, and fatty acids. More water isolants were capable of utilizing these compounds than sediment isolants.

Only 2% of all isolants were able to utilize hydrocarbons. All but one of these isolants should be capable of metabolizing hydrocarbons at 5C in the presence of 3% NaCl. Forty-three percent of all isolants were capable of utilizing fatty acids which are intermediary metabolites of hydrocarbon biodegradation. Thus, following primary attack on the hydrocarbon, these organisms would be capable of utilizing the fatty acids formed. Thirty-four percent of the isolants could grow on acetate, a breakdown product of fatty acid metabolism. Less than 2% of all isolants were capable of utilizing benzoic and or phenol which may be intermediary metabolites of aromatic hydrocarbon metabolism.

Tables XXIV-XLIV show further summary data analysis by station. The general trends discussed above held for all stations, but on some specific tests at a given station, there was great variability. For example, organisms from near Barrow within Elson Lagoon (Station 2) were less tolerant of high NaCl concentration and low pH levels than organisms from offshore in that area (Station 10). In contrast, organisms offshore at Prudhoe Bay (Station 71) were less tolerant to high NaCl concentrations than organisms from nearshore (Station 55). Station 70 which was located between Stations 55 and 71 showed similar physiological characteristics as the nearshore location but intermediate nutritional characteristics compared to Stations 55 and 71.

With respect to hydrocarbon metabolism the highest percentage of hydrocarbon utilizers were found at Station 10, 7% of the total population. At several stations less than 20% of the total population was capable of hydrocarbon metabolism. The distribution of hydrocarbon-utilizing microorganisms was equally distributed between sediment and water.

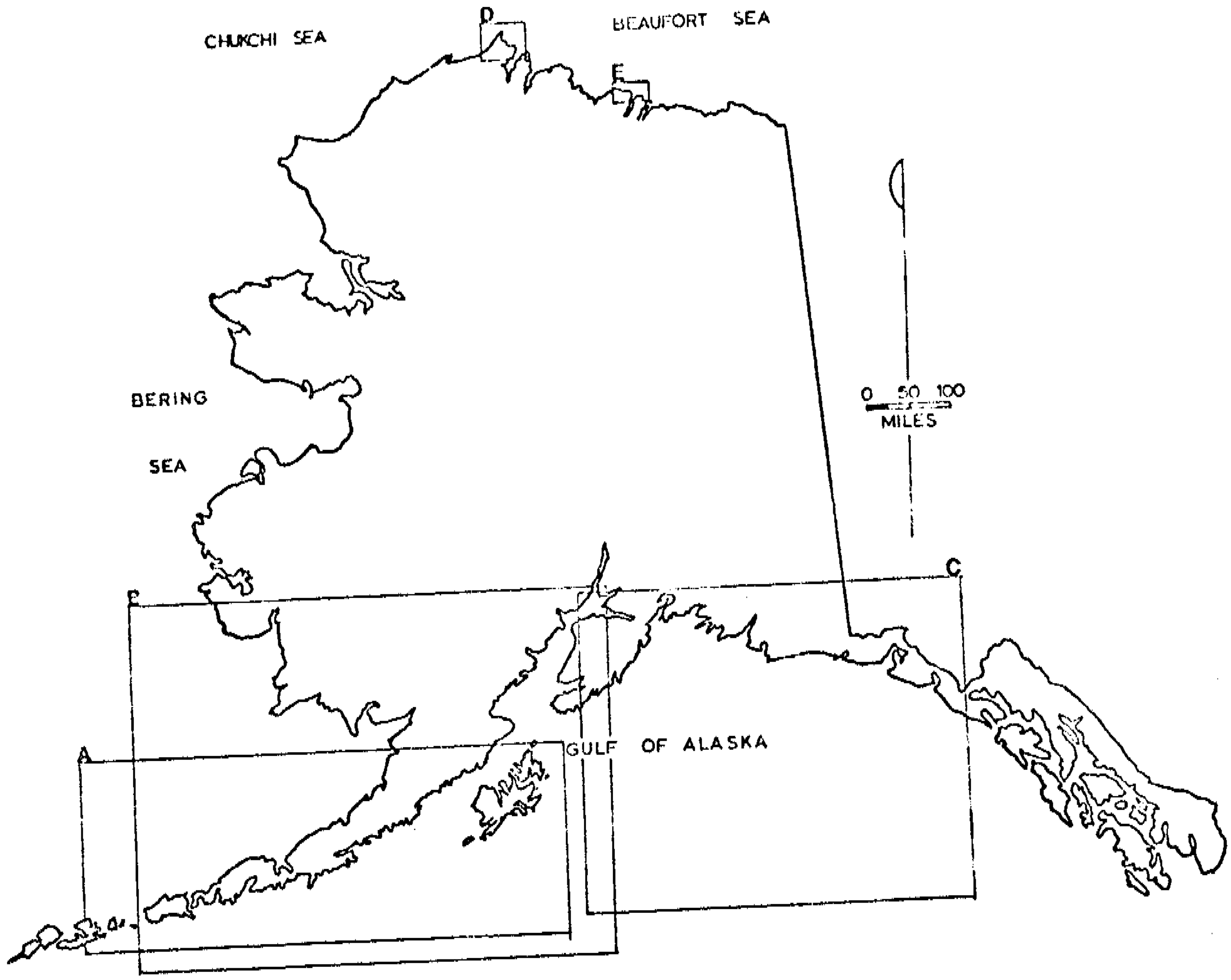
Much more detailed tables showing which organisms had specific characteristics are included in an appendix to this report.

Future Work

During the remainder of the contract two more samplings are scheduled, one using helicopters and the other aboard an icebreaker. One of the samplings will begin April 1. Additionally, beach samples are being collected. These samples will be processed for enumeration of microorganisms and compared to the previous samples. Microorganisms will be isolated from these samples for taxonomic characterization. It is anticipated that taxonomic characterization should be completed on microorganisms isolated from the August-September samples as well as the April sampling by October 1, 1976. Isolants from the August 1976 cruise will not be completed by that date.

As planned, assays will be made during the forthcoming samplings for rates of hydrocarbon biodegradation and bioemulsification. Assay should be completed by October. A complete proposal for future work during a second-year contract is being prepared.

Fig. 1a. Locations of sampling sites in the Barrow area.


CHUKCHI SEA
BEAUFORT SEA
D
E
BERING
SEA
0 50 100
MILES
C
A
GULF OF ALASKA

D

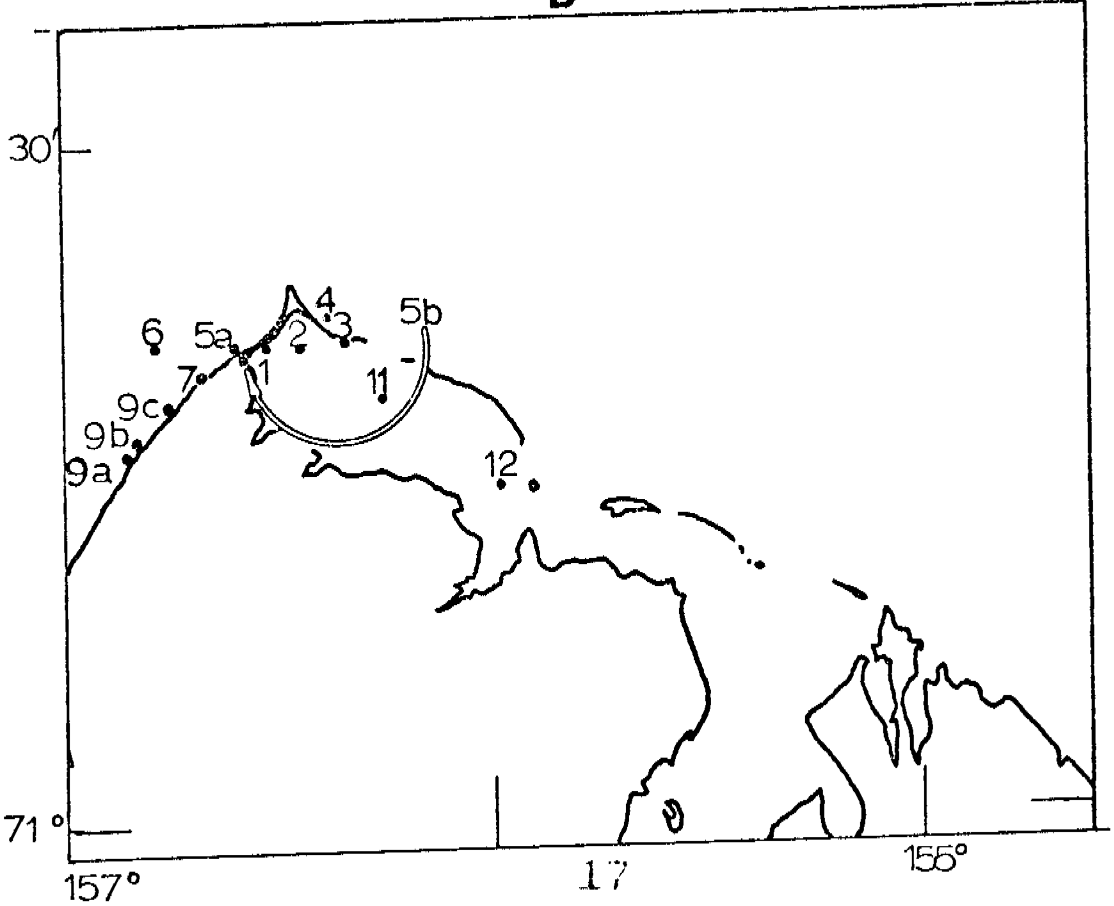
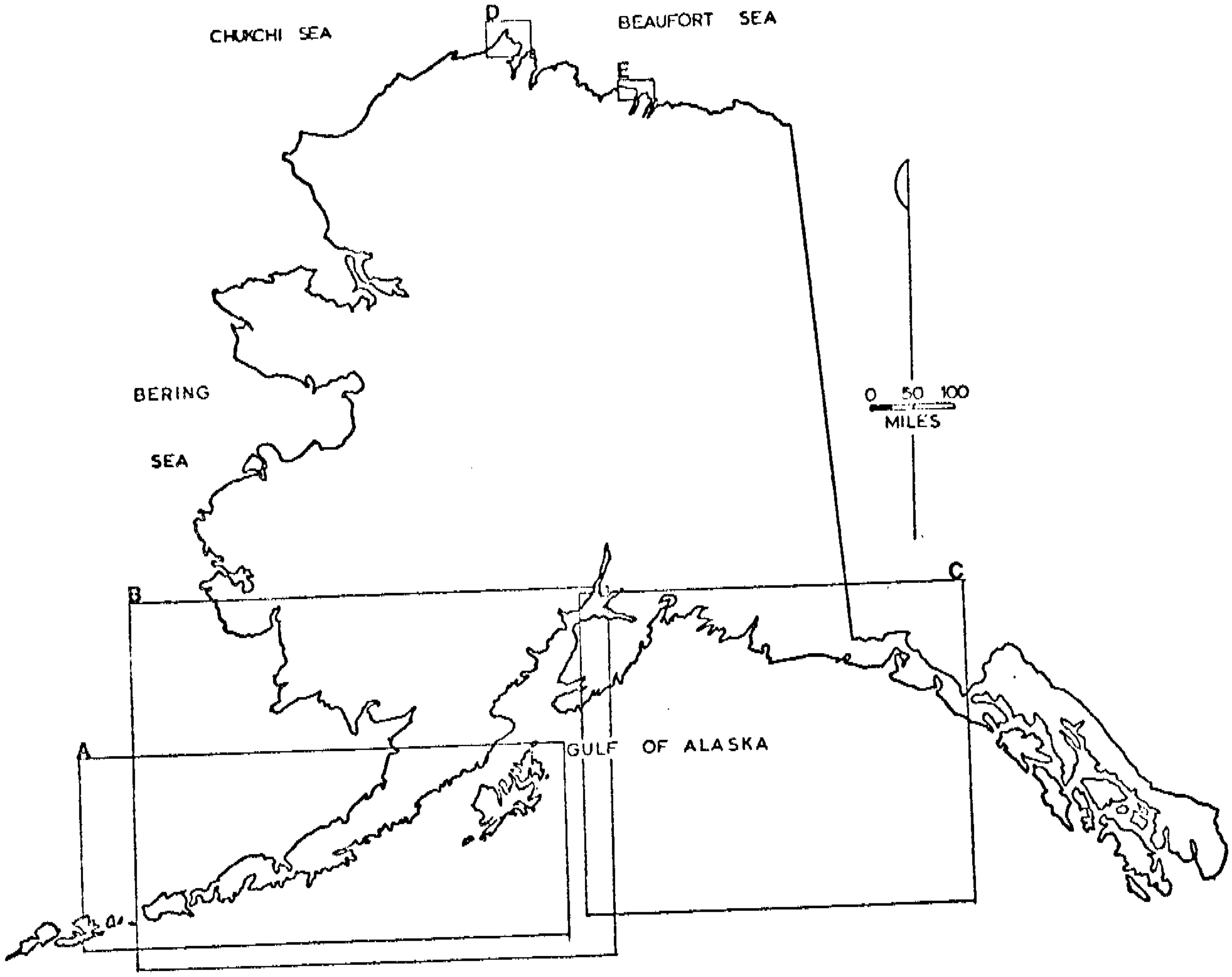

30'
71°
157°
155°
6
5a
2
4
3
5b
1
7
11
9c
9b
9a
12

Fig. 1b. Locations of sampling sites near Prudhoe Bay.


CHUKCHI SEA
BEAUFORT SEA
D
E
BERING
SEA
0 50 100
MILES
A
B
C
GULF OF ALASKA

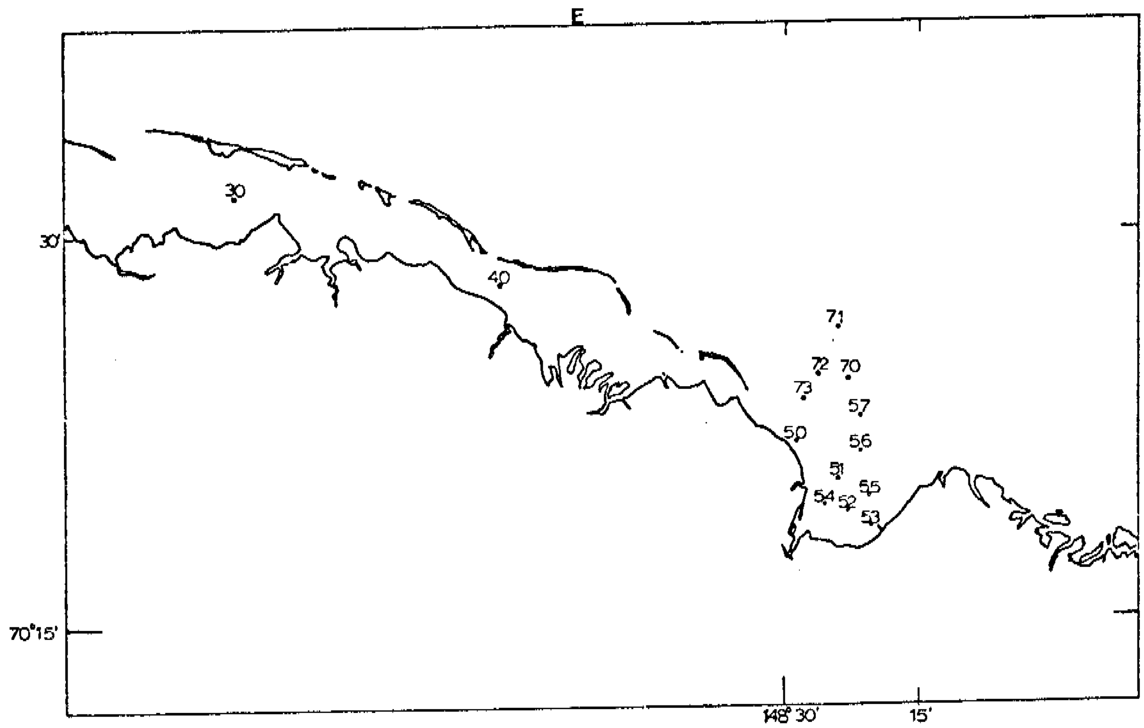

E
30
40
71
72
70
73
57
50
56
51
55
54
52
53
30'
70°15'
148°30'
15'

Table I

SAMPLE DESCRIPTION

SAMPLE NO.	Day	MoYr	Location: Sea	Location: Area	Station	Type
ICE						
*BW0005?01	30	0875	CHUKCHI	BARROW	STATION05B	ICE
*BW0038?01	23	0975	CHUKCHI	BARROW	STATION09A	ICE
*BW0039?01	23	0975	CHUKCHI	BARROW	STATION09B	ICE
*BW0040?01	23	0975	CHUKCHI	BARROW	STATION09C	ICE
WATER						
*BW0042?01	23	0975	CHUKCHI	BARROW	STATION05B	WATER
*BW0008?01	31	0875	CHUKCHI	BARROW	STATION06	WATER
*BW0043?01	25	0975	CHUKCHI	BARROW	STATION08	WATER
*BW0001?01	20	0875	BEAUFORT	ELSON LAGOON	STATION01	WATER
*BW0002?01	20	0875	BEAUFORT	ELSON LAGOON	STATION01	WATER
*BW0003?01	28	0875	BEAUFORT	ELSON LAGOON	STATION10	WATER
*BW0019?01	11	0975	BEAUFORT	ELSON LAGOON	STATION01	WATER
*BW0035?01	17	0975	BEAUFORT	ELSON LAGOON	STATION01	WATER
*BW0020?01	11	0975	BEAUFORT	ELSON LAGOON	STATION02	WATER
*BW0036?01	17	0975	BEAUFORT	ELSON LAGOON	STATION02	WATER
*BW0009?01	05	0975	BEAUFORT	ELSON LAGOON	STATION03	WATER
*BW0021?01	11	0975	BEAUFORT	ELSON LAGOON	STATION03	WATER
*BW0037?01	17	0975	BEAUFORT	ELSON LAGOON	STATION03	WATER
*BW0010?01	05	0975	BEAUFORT	PLOVER PT.	STATION04	WATER
*BW0022?01	11	0975	BEAUFORT	ELSON LAGOON	STATION04	WATER
*BW0041?01	23	0975	BEAUFORT	ELSON LAGOON	STATION05A	WATER
*BW0006?01	31	0875	BEAUFORT	ELSON LAGOON	STATION11	WATER
*BW0004?01	28	0875	BEAUFORT	POINT BARROW	STATION12	WATER
*BW0007?01	31	0875	BEAUFORT	POINT BARROW	STATION12	WATER
*BW0011?01	05	0975	BEAUFORT	OLIKTOK PT.	STATION30	WATER
*BW0012?01	05	0975	BEAUFORT	PRUDHOE BAY	STATION40	WATER
*BW0028?01	13	0975	BEAUFORT	PRUDHOE BAY	STATION50	WATER
*BW0017?01	08	0975	BEAUFORT	PRUDHOE BAY	STATION51	WATER
*BW0013?01	05	0975	BEAUFORT	PRUDHOE BAY	STATION52	WATER
*BW0029?01	13	0975	BEAUFORT	PRUDHOE BAY	STATION52	WATER
*BW0014?01	08	0975	BEAUFORT	PRUDHOE BAY	STATION53	WATER
*BW0023?01	12	0975	BEAUFORT	PRUDHOE BAY	STATION53	WATER
*BW0018?01	08	0975	BEAUFORT	PRUDHOE BAY	STATION54	WATER
*BW0015?01	08	0975	BEAUFORT	PRUDHOE BAY	STATION55	WATER
*BW0016?01	08	0975	BEAUFORT	PRUDHOE BAY	STATION55	WATER
*BW0024?01	12	0975	BEAUFORT	PRUDHOE BAY	STATION55	WATER
*BW0025?01	12	0975	BEAUFORT	PRUDHOE BAY	STATION56	WATER
*BW0030?01	13	0975	BEAUFORT	PRUDHOE BAY	STATION57	WATER
*BW0026?01	12	0975	BEAUFORT	PRUDHOE BAY	STATION70	WATER
*BW0031?01	13	0975	BEAUFORT	PRUDHOE BAY	STATION70	WATER
*BW0027?01	12	0975	BEAUFORT	PRUDHOE BAY	STATION71	WATER
*BW0032?01	13	0975	BEAUFORT	PRUDHOE BAY	STATION71	WATER
*BW0033?01	14	0975	BEAUFORT	PRUDHOE BAY	STATION72	WATER
*BW0034?01	14	0975	BEAUFORT	PRUDHOE BAY	STATION73	WATER

Table I (cont'd)

SEDIMENT

*BB0001?01	20	0875BEAUFORT	ELSON LAGOON	STATION01	SEDIMENT
*BB0002?01	20	0875BEAUFORT	ELSON LAGOON	STATION01	SEDIMENT
*BB0015?01	11	0975BEAUFORT	ELSON LAGOON	STATION01	SEDIMENT
*BB0031?01	17	0975BEAUFORT	ELSON LAGOON	STATION01	SEDIMENT
*BB0016?01	11	0975BEAUFORT	ELSON LAGOON	STATION02	SEDIMENT
*BB0032?01	17	0975BEAUFORT	ELSON LAGOON	STATION02	SEDIMENT
*BB0007?01	05	0975BEAUFORT	ELSON LAGOON	STATION03	SEDIMENT
*BB0017?01	11	0975BEAUFORT	ELSON LAGOON	STATION03	SEDIMENT
*BB0008?01	05	0975BEAUFORT	PLOVER PT	STATION04	SEDIMENT
*BB0018?01	11	0975BEAUFORT	ELSON LAGOON	STATION04	SEDIMENT
*BB0033?01	17	0975BEAUFORT	ELSON LAGOON	STATION03	SEDIMENT
*BB0003?01	28	0875BEAUFORT	ELSON LAGOON	STATION10	SEDIMENT
*BB0005?01	31	0875BEAUFORT	ELSON LAGOON	STATION11	SEDIMENT
*BB0004?01	28	0875BEAUFORT	PT BARROW	STATION12	SEDIMENT
*BB0006?01	31	0875BEAUFORT	PT BARROW	STATION12	SEDIMENT
*BB0009?01	05	0975BEAUFORT	OLIGTOK PT	STATION30	SEDIMENT
*BB0010?01	05	0975BEAUFORT	PRUDHOE BAY	STATION40	SEDIMENT
*BB0023?01	13	0975BEAUFORT	PRUDHOE BAY	STATION50	SEDIMENT
*BB0013?01	08	0975BEAUFORT	PRUDHOE BAY	STATION51	SEDIMENT
*BB0024?01	13	0975BEAUFORT	PRUDHOE BAY	STATION51	SEDIMENT
*BB0025?01	13	0975BEAUFORT	PRUDHOE BAY	STATION52	SEDIMENT
*BB0011?01	08	0975BEAUFORT	PRUDHOE BAY	STATION53	SEDIMENT
*BB0019?01	12	0975BEAUFORT	PRUDHOE BAY	STATION53	SEDIMENT
*BB0014?01	08	0975BEAUFORT	PRUDHOE BAY	STATION54	SEDIMENT
*BB0012?01	08	0975BEAUFORT	PRUDHOE BAY	STATION55	SEDIMENT
*BB0020?01	12	0975BEAUFORT	PRUDHOE BAY	STATION55	SEDIMENT
*BB0026?01	13	0975BEAUFORT	PRUDHOE BAY	STATION57	SEDIMENT
*BB0021?01	12	0975BEAUFORT	PRUDHOE BAY	STATION70	SEDIMENT
*BB0027?01	13	0975BEAUFORT	PRUDHOE BAY	STATION70	SEDIMENT
*BB0022?01	12	0975BEAUFORT	PRUDHOE BAY	STATION71	SEDIMENT
*BB0028?01	13	0975BEAUFORT	PRUDHOE BAY	STATION71	SEDIMENT
*BB0029?01	14	0975BEAUFORT	PRUDHOE BAY	STATION72	SEDIMENT
*BB0030?01	14	0975BEAUFORT	PRUDHOE BAY	STATION73	SEDIMENT

Table II

SAMPLE LOCATION

SAMPLE NO.	Latitude	Longitude	Depth (m)	Sali-nity (°/oo)	Temp. (C)
ICE					
*BW0005?02	71-20.81N	156-35.17W	–	00.0	–
*BW0038?02	71-17.23N	156-48.48W	–	00.0	–
*BW0039?02	71-17.90N	156-46.30W	–	00.0	–
*BW0040?02	71-18.85N	156-43.37W	–	00.0	–
WATER					
*BW0042?02	71-20.81N	156-35.17W	00.0	25.5	-1.0
*BW0008?02	71-21.01N	156-42.18W	01.0	25.5	+2.0
*BW0043?02	71-23.15N	156-29.24W	00.0	26.0	-1.2
*BW0001?02	71-21.22N	156-32.17W	01.0	26.0	+3.0
*BW0002?02	71-21.22N	156-32.17W	01.0	26.5	+3.2
*BW0003?02	71-25.00N	156-20.00W	01.0	23.8	-0.5
*BW0019?02	71-21.22N	156-32.17W	01.0	18.3	-0.5
*BW0035?02	71-21.22N	156-32.17W	01.0	22.0	-0.5
*BW0020?02	71-21.49N	156-26.19W	01.0	18.2	<0.0
*BW0036?02	71-21.49N	156-26.19W	01.0	22.2	-0.5
*BW0009?02	71-21.55N	156-21.08W	01.0	20.0	-0.2
*BW0021?02	71-21.55N	156-21.08W	01.0	18.5	<0.0
*BW0037?02	71-21.55N	156-21.08W	01.0	22.2	-0.5
*BW0010?02	71-22.13N	156-21.74W	01.0	20.5	-0.2
*BW0022?02	71-22.13N	156-21.74W	01.0	18.8	<0.0
*BW0041?02	71-20.94N	156-35.22W	00.0	27.0	-1.0
*BW0006?02	71-19.00N	156-15.79W	01.0	17.0	+2.0
*BW0004?02	71-15.70N	156-00.00W	01.0	22.5	+2.0
*BW0007?02	71-15.70N	156-00.00W	01.0	21.0	+1.5
*BW0011?02	70-30.60N	149-34.21W	01.0	12.1	+1.9
*BW0012?02	70-26.50N	149-03.15W	01.0	18.8	+1.8
*BW0028?02	70-21.78N	148-27.53W	01.0	17.8	+2.5
*BW0017?02	70-20.87N	148-23.95W	01.0	11.4	-0.5
*BW0013?02	70-20.00N	148-22.06W	01.0	20.0	+1.5
*BW0029?02	70-20.00N	148-22.06W	01.0	18.1	+1.9
*BW0014?02	70-19.14N	148-19.35W	01.0	11.8	-0.8
*BW0023?02	70-19.14N	148-19.35W	01.0	14.5	+1.0
*BW0018?02	70-20.11N	148-26.05W	01.0	09.0	-0.4
*BW0015?02	70-20.31N	148-20.02W	01.0	11.1	-0.8
*BW0016?02	70-20.31N	148-20.02W	02.3	19.8	-0.4
*BW0024?02	70-20.31N	148-20.02W	01.0	16.0	+1.5
*BW0025?02	70-21.74N	148-20.84W	01.0	19.5	+1.5
*BW0030?02	70-22.90N	148-21.45W	01.0	16.2	+2.2
*BW0026?02	70-24.53N	148-22.29W	01.0	20.0	+1.0
*BW0031?02	70-24.53N	148-22.29W	01.0	18.5	+1.5
*BW0027?02	70-26.57N	148-23.47W	01.0	21.5	+0.5
*BW0032?02	70-26.57N	148-23.47W	01.0	20.2	+0.3
*BW0033?02	70-24.64N	148-25.96W	01.0	16.0	+1.9
*BW0034?02	70-23.59N	148-27.26W	01.0	15.8	+2.3

Table II (cont'd)

SEDIMENT					
*BB0001?02	71-21.22N	156-32.17W	03.7	—	+3.0
*BB0002?02	71-21.22N	156-32.17W	02.3	—	+3.2
*BB0015?02	71-21.22N	156-32.17W	02.3	—	—
*BB0031?02	71-21.22N	156-32.17W	02.0	—	-0.5
*BB0016?02	71-21.49N	156-26.19W	02.0	—	—
*BB0032?02	71-21.49N	156-26.19W	02.3	—	-0.5
*BB0007?02	71-21.55N	156-21.08W	11.3	—	—
*BB0017?02	71-21.55N	156-21.08W	11.3	—	—
*BB0008?02	71-22.13N	156-21.74W	08.0	—	—
*BB0018?02	71-22.13N	156-21.74W	08.0	—	—
*BB0033?02	71-21.55N	156-21.08W	02.3	—	-0.5
*BB0003?02	71-25.00N	156-20.00W	09.3	—	—
*BB0005?02	71-19.00N	156-15.79W	03.3	17.0	+2.0
*BB0004?02	71-15.70N	156-00.00W	02.0	22.8	—
*BB0006?02	71-15.70N	156-00.00W	03.3	—	+1.5
*BB0009?02	70-30.60N	149-34.21W	02.0	—	+2.9
*BB0010?02	70-26.50N	149-03.15W	02.0	—	+1.8
*BB0023?02	70-21.78N	148-27.53W	01.7	17.5	+2.3
*BB0013?02	70-20.87N	148-23.95W	02.7	19.8	-0.2
*BB0024?02	70-20.87N	148-23.95W	02.3	19.3	+2.2
*BB0025?02	70-20.00N	148-22.06W	02.7	18.5	+2.2
*BB0011?02	70-19.14N	148-19.35W	02.0	19.2	-0.8
*BB0019?02	70-19.14N	148-19.35W	02.7	19.5	+1.0
*BB0014?02	70-20.11N	148-26.05W	01.7	17.5	-0.2
*BB0012?02	70-20.31N	148-20.02W	02.3	19.8	-0.4
*BB0020?02	70-20.31N	148-20.02W	03.3	20.0	+1.5
*BB0026?02	70-22.90N	148-21.45W	01.7	19.2	+1.8
*BB0021?02	70-24.53N	148-22.29W	03.0	21.0	+1.0
*BB0027?02	70-24.53N	148-22.29W	06.7	21.5	+0.3
*BB0022?02	70-26.57N	148-23.47W	07.7	22.5	0.0
*BB0028?02	70-26.57N	148-23.47W	06.3	21.3	0.0
*BB0029?02	70-24.64N	148-25.96W	05.0	19.2	+0.6
*BB0030?02	70-23.59N	148-27.26W	02.3	20.2	+1.5

Table III

ATLAS QUESTION SET SEQUENTIAL

003001: Cells are spherical.
003005: Cells are pear-shaped.
003008: Cells are rod-shaped.
003011: Rod axis is curved in one plane.
003013: Rod axis is helical (spiral).
003016: Rods have tapered ends.
003017: Rods have rounded ends.
003018: Rods have square ends.
003023: Pleomorphic cells are characteristic.
003026: Longer axis of rod is less than twice the shorter axis (cocco-bacillary).
004001: Longest axis of each cell is less than 0.5 micrometer.
004002: Longest axis of each cell is 0.5 - 1 micrometer.
004003: Longest axis of each cell is 1.1 - 2.0 micrometers.
004004: Longest axis of each cell is 2.1 - 3.0 micrometers.
004005: Longest axis of each cell is 3.1 - 4.0 micrometers.
004006: Longest axis of each cell is 4.1 - 5.0 micrometers.
004007: Longest axis of each cell is 5.1 - 10 micrometers.
004008: Longest axis of each cell is 11 - 15 micrometers.
004009: Longest axis of each cell is 16 - 100 micrometers.
004011: Shortest axis of each cell is less than 0.5 micrometer.
004012: Shortest axis of each cell is 0.5 - 1 micrometer.
004013: Shortest axis of each cell is 1.1 - 2.0 micrometers.
004014: Shortest axis of each cell is 2.1 - 3.0 micrometers.
004015: Shortest axis of each cell is 3.1 - 4.0 micrometers.
004016: Shortest axis of each cell is 4.1 - 5.0 micrometers.
005004: Poly beta-hydroxybutyric acid inclusions in the cell.
005006: Poly metaphosphate inclusions (volutin) in the cell.
006001: Endospores produced (any refractile intracellular body capable of germination into a new vegetative cell).
006007: Endospore(s) central in sporangium.
006008: Endospore(s) terminal.
006014: Endospores wider than the vegetative cell (sporangium swollen).
008001: Cells branch.
011001: Capsule is present.
012009: Cells are acid fast by Ziehl-Neelsen method.
012014: Sudan black B reveals intracellular lipids (fat bodies) (also see Sections 5 and 21).
012021: Gram positive.
012022: Gram negative.
012023: Gram variable.
013001: Cells motile.
013004: Cells demonstrate creeping or gliding motility on a solid surface.
013009: Cells have flagella.
013010: Flagella polar.
013022: Flagella peritrichous.
013023: Two or more flagella of distinctly different appearance in different locations on the cell.
015001: Cells occur singly.
015002: Cells occur in pairs.
015003: Cells arranged in angular fashion after division (snapping).
015004: Cells occur in chains.
015005: Cells arranged in irregular aggregates.

015006: Cells arranged in two-dimensional tetrads.
015007: Cells arranged in cubical packets (three-dimensional).
015017: Organisms filamentous, greater than 10 micrometers, if multicellular the organism has little or no indentation at each septum (For branched filaments also see Section 8).
016005: Agar macro-colonies are translucent.
016006: Agar macro-colonies are transparent.
016007: Agar macro-colonies are opaque.
016008: Agar macro-colony margin is entire.
016009: Agar macro-colony margin is erose.
016010: Agar macro-colony margin is filamentous (rhizoid).
016015: Agar macro-colony is convoluted.
016016: Agar macro-colony is flat (membranous).
016017: Agar macro-colony is raised but not convex.
016018: Agar macro-colony is umbonate.
016019: Colony swarming is exhibited on agar (dispersion of individual members of a population due to active motility).
016023: Colony consistency is viscid (mucoid).
016027: Colony surface is glistening.
016028: Colony surface is dull (matte).
016030: Colony surface is smooth.
016031: Colony surface is rough.
016043: Floccular growth in liquid culture.
016044: Ring growth on the wall of the tube in liquid culture.
016046: Pellicle in liquid culture.
016053: Growth takes place at an initial pH of 9.0.
016054: Growth takes place at an initial pH of 7.0.
016055: Growth takes place at an initial pH of 6.0.
016056: Growth takes place at an initial pH of 5.0.
016057: Growth takes place at an initial pH of 4.0.
016060: In 1.5-2.0% previously solidified agar, inoculated by stab, growth is confined to the surface or a depth from the surface of approximately no greater than 1 mm. (i.e., an obligate aerobe)
016062: In 1.5-2.0% previously solidified agar, inoculated by stab, growth begins BELOW THE SURFACE when incubated in air.
016063: In 1.5-2.0% previously solidified agar, inoculated by seeding or by stab, incubated in air, growth is largely confined to a linear dimension of approximately 5 cm from the bottom of the tube in a 16 x 150 mm tube filled with medium to a depth of 9-10 cm. (i.e., obligate anaerobe)
016136: Molecular nitrogen can be used as the sole source of nitrogen.
016137: Ammonium salts can serve as the sole source of nitrogen for growth.
016138: Nitrate can serve as the sole source of nitrogen for growth.
016139: Nitrite can serve as the sole source of nitrogen for growth.
016187: Growth takes place at an initial pH of 8.0.
016189: Agar macro-colony is convex.
016190: Turbidity of liquid culture is evenly dispersed.
016194: Growth takes place at an initial pH of 10.0.
016206: Maximum turbidity in liquid cultures is slight.
016207: Maximum turbidity in liquid cultures is moderate.
016208: Maximum turbidity in liquid cultures is heavy.
016212: At least one vitamin (growth factor) is required for growth.
016249: Urea can be used as the sole source of nitrogen.
016347: Urea can be used as the sole source of carbon and nitrogen.
016357: Isolated agar colonies are less than 1 mm. diameter within ten days.
016358: Isolated agar colonies are 1-2 mm diameter within ten days.
016359: Isolated agar colonies are 2-6 mm diameter within ten days.
016361: Agar macro-colony margin is lobate.

016362: Agar macro-colony margin is undulate.
016363: Colony spreading is exhibited on agar (growth extends several millimeters or more beyond the point of innoculation).
016369: Gelling agent (eg., agar) is required for growth.
017011: Growth at 0 C.
017012: Growth at 10 C.
017013: Growth at 15 C.
017014: Growth at 25 C.
017015: Growth at 37 C.
017032: Growth at 5 C.
017037: Growth at 20 C.
017045: Growth at 43 C.
018003: Growth in the presence of 0.5% NaCl.
018004: Growth in the presence of 3% NaCl.
018006: Growth in the presence of 5% NaCl.
018008: Growth in the presence of 10% NaCl.
018009: Growth in the presence of 15% NaCl.
018022: Growth in the presence of 7.5% NaCl.
018028: Added NaCl is required for growth.
019001: Sensitive to ampicillin concentration (disc) 2 ugm.
019021: Sensitive to bacitracin concentration (disc) 2 units.
019043: Sensitive to chloromycetin (chloramphenicol) concentration (disc) 5 ugm.
019044: Sensitive to chloromycetin (chloramphenicol) concentration (disc) 30 ugm.
019063: Sensitive to chlortetracycline (aureomycin) concentration (disc) 30 ugm.
019064: Sensitive to colistin concentration (disc) 2 ugm.
019065: Sensitive to colistir concentration (disc) 10 ugm.
019084: Sensitive to 2,4-diamino-6,7-diisopropylpteridine (0/129 vibriostat) crystals on agar.
019085: Sensitive to erythromycin (ilotycin) concentration (disc) 2 ugm.
019086: Sensitive to erythromycin (ilotycin) concentration (disc) 15 ugm.
019105: Sensitive to kanamycin concentration (disc) 5 ugm.
019106: Sensitive to kanarycir concentration (disc) 30 ugm.
019129: Sensitive to nalidixic acid concentration (disc) 30 ugm.
019148: Sensitive to neomycin (mycifradin) concentration (disc) 5 ugm.
019149: Sensitive to neomycin (mycifradin) concentration (disc) 30 ugm.
019168: Sensitive to nitrofurantoin concentration (disc) 100 ugm.
019169: Sensitive to nitrofurantoin concentration (disc) 300 ugm.
019188: Sensitive to novobiocin (albamycin) concentration (disc) 30 ugm.
019208: Sensitive to oxytetracycline (tetramycin, terramycin) concentration (disc) 30 ugm.
019210: Sensitive to penicillin G concentration (disc) 2 units.
019211: Sensitive to penicillin G concentration (disc) 10 units.
019230: Sensitive to polymyxin B (aerosporin) concentration (disc) 50 units.
019231: Sensitive to polymyxin B (aerosporin) concentration (disc) 300 units.
019233: Sensitive to streptomycin concentration (disc) 2.0 ugm.
019235: Sensitive to streptomycin concentration (disc) 10 ugm.
019274: Sensitive to tetracycline (achromycin) concentration (disc) 5 ugm.
019275: Sensitive to tetracycline (achrómycin) concentration (disc) 30 ugm.
019294: Sensitive to triple sulfa (sulfadiazine/sulfamethazine/ sulfamerazine) concentration (disc) 1 mgm.
019297: Sensitive to vancocyn (vancomycin) concentration (disc) 30.0 ugm.
019374: Sensitive to gentamicin concentration (disc) 10 ugm.

019430: Sensitive to ampicillin concentration (disc) 10 ugm.
019484: Sensitive to chlortetracycline (aureomycin) concentration (disc) 5 ugm.
019486: Sensitive to novobiocin (albamycin) concentration (disc) 5 ugm.
020001: Colonies are pure (paper) white on solid medium.
020002: Colonies are gray on solid medium.
020007: Colonies luminescent in the dark.
020019: Diffusible (water-soluble) pigments are produced.
020020: Diffusible blue pigments are produced.
020021: Diffusible yellow pigments are produced.
020022: Diffusible green pigments are produced.
020023: Diffusible red pigments are produced.
020024: Diffusible orange pigments are produced.
020025: Diffusible violet (purple) pigments are produced.
020026: Diffusible brown pigments are produced.
020027: Diffusible black pigments are produced.
020038: Non-diffusible red pigments are produced.
020039: Non-diffusible brown pigments are produced.
020040: Non-diffusible green pigments are produced.
020041: Non-diffusible violet (purple) pigments are produced.
020042: Non-diffusible blue pigments are produced.
020043: Non-diffusible golden (yellow) pigments are produced.
020044: Non-diffusible orange pigments are produced.
020057: Non-diffusible black pigments are produced.
020058: Colonies fluoresce with short wavelength ultraviolet light (ca. 260 nm.).
020060: Fluorescent pigment observable with short wavelength ultraviolet light (ca. 260 nm.).
020080: Non-diffusible pigment occurs only in the center of the colony.
020081: Non-diffusible pigment occurs in concentric rings within the colony.
024004: Agar is hydrolyzed (liquefied).
024005: Carrageenin is degraded.
024007: Casein is hydrolyzed (peptonized).
024009: Gelatin is hydrolyzed (liquefied).
024011: Pectin is hydrolyzed.
024014: D-Glucose catabolized aerobically.
024015: D-Glucose catabolized anaerobically.
024114: Tryptophan yields indole.
024135: Ammonia is produced.
024138: Nitrate is reduced.
024139: Nitrate is reduced to nitrite.
024140: Nitrite is reduced to nitrogen gas.
024149: Thiosulfate is reduced to hydrogen sulfide.
024154: Hydrogen sulfide is produced from cysteine.
024164: Hydrogen peroxide is decomposed.
024185: Methyl red test is positive.
024191: Voges-Proskauer test positive (also see question 35).
024199: Sheep blood hemolysis is beta.
024210: Nitrite is reduced.
024212: L-Arginine utilization results in basic endproducts (medium becomes alkaline).
024248: Kovacs' oxidase test positive (smear from colony turns dark purple with tetramethylparaphenylenediamine dihydrochloride).
024251: Hydrogen sulfide is produced from peptones.
024448: Nitrite is reduced to nitrous oxide.
024449: Nitrate is reduced to nitric oxide.
025007: L-Arabinose is utilized.
025010: D-Ribose is utilized.
025012: D-Xylose is utilized.
025017: L-Rhamnose is utilized.

025019: D-Fructose is utilized.
025020: D-Galactose is utilized.
025021: D-Glucose is utilized (also see Section 24).
025022: D-Mannose is utilized.
025023: L-Sorbose is utilized.
025036: Salicin is utilized.
025037: Cellobiose is utilized.
025038: Lactose is utilized.
025039: Maltose is utilized.
025041: Sucrose is utilized.
025042: Trehalose is utilized.
025044: Raffinose is utilized.
025053: Alginic Acid is utilized.
025184: Acid produced from D-Ribose.
025193: Acid produced from D-Fructose.
025194: Acid produced from D-Galactose.
025195: Acid produced from D-Glucose (also see Section 24).
025196: Acid produced from D-Mannose.
025211: Acid produced from Cellobiose.
025212: Acid produced from Lactose.
025213: Acid produced from Maltose.
025215: Acid produced from Sucrose.
025216: Acid produced from Trehalose.
025242: Gas produced from D-Ribose.
025251: Gas produced from D-Fructose.
025252: Gas produced from D-Galactose.
025253: Gas produced from D-Glucose (also see Section 24).
025254: Gas produced from D-Mannose.
025269: Gas produced from Cellobiose.
025270: Gas produced from Lactose.
025271: Gas produced from Maltose.
025273: Gas produced from Sucrose.
025274: Gas produced from Trehalose.
025300: D-Ribose can be used as the sole source of carbon.
025309: D-Fructose can be used as the sole source of carbon.
025311: D-Glucose can be used as the sole source of carbon (also
025312: Mannose can serve as the sole source of carbon.
see Section 24).
025351: Cellulose is hydrolyzed.
025352: Chitin is hydrolyzed.
025357: Starch is hydrolyzed.
026002: Allyl Alcohol is utilized.
026003: 1-Butanol is utilized.
026005: Ethanol is utilized.
026014: 1-Propanol is utilized.
026015: 2-Propanol is utilized.
026039: D(-) 1,2-Propanediol is utilized.
026045: 1,2,3-Propanetriol (Glycerol) is utilized.
026052: D-Arabitol is utilized.
026057: Dulcitol is utilized.
026065: D-Mannitol is utilized.
026068: D-Sorbitol is utilized.
026075: Cyclohexanol is utilized.
026079: Meso-Inositol is utilized.
026089: Phenol is utilized.
026351: Acid is produced from 1,2,3-Propanetriol (Glycerol).
026363: Acid is produced from Dulcitol.
026371: Acid is produced from D-Mannitol.
026453: Gas is produced from 1,2,3-Propanetriol (Glycerol).
026465: Gas is produced from Dulcitol.
026473: Gas is produced from D-Mannitol.

026555: 1,2,3-Propanetriol (Glycerol) can be used as the sole source of carbon.
026625: 2-Phenylethanol is utilized.
026631: 1-Hexadecanol is utilized.
028002: Acetic acid is utilized.
028003: Butyric acid is utilized.
028004: Caproic acid is utilized.
028005: Caprylic acid is utilized.
028008: Isovaleric acid is utilized.
028009: Lauric acid is utilized.
028011: Palmitic acid is utilized.
028013: Propionic acid is utilized.
028016: Valeric acid (pentanoic acid) is utilized.
028021: Glutaric acid is utilized.
028022: Malonic acid is utilized.
028027: Succinic acid is utilized.
028037: Oleic acid is utilized.
028045: Fumaric acid is utilized.
028046: Itaconic acid is utilized.
028047: Maleic acid is utilized.
028052: DL-Glyceric acid is utilized.
028054: Beta-hydroxybutyric acid is utilized.
028057: DL-Lactic acid is utilized.
028061: Mucic acid is utilized.
028064: L(+) Tartaric acid is utilized.
028066: Citric acid is utilized.
028068: 2-Ketogluconic acid is utilized.
028071: Pyruvic acid is utilized.
028072: Alpha-ketoglutaric acid is utilized.
028078: Benzoic acid is utilized.
028079: Meta-Hydroxybenzoic acid is utilized.
028080: Para-Hydroxybenzoic acid is utilized.
028097: Ascorbic acid is utilized.
028099: Galacturonic acid is utilized.
028101: D-Gluconic acid is utilized.
028105: Ortho-Hydroxybenzoic acid is utilized.
028107: Saccharic acid acid is utilized.
028109: Acetic acid can be used as the sole source of carbon.
028134: Succinic acid can be used as the sole source of carbon.
028152: Fumaric acid can be used as the sole source of carbon.
028161: Beta-hydroxybutyric acid can be used as the sole source of carbon.
028164: DL-Lactic acid can be used as the sole source of carbon.
028178: Pyruvic acid can be used as the sole source of carbon.
028179: Alpha-ketoglutaric acid can be used as the sole source of carbon.
028208: D-Gluconic acid can be used as the sole source of carbon.
028662: Stearic acid is utilized.
028668: Cyclohexane carboxylic acid is utilized.
029003: L-Alanine is utilized.
029004: Beta-Alanine is utilized.
029008: Gamma-Aminobutyric Acid is utilized.
029013: L-Arginine is utilized.
029015: L-Asparagine is utilized.
029016: L-Aspartic Acid is utilized.
029017: Betaine is utilized.
029020: L-Cysteine is utilized.
029021: L-Cystine is utilized.
029023: L-Glutamic Acid is utilized.
029024: Glycine is utilized.
029025: Hippurate is utilized.

029026: L-Histidine is utilized.
029030: L-Leucine is utilized.
029032: L-Iso-Leucine is utilized.
029035: L-Lysine is utilized.
029036: L-Methionine is utilized.
029037: L-Ornithine is utilized.
029039: L-Phenylalanine is utilized.
029041: L-Proline is utilized.
029042: Sarcosine is utilized.
029044: L-Serine is utilized.
029045: L-Threonine is utilized.
029047: L-Tryptophan is utilized.
029049: L-Tyrosine is utilized.
029051: L-Valine is utilized.
029118: L-Aspartic Acid can be used as the sole source of carbon.
029125: L-Glutamic Acid can be used as the sole source of carbon.
029137: L-Lysine can be used as the sole source of carbon.
029149: L-Tryptophan can be used as the sole source of carbon.
029156: L-Alanine can be used as the sole source of nitrogen.
029166: L-Arginine can be used as the sole source of nitrogen.
029168: L-Asparagine can be used as the sole source of nitrogen.
029169: L-Aspartic Acid can be used as the sole source of nitrogen.
029173: L-Cysteine can be used as the sole source of nitrogen.
029174: L-Cystine can be used as the sole source of nitrogen.
029176: L-Glutamic Acid can be used as the sole source of nitrogen.
029177: Glycine can be used as the sole source of nitrogen.
029179: L-Histidine can be used as the sole source of nitrogen.
029183: L-Leucine can be used as the sole source of nitrogen.
029185: L-Iso-Leucine can be used as the sole source of nitrogen.
029188: L-Lysine can be used as the sole source of nitrogen.
029189: L-Methionine can be used as the sole source of nitrogen.
029192: L-Phenylalanine can be used as the sole source of nitrogen.
029194: L-Proline can be used as the sole source of nitrogen.
029197: L-Serine can be used as the sole source of nitrogen.
029198: L-Threonine can be used as the sole source of nitrogen.
029200: L-Tryptophan can be used as the sole source of nitrogen.
029202: L-Tyrosine can be used as the sole source of nitrogen.
029204: L-Valine can be used as the sole source of nitrogen.
029294: L-Phenylalanine is deaminated.
029302: L-Tryptophan is deaminated.
029319: L-Arginine is decarboxylated.
029341: L-Lysine is decarboxylated.
029343: L-Ornithine is decarboxylated.
029620: DL-Carnitine is utilized.
030003: Alpha-Amylamine is utilized.
030012: Ethanolamine is utilized.
030015: Histamine is utilized.
030025: Putrescine is utilized.
030028: Tryptamine is utilized.
030031: Allantoin is utilized.
030144: Ethanolamine can be used as the sole source of nitrogen.
030147: Histamine can be used as the sole source of nitrogen.
030162: Allantoin can be used as the sole source of nitrogen.
030377: N-Acetylglucoseamine is utilized.
030399: Guanine is utilized.
030401: Guanine can be used as the sole source of nitrogen.
030413: Thymine is utilized.
030415: Thymine can be used as the sole source of nitrogen.
030474: Taurine is utilized.
031093: Cyclohexanone can be used as the sole source of carbon.
031101: N-Decane is utilized.

Table III (cont'd)

031102: N-Docosane is utilized.
031103: N-Dodecane is utilized.
031104: N-Eicosane is utilized.
031106: N-Heptadecane is utilized.
031107: N-Heptane is utilized.
031108: N-Hexadecane is utilized.
031111: N-Nonadecane is utilized.
031112: N-Nonane is utilized.
031113: N-Octadecane is utilized.
031114: N-Octane is utilized.
031115: N-Pentadecane is utilized.
031118: N-Tetradecane is utilized.
031119: N-Tridecane is utilized.
031120: N-Undecane is utilized.
031127: 3-Methyl Hexane is utilized.
031136: Cyclohexane is utilized.
031137: Cis-Decalin is utilized.
031144: 1-Octadecene is utilized.
031158: Anthracene is utilized.
031160: N-Butylbenzene is utilized.
031161: P-Cymene is utilized.
031162: N-Dodecylbenzene is utilized.
031163: Ethylbenzene is utilized.
031165: 2-Methylnapththalene is utilized.
031166: 1-Methylnapththalene is utilized.
031169: Naphthalene is utilized.
031171: Phenanthrene is utilized.
031172: Omega-Phenyldecane is utilized.
031174: 3-Phenyleicosane is utilized.
031175: Omega-Phenyloctadecane is utilized.
031176: Pseudocumene is utilized.
031178: Toluene is utilized.
031179: Xylene is utilized.
031590: Pristane (2,6,10,14-Tetra-methylpentadecane) is utilized.
031602: Pentadecylcyclohexane is utilized.
031608: N-Triacontane is utilized.
031614: N-Dotriacontane is utilized.
031620: N-Hexatriacontane is utilized.
031626: 2-Methylbutane is utilized.
031632: 2,2,4-Trimethylpentane is utilized.
031638: 2,2,4,4,6,8,8-Heptamethylnonane is utilized.
031644: 2-Methylundecane is utilized.
031650: Methylcyclohexane is utilized.
031656: Methylcyclopentane is utilized.
031662: 1,2-Dimethylcyclohexane is utilized.
031668: 1,4-Dimethylcyclohexane is utilized.
031674: Ethylcyclohexane is utilized.
031680: Octylcyclohexane is utilized.
031686: Dicyclohexyl is utilized.
031692: 4-Tert Butylbenzene is utilized.
031698: 1,2,3,4-Tetramethylbenzene (prehnitene) is utilized.
031704: 1-Phenyltridecane is utilized.
031710: Diphenylmethane is utilized.
031716: 1,3,5-Triphenylbenzene is utilized.
031722: 2-Ethylnaphthalene is utilized.
031728: 2,3-Dimethylnaphthalene is utilized.
031734: 2,6-Dimethylnaphthalene is utilized.
031740: 1,2,3,4-Tetrahydronaphthalene is utilized.
031746: Acenaphthalene is utilized.
031752: 9-Methylanthracene is utilized.
031758: 1-Methylphenanthrene is utilized.

031764: N-Tetracosane is utilized.
031770: 1-Pentadecene is utilized.
031776: 2,2,4,6,6-Pentamethylheptane is utilized.
031782: 1-Phenylheptane is utilized.
031788: N-Octocosane is utilized.
031794: 2,2,4,6,6-Pentamethyl-3-heptene is utilized.
031800: 1-Phenyl-3,4 dihydronaphthalene is utilized.
031806: 1-Phenylnaphthalene is utilized.
031812: 1-Phenyl-1-cyclohexene is utilized.
031818: Chrysene (1,2-Benzphenanthrene) is utilized.
031824: Pyrene (Benzo-phenanthrene) is utilized.
031830: Triphenylene (9,10 Benzphenanthrene) is utilized.
031836: Isopropylcyclohexane is utilized.
032020: Tween 20 is hydrolyzed.
032023: Tween 80 is hydrolyzed.
034137: Alkaline phosphatase (3.1.3.1) is produced.
034143: Urease (3.5.1.5) is produced.
040331: Sensitive to oxytetracycline (tetramycin, terramycin) concentration (disc) 5 ugm.
098001: Non-diffusible pink pigments are produced.
098002: D-Ribose is utilized when yeast extract and amino acids are added.
098003: D-Glucose is utilized when yeast extract and amino acids are added.
098004: D-Fructose is utilized when yeast extract and amino acids are added.
098005: D-Gluconate is utilized when yeast extract and amino acids are added.
098006: Pyruvate is utilized when yeast extract and amino acids are added.
098007: Acetate is utilized when yeast extract and amino acids are added.
098008: Succinate is utilized when yeast extract and amino acids are added.
098009: Lactate is utilized when yeast extract and amino acids added.
098010: Alpha-Ketoglutarate is utilized when yeast extract and amino acids are added.
098011: Glycerol is utilized when yeast extract and amino acids are added.
098012: Beta-Hydroxybutyrate is utilized when yeast extract and amino acids are added.
098013: L-Aspartate is utilized when yeast extract and amino acids are added.
098014: L-Glutamate is utilized when yeast extract and amino acids ARE ADDED.
098015: L-Tryptophan is utilized when yeast extract and amino acids are utilized.
098016: L-Lysine is utilized when yeast extract and amino acids are utilized.
098017: Peptone is utilized.
098018: Proteose peptone #3 is utilized.
098019: Tryptone is utilized.
098020: Phytone is utilized.
098021: Peptone is utilized when yeast extract and amino acids are added.
098022: Proteose peptone #3 is utilized when yeast extract and amino acids are added.
098023: Tryptone is utilized when yeast extract and amino acids are utilized.
098024: Peptone can serve as sole source of carbon.

098025: Proteose peptone #3 can serve as sole source of carbon.
098026: Tryptone can sere as sole source of carbon.
098027: Unknown growth factors are required.
098028: Yeast extract plus amino acids plus vitamins serve as growth factors.
098029: Vitamins can serve as growth factor.

Table IV

LITERATURE REVIEW

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Table IV (cont'd)

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Table V

NUTRIENT ANALYSES

SAMPLE NO.	PO_4-P	NH3-N	NO3-N	SIO2-SI
WATER				
BW00042?03	05.92	00.6	01.5	010.0
BW00008?03	04.86	00.6	01.1	007.0
BW00043?03	05.49	00.5	00.9	009.0
BW00002?03	09.16	00.3	02.0	007.0
BW00003?03	00.69	00.4	01.2	007.0
BW00019?03	08.36	01.8	01.3	013.0
BW00035?03	03.54	00.4	00.6	005.0
BW00020?03	04.12	00.5	01.5	008.0
BW00036?03	04.03	00.4	00.6	006.0
BW00009?03	01.02	00.5	10.0	040.0
BW00021?03	02.74	00.4	01.1	005.0
BW00037?03	05.65	00.8	01.9	009.0
BW00010?03	03.05	00.6	03.2	015.0
BW00022?03	04.81	00.3	01.0	007.0
BW00041?03	04.29	00.3	04.6	016.0
BW00006?03	04.76	02.0	01.5	006.0
BW000 4?03	7.42	0.9	1.2	5.5
BW000 7?03	3.20	0.8	1.1	6.5
BW00011?03	01.79	00.4	01.4	010.0
BW00028?03	00.49	05.2	01.3	011.0
BW00017?03	00.35	00.6	01.6	019.0
BW00013?03	00.39	00.9	02.7	017.0
BW00029?03	00.78	02.2	00.6	012.0
BW00014?03	00.55	00.2	01.1	017.0
BW00023?03	00.63	00.4	01.1	015.0
BW00018?03	00.43	00.6	01.2	018.0
BW00015?03	01.12	00.5	01.1	010.0
BW00016?03	00.43	00.6	01.7	019.0
BW00024?03	00.33	00.4	01.1	014.0
BW00025?03	01.39	00.1	00.6	011.0
BW00030?03	01.19	00.2	01.2	012.0
BW00026?03	01.63	00.6	01.6	012.0
BW00031?03	02.05	00.6	01.3	012.0
BW00027?03	02.82	00.2	00.8	011.0
BW00032?03	01.55	00.6	01.4	011.0
BW00033?03	00.69	03.2	01.1	013.0
BW00034?03	00.46	00.5	01.2	012.0
SEDIMENT				
BB00001?03	03.31	00.5	01.1	004.0
BB00010?03	01.88	00.8	01.5	011.0

Table VI

DIRECT COUNT

SAMPLE NO.	COUNT	CONDITIONS
ICE		
*BW0005?04	—	
*BW0038?04	8.1E5	
*BW0039?04	1.3E6	
*BW0040?04	1.2E6	
WATER		
*BW0042?04	7.2E5	
*BW0008?04	—	
*BW0043?04	—	
*BW0001?04	—	
*BW0002?04	—	
*BW0003?04	—	
*BW0019?04	7.5E5	
*BW0035?04	3.1E5	
*BW0020?04	5.8E5	
*BW0036?04	4.1E5	
*BW0009?04	5.4E5	
*BW0021?04	—	
*BW0037?04	3.4E5	
*BW0010?04	1.4E6	
*BW0022?04	2.1E5	
*BW0041?04	1.1E6	
*BW0006?04	—	
*BW0004?04	—	
*BW0007?04	—	
*BW0011?04	2.3E6	
*BW0012?04	1.4E6	
*BW0028?04	4.9E5	
*BW0017?04	1.0E6	
*BW0013?04	5.6E5	
*BW0029?04	2.3E5	
*BW0014?04	7.6E5	
*BW0023?04	6.8E5	
*BW0018?04	7.1E5	
*BW0015?04	4.1E6	
*BW0016?04	8.7E5	
*BW0024?04	4.2E5	
*BW0025?04	5.9E5	
*BW0030?04	6.7E5	
*BW0026?04	4.1E5	
*BW0031?04	2.4E5	
*BW0027?04	3.8E5	
*BW0032?04	4.3E5	
*BW0033?04	7.4E5	
*BW0034?04	1.2E6	

Table VI (cont'd)

SEDIMENT	
*BB00001?04	—
*BB00002?04	—
*BB00015?04	5.5E6
*BB00031?04	2.5E7
*BB00016?04	4.8E8
*BB00032?04	9.3E7
*BB00007?04	—
*BB00017?04	5.9E7
*BB00008?04	—
*BB00018?04	3.0E8
*BB00033?04	1.9E7
*BB00003?04	—
*BB00005?04	—
*BB00004?04	—
*BB00006?04	—
*BB00009?04	—
*BB00010?04	—
*BB00023?04	9.2E7
*BB00013?04	1.4E7
*BB00024?04	5.2E7
*BB00025?04	2.6E7
*BB00011?04	5.7E6
*BB00019?04	3.1E7
*BB00014?04	5.1E6
*BB00012?04	9.7E6
*BB00020?04	7.3E6
*BB00026?04	4.1E7
*BB00021?04	3.7E7
*BB00027?04	1.7E7
*BB00022?04	9.2E7
*BB00028?04	2.3E6
*BB00029?04	1.1E7
*BB00030?04	1.7E7

Table VII

AEROBIC HETEROTROPHIC PSYCHROPHILES AND PSYCHROTROPHS

SAMPLE NO.	COUNT	CONDITIONS
ICE		
*BW0005?05	6.0E2	04C AEROBIC S MARINE 2216
*BW0038?05	5.3E3	04C AEROBIC S MARINE 2216
*BW0039?05	2.3E4	04C AEROBIC S MARINE 2216
*BW0040?05	3.1E2	04C AEROBIC S MARINE 2216
WATER		
*BW0042?05	9.8E2	04C AEROBIC S MARINE 2216
*BW0008?05	7.7E2	04C AEROBIC S MARINE 2216
*BW0043?05	1.7E3	04C AEROBIC S MARINE 2216
*BW0001?05	1.9E2	04C AEROBIC S MARINE 2216
*BW0002?05	7.0E1	04C AEROBIC S MARINE 2216
*BW0003?05	4.8E3	04C AEROBIC S MARINE 2216
*BW0019?05	6.1E3	04C AEROBIC S MARINE 2216
*BW0035?05	3.5E3	04C AEROBIC S MARINE 2216
*BW0020?05	3.1E3	04C AEROBIC S MARINE 2216
*BW0036?05	1.4E3	04C AEROBIC S MARINE 2216
*BW0009?05	8.4E2	04C AEROBIC S MARINE 2216
*BW0021?05	5.1E3	04C AEROBIC S MARINE 2216
*BW0037?05	7.1E2	04C AEROBIC S MARINE 2216
*BW0010?05	1.5E3	04C AEROBIC S MARINE 2216
*BW0022?05	1.3E3	04C AEROBIC S MARINE 2216
*BW0041?05	2.3E3	04C AEROBIC S MARINE 2216
*BW0006?05	4.0E3	04C AEROBIC S MARINE 2216
*BW0004?05	1.8E4	04C AEROBIC S MARINE 2216
*BW0007?05	2.4E3	04C AEROBIC S MARINE 2216
*BW0011?05	1.0E4	04C AEROBIC S MARINE 2216
*BW0012?05	6.7E3	04C AEROBIC S MARINE 2216
*BW0026?05	2.5E4	04C AEROBIC S MARINE 2216
*BW0017?05	2.6E4	04C AEROBIC S MARINE 2216
*BW0013?05	1.0E4	04C AEROBIC S MARINE 2216
*BW0029?05	2.9E4	04C AEROBIC S MARINE 2216
*BW0014?05	1.8E4	04C AEROBIC S MARINE 2216
*BW0023?05	2.7E4	04C AEROBIC S MARINE 2216
*BW0018?05	1.8E4	04C AEROBIC S MARINE 2216
*BW0015?05	2.2E4	04C AEROBIC S MARINE 2216
*BW0016?05	1.6E4	04C AEROBIC S MARINE 2216
*BW0024?05	2.1E4	04C AEROBIC S MARINE 2216
*BW0025?05	1.4E4	04C AEROBIC S MARINE 2216
*BW0030?05	1.9E4	04C AEROBIC S MARINE 2216
*BW0028?05	9.6E3	04C AEROBIC S MARINE 2216
*BW0031?05	9.2E3	04C AEROBIC S MARINE 2216
*BW0027?05	9.7E3	04C AEROBIC S MARINE 2216
*BW0032?05	5.9E3	04C AEROBIC S MARINE 2216
*BW0033?05	1.8E4	04C AEROBIC S MARINE 2216
*BW0034?05	2.3E4	04C AEROBIC S MARINE 2216

Table VII (cont'd)

SEDIMENT

*BB00001?05	1.0E4	04C	AEROBIC	S	MARINE	2216
*BB00002?05	5.4E4	04C	AEROBIC	S	MARINE	2216
*BB00015?05	2.2E5	04C	AEROBIC	S	MARINE	2216
*BB00031?05	1.0E5	04C	AEROBIC	S	MARINE	2216
*BB00016?05	1.3E5	04C	AEROBIC	S	MARINE	2216
*BB00032?05	1.1E5	04C	AEROBIC	S	MARINE	2216
*BB00007?05	1.9E5	04C	AEROBIC	S	MARINE	2216
*BB00017?05	—	04C	AEROBIC	S	MARINE	2216
*BB00008?05	7.8E5	04C	AEROBIC	S	MARINE	2216
*BB00018?05	2.4E5	04C	AEROBIC	S	MARINE	2216
*BB00033?05	6.5E3	04C	AEROBIC	S	MARINE	2216
*BB00003?05	5.3E4	04C	AEROBIC	S	MARINE	2216
*BB00005?05	4.5E4	04C	AEROBIC	S	MARINE	2216
*BB00004?05	6.8E5	04C	AEROBIC	S	MARINE	2216
*BB00006?05	3.1E4	04C	AEROBIC	S	MARINE	2216
*BB00009?05	8.7E4	04C	AEROBIC	S	MARINE	2216
*BB00010?05	5.4E4	04C	AEROBIC	S	MARINE	2216
*BB00023?05	1.8E6	04C	AEROBIC	S	MARINE	2216
*BB00013?05	3.4E4	04C	AEROBIC	S	MARINE	2216
*BB00024?05	6.8E4	04C	AEROBIC	S	MARINE	2216
*BB00025?05	1.3E5	04C	AEROBIC	S	MARINE	2216
*BB00011?05	6.2E4	04C	AEROBIC	S	MARINE	2216
*BB00019?05	2.7E5	04C	AEROBIC	S	MARINE	2216
*BB00014?05	1.2E5	04C	AEROBIC	S	MARINE	2216
*BB00012?05	4.4E4	04C	AEROBIC	S	MARINE	2216
*BB00020?05	2.3E5	04C	AEROBIC	S	MARINE	2216
*BB00026?05	4.0E5	04C	AEROBIC	S	MARINE	2216
*BB00021?05	4.1E4	04C	AEROBIC	S	MARINE	2216
*BB00027?05	6.8E4	04C	AEROBIC	S	MARINE	2216
*BB00022?05	3.2E4	04C	AEROBIC	S	MARINE	2216
*BB00028?05	9.7E4	04C	AEROBIC	S	MARINE	2216
*BB00029?05	1.1E5	04C	AEROBIC	S	MARINE	2216
*BB00030?05	2.9E5	04C	AEROBIC	S	MARINE	2216

Table VIII

AEROBIC HETEROTROPHIC MESOPHILES

SAMPLE NO.	COUNT	CONDITIONS
ICE		
*BW0005?06	1.7E2	20C AEROBIC S MARINE 2216
*BW0038?06	1.6E3	20C AEROBIC S MARINE 2216
*BW0039?06	1.4E3	20C AEROBIC S MARINE 2216
*BW0040?06	2.0E1	20C AEROBIC S MARINE 2216
WATER		
*BW0042?06	4.1E2	20C AEROBIC S MARINE 2216
*BW0008?06	3.7E2	20C AEROBIC S MARINE 2216
*BW0043?06	3.1E2	20C AEROBIC S MARINE 2216
*BW0001?06	6.3E3	20C AEROBIC S MARINE 2216
*BW0002?06	1.5E3	20C AEROBIC S MARINE 2216
*BW0003?06	4.4E2	20C AEROBIC S MARINE 2216
*BW0019?06	6.7E3	20C AEROBIC S MARINE 2216
*BW0035?06	3.9E3	20C AEROBIC S MARINE 2216
*BW0020?06	2.2E3	20C AEROBIC S MARINE 2216
*BW0036?06	5.7E2	20C AEROBIC S MARINE 2216
*BW0009?06	3.3E2	20C AEROBIC S MARINE 2216
*BW0021?06	1.0E3	20C AEROBIC S MARINE 2216
*BW0037?06	7.4E2	20C AEROBIC S MARINE 2216
*BW0010?06	3.7E2	20C AEROBIC S MARINE 2216
*BW0022?06	1.9E2	20C AEROBIC S MARINE 2216
*BW0041?06	8.6E2	20C AEROBIC S MARINE 2216
*BW0006?06	3.2E3	20C AEROBIC S MARINE 2216
*BW0004?06	1.2E4	20C AEROBIC S MARINE 2216
*BW0007?06	8.0E2	20C AEROBIC S MARINE 2216
*BW0011?06	8.5E3	20C AEROBIC S MARINE 2216
*BW0012?06	1.6E4	20C AEROBIC S MARINE 2216
*BW0028?06	9.4E3	20C AEROBIC S MARINE 2216
*BW0017?06	1.2E4	20C AEROBIC S MARINE 2216
*BW0013?06	2.8E4	20C AEROBIC S MARINE 2216
*BW0029?06	8.8E3	20C AEROBIC S MARINE 2216
*BW0014?06	1.7E4	20C AEROBIC S MARINE 2216
*BW0023?06	2.7E4	20C AEROBIC S MARINE 2216
*BW0018?06	1.1E4	20C AEROBIC S MARINE 2216
*BW0015?06	1.3E4	20C AEROBIC S MARINE 2216
*BW0016?06	1.2E4	20C AEROBIC S MARINE 2216
*BW0024?06	1.9E4	20C AEROBIC S MARINE 2216
*BW0025?06	1.6E4	20C AEROBIC S MARINE 2216
*BW0030?06	1.5E4	20C AEROBIC S MARINE 2216
*BW0026?06	1.3E4	20C AEROBIC S MARINE 2216
*BW0031?06	6.9E3	20C AEROBIC S MARINE 2216
*BW0027?06	9.6E3	20C AEROBIC S MARINE 2216
*BW0032?06	3.3E3	20C AEROBIC S MARINE 2216
*BW0033?06	1.0E4	20C AEROBIC S MARINE 2216
*BW0034?06	1.4E4	20C AEROBIC S MARINE 2216

Table VIII (cont'd)

SEDIMENT		
*BB0001?06	3.0E3	20C AEROBIC S MARINE 2216
*BB0002?06	5.9E4	20C AEROBIC S MARINE 2216
*BB0015?06	2.5E5	20C AEROBIC S MARINE 2216
*BB0031?06	8.1E4	20C AEROBIC S MARINE 2216
*BB0016?06	5.7E4	20C AEROBIC S MARINE 2216
*BB0032?06	1.1E5	20C AEROBIC S MARINE 2216
*BB0007?06	1.4E5	20C AEROBIC S MARINE 2216
*BB0017?06	1.6E4	20C AEROBIC S MARINE 2216
*BB0008?06	5.0E5	20C AEROBIC S MARINE 2216
*BB0018?06	7.7E5	20C AEROBIC S MARINE 2216
*BB0033?06	2.9E3	20C AEROBIC S MARINE 2216
*BB0003?06	1.3E4	20C AEROBIC S MARINE 2216
*BB0005?06	1.8E5	20C AEROBIC S MARINE 2216
*BB0004?06	7.7E5	20C AEROBIC S MARINE 2216
*BB0006?06	1.9E5	20C AEROBIC S MARINE 2216
*BB0009?06	2.5E5	20C AEROBIC S MARINE 2216
*BB0010?06	4.1E4	20C AEROBIC S MARINE 2216
*BB0023?06	1.5E6	20C AEROBIC S MARINE 2216
*BB0013?06	2.7E4	20C AEROBIC S MARINE 2216
*BB0024?06	3.2E5	20C AEROBIC S MARINE 2216
*BB0025?06	5.3E4	20C AEROBIC S MARINE 2216
*BB0011?06	4.5E4	20C AEROBIC S MARINE 2216
*BB0019?06	1.4E6	20C AEROBIC S MARINE 2216
*BB0014?06	1.6E5	20C AEROBIC S MARINE 2216
*BB0012?06	3.2E4	20C AEROBIC S MARINE 2216
*BB0020?06	3.6E5	20C AEROBIC S MARINE 2216
*BB0026?06	1.3E5	20C AEROBIC S MARINE 2216
*BB0021?06	4.1E4	20C AEROBIC S MARINE 2216
*BB0027?06	1.8E5	20C AEROBIC S MARINE 2216
*BB0022?06	5.2E4	20C AEROBIC S MARINE 2216
*BB0028?06	1.6E5	20C AEROBIC S MARINE 2216
*BB0029?06	2.7E5	20C AEROBIC S MARINE 2216
*BB0030?06	7.0E5	20C AEROBIC S MARINE 2216

Table IX

AEROBIC HETEROTROPHIC PSYCHROPHILES AND PSYCHROTROPHS

SAMPLE NO.	COUNT	CONDITIONS
ICE		
*BW0005?07	3.7E2	04C AEROBIC S MSWYE
*BW0038?07	4.5E3	04C AEROBIC S MSWYE
*BW0039?07	1.6E4	04C AEROBIC S MSWYE
*BW0040?07	2.0E1	04C AEROBIC S MSWYE
WATER		
*BW0042?07	2.4E3	04C AEROBIC S MSWYE
*BW0008?07	2.4E2	04C AEROBIC S MSWYE
*BW0043?07	5.1E2	04C AEROBIC S MSWYE
*BW0001?07	1.1E2	04C AEROBIC S MSWYE
*BW0002?07	3.7E1	04C AEROBIC S MSWYE
*BW0003?07	1.4E3	04C AEROBIC S MSWYE
*BW0019?07	1.8E4	04C AEROBIC S MSWYE
*BW0035?07	8.6E3	04C AEROBIC S MSWYE
*BW0020?07	8.1E3	04C AEROBIC S MSWYE
*BW0036?07	5.4E3	04C AEROBIC S MSWYE
*BW0009?07	2.5E2	04C AEROBIC S MSWYE
*BW0021?07	8.2E3	04C AEROBIC S MSWYE
*BW0037?07	4.0E3	04C AEROBIC S MSWYE
*BW0010?07	4.6E2	04C AEROBIC S MSWYE
*BW0022?07	1.7E3	04C AEROBIC S MSWYE
*BW0041?07	8.0E3	04C AEROBIC S MSWYE
*BW0006?07	9.5E2	04C AEROBIC S MSWYE
*BW0004?07	1.7E3	04C AEROBIC S MSWYE
*BW0007?07	8.1E2	04C AEROBIC S MSWYE
*BW0011?07	8.2E3	04C AEROBIC S MSWYE
*BW0012?07	8.7E3	04C AEROBIC S MSWYE
*BW0028?07	3.1E4	04C AEROBIC S MSWYE
*BW0017?07	2.2E4	04C AEROBIC S MSWYE
*BW0013?07	1.3E4	04C AEROBIC S MSWYE
*BW0029?07	3.0E4	04C AEROBIC S MSWYE
*BW0014?07	2.3E4	04C AEROBIC S MSWYE
*BW0023?07	5.9E2	04C AEROBIC S MSWYE
*BW0018?07	1.6E4	04C AEROBIC S MSWYE
*BW0015?07	3.0E4	04C AEROBIC S MSWYE
*BW0016?07	1.8E4	04C AEROBIC S MSWYE
*BW0024?07	6.9E2	04C AEROBIC S MSWYE
*BW0025?07	2.2E3	04C AEROBIC S MSWYE
*BW0030?07	1.9E4	04C AEROBIC S MSWYE
*BW0026?07	1.3E2	04C AEROBIC S MSWYE
*BW0031?07	6.5E3	04C AEROBIC S MSWYE
*BW0027?07	1.8E2	04C AEROBIC S MSWYE
*BW0032?07	2.9E3	04C AEROBIC S MSWYE
*BW0033?07	2.3E4	04C AEROBIC S MSWYE
*BW0034?07	3.0E4	04C AEROBIC S MSWYE

Table IX (cont'd)

SEDIMENT					
*BB0001?07	7.4E3	04C	AEROBIC	S	MSWYE
*BB0002?07	9.2E3	04C	AEROBIC	S	MSWYE
*BB0015?07	2.0E5	04C	AEROBIC	S	MSWYE
*BB0031?07	1.0E5	04C	AEROBIC	S	MSWYE
*BB0016?07	1.1E5	04C	AEROBIC	S	MSWYE
*BB0032?07	7.5E4	04C	AEROBIC	S	MSWYE
*BB0007?07	1.2E5	04C	AEROBIC	S	MSWYE
*BB0017?07	2.1E4	04C	AEROBIC	S	MSWYE
*BB0008?07	3.1E4	04C	AEROBIC	S	MSWYE
*BB0018?07	7.7E5	04C	AEROBIC	S	MSWYE
*BB0033?07	9.5E3	04C	AEROBIC	S	MSWYE
*BB0003?07	6.6E4	04C	AEROBIC	S	MSWYE
*BB0005?07	5.4E4	04C	AEROBIC	S	MSWYE
*BB0004?07	3.9E5	04C	AEROBIC	S	MSWYE
*BB0006?07	1.9E4	04C	AEROBIC	S	MSWYE
*BB0009?07	3.4E4	04C	AEROBIC	S	MSWYE
*BB0010?07	2.7E4	04C	AEROBIC	S	MSWYE
*BB0023?07	1.1E6	04C	AEROBIC	S	MSWYE
*BB0013?07	6.7E4	04C	AEROBIC	S	MSWYE
*BB0024?07	4.5E5	04C	AEROBIC	S	MSWYE
*BB0025?07	3.0E5	04C	AEROBIC	S	MSWYE
*BB0011?07	4.9E4	04C	AEROBIC	S	MSWYE
*BB0019?07	1.9E5	04C	AEROBIC	S	MSWYE
*BB0014?07	5.6E4	04C	AEROBIC	S	MSWYE
*BB0012?07	6.1E4	04C	AEROBIC	S	MSWYE
*BB0020?07	9.8E4	04C	AEROBIC	S	MSWYE
*BB0026?07	1.1E5	04C	AEROBIC	S	MSWYE
*BB0021?07	2.0E4	04C	AEROBIC	S	MSWYE
*BB0027?07	1.1E5	04C	AEROBIC	S	MSWYE
*BB0022?07	4.1E4	04C	AEROBIC	S	MSWYE
*BB0028?07	9.7E4	04C	AEROBIC	S	MSWYE
*BB0029?07	8.3E4	04C	AEROBIC	S	MSWYE
*BB0030?07	1.9E5	04C	AEROBIC	S	MSWYE

Table X

AEROBIC HETEROTROPHIC MESOPHILES

SAMPLE NO.	COUNT	CONDITIONS
ICE		
*BW0005?08	1.2E2	20C AEROBIC S MSWYE
*BW0038?08	1.5E3	20C AEROBIC S MSWYE
*BW0039?08	1.2E3	20C AEROBIC S MSWYE
*BW0040?08	2.0E1	20C AEROBIC S MSWYE
WATER		
*BW0042?08	7.0E2	20C AEROBIC S MSWYE
*BW0008?08	2.6E2	20C AEROBIC S MSWYE
*BW0043?08	2.7E2	20C AEROBIC S MSWYE
*BW0001?08	2.5E3	20C AEROBIC S MSWYE
*BW0002?08	7.8E2	20C AEROBIC S MSWYE
*BW0003?08	4.3E2	20C AEROBIC S MSWYE
*BW0019?08	6.0E3	20C AEROBIC S MSWYE
*BW0035?08	3.6E3	20C AEROBIC S MSWYE
*BW0020?08	2.4E3	20C AEROBIC S MSWYE
*BW0036?08	6.5E2	20C AEROBIC S MSWYE
*BW0009?08	3.0E2	20C AEROBIC S MSWYE
*BW0021?08	1.0E3	20C AEROBIC S MSWYE
*BW0037?08	7.3F2	20C AEROBIC S MSWYE
*BW0010?08	2.2E2	20C AEROBIC S MSWYE
*BW0022?08	2.8E2	20C AEROBIC S MSWYE
*BW0041?08	1.1E3	20C AEROBIC S MSWYE
*BW0006?08	8.8E2	20C AEROBIC S MSWYE
*BW0004?08	5.8E3	20C AEROBIC S MSWYE
*BW0007?08	4.7E2	20C AEROBIC S MSWYE
*BW0011?08	1.5E3	20C AEROBIC S MSWYE
*BW0012?08	1.0E3	20C AEROBIC S MSWYE
*BW0028?08	1.2E4	20C AEROBIC S MSWYE
*BW0017?08	1.3E4	20C AEROBIC S MSWYE
*BW0013?08	1.6E4	20C AEROBIC S MSWYE
*BW0029?08	1.1E4	20C AEROBIC S MSWYE
*BW0014?08	1.0E4	20C AEROBIC S MSWYE
*BW0023?08	5.8E3	20C AEROBIC S MSWYE
*BW0018?08	1.1E4	20C AEROBIC S MSWYE
*BW0015?08	1.7E4	20C AEROBIC S MSWYE
*BW0016?08	1.1E4	20C AEROBIC S MSWYE
*BW0024?08	3.8E3	20C AEROBIC S MSWYE
*BW0025?08	2.2E3	20C AEROBIC S MSWYE
*BW0030?08	8.8E3	20C AEROBIC S MSWYE
*BW0026?08	1.4E3	20C AEROBIC S MSWYE
*BW0031?08	8.1E3	20C AEROBIC S MSWYE
*BW0027?08	1.2E3	20C AEROBIC S MSWYE
*BW0032?08	4.9E3	20C AEROBIC S MSWYE
*BW0033?08	1.0E4	20C AEROBIC S MSWYE
*BW0034?08	1.4E4	20C AEROBIC S MSWYE

Table X (cont'd)

SEDIMENT					
*BB00001?08	1.4E4	20C	AEROBIC	S	MSWYE
*BB00002?08	6.8E4	20C	AEROBIC	S	MSWYE
*BB00015?08	4.3E5	20C	AEROBIC	S	MSWYE
*BB00031?08	7.8E4	20C	AEROBIC	S	MSWYE
*BB00016?08	3.6E4	20C	AEROBIC	S	MSWYE
*BB00032?08	1.2E5	20C	AEROBIC	S	MSWYE
*BB00007?08	5.0E4	20C	AEROBIC	S	MSWYE
*BB00017?08	1.3E4	20C	AEROBIC	S	MSWYE
*BB00008?08	8.1E4	20C	AEROBIC	S	MSWYE
*BB00018?08	9.4E5	20C	AEROBIC	S	MSWYE
*BB00033?08	3.8E3	20C	AEROBIC	S	MSWYE
*BB00003?08	1.8E4	20C	AEROBIC	S	MSWYE
*BB00005?08	2.3E4	20C	AEROBIC	S	MSWYE
*BB00004?08	8.6E5	20C	AEROBIC	S	MSWYE
*BB00006?08	1.6E4	20C	AEROBIC	S	MSWYE
*BB00009?08	3.3E4	20C	AEROBIC	S	MSWYE
*BB00010?08	2.6E4	20C	AEROBIC	S	MSWYE
*BB00023?08	1.7E6	20C	AEROBIC	S	MSWYE
*BB00013?08	3.6E4	20C	AEROBIC	S	MSWYE
*BB00024?08	4.0E5	20C	AEROBIC	S	MSWYE
*BB00025?08	1.5E5	20C	AEROBIC	S	MSWYE
*BB00011?08	6.2E4	20C	AEROBIC	S	MSWYE
*BB00019?08	2.5E5	20C	AEROBIC	S	MSWYE
*BB00014?08	3.4E4	20C	AEROBIC	S	MSWYE
*BB00012?08	4.1E4	20C	AEROBIC	S	MSWYE
*BB00020?08	4.7E5	20C	AEROBIC	S	MSWYE
*BB00026?08	7.3E5	20C	AEROBIC	S	MSWYE
*BB00021?08	8.1E4	20C	AEROBIC	S	MSWYE
*BB00027?08	1.3E5	20C	AEROBIC	S	MSWYE
*BB00022?08	5.8E4	20C	AEROBIC	S	MSWYE
*BB00028?08	8.8E4	20C	AEROBIC	S	MSWYE
*BB00029?08	2.0E5	20C	AEROBIC	S	MSWYE
*BB00030?08	5.3E5	20C	AEROBIC	S	MSWYE

Table XI

PSYCHROPHILIC AND PSYCHROTROPHIC "FUNGI"

SAMPLE NO.	COUNT	CONDITIONS
ICE		
*BW0005?15	6.4E2	04C AEROBIC S SDA
*BW0038?15	6.5E0	04C AEROBIC S SDA
*BW0039?15	2.0E2	04C AEROBIC S SDA
*BW0040?15	2.0E1	04C AEROBIC S SDA
WATER		
*BW0042?15	1.5E0	04C AEROBIC S SDA
*BW0008?15	1.1E0	04C AEROBIC S SDA
*BW0043?15	1.6E0	04C AEROBIC S SDA
*BW0001?15	3.6E1	04C AEROBIC S SDA
*BW0002?15	3.6E1	04C AEROBIC S SDA
*BW0003?15	<1.0E1	04C AEROBIC S SDA
*BW0019?15	4.1E0	04C AEROBIC S SDA
*BW0035?15	1.0E2	04C AEROBIC S SDA
*BW0020?15	1.0E1	04C AEROBIC S SDA
*BW0036?15	2.4E0	04C AEROBIC S SDA
*BW0009?15	5.0E0	04C AEROBIC S SDA
*BW0021?15	0.9E0	04C AEROBIC S SDA
*BW0037?15	3.3E0	04C AEROBIC S SDA
*BW0010?15	3.0E0	04C AEROBIC S SDA
*BW0022?15	3.0E0	04C AEROBIC S SDA
*BW0041?15	0.6E0	04C AEROBIC S SDA
*BW0006?15	1.0E1	04C AEROBIC S SDA
*BW0004?15	<1.0E1	04C AEROBIC S SDA
*BW0007?15	0.4E0	04C AEROBIC S SDA
*BW0011?15	5.2E0	04C AEROBIC S SDA
*BW0012?15	1.1E0	04C AEROBIC S SDA
*BW0028?15	0.1E0	04C AEROBIC S SDA
*BW0017?15	1.3E0	04C AEROBIC S SDA
*BW0013?15	1.0E0	04C AEROBIC S SDA
*BW0029?15	0.1E0	04C AEROBIC S SDA
*BW0014?15	1.4E0	04C AEROBIC S SDA
*BW0023?15	0.1E0	04C AEROBIC S SDA
*BW0018?15	2.0E0	04C AEROBIC S SDA
*BW0015?15	1.7E0	04C AEROBIC S SDA
*BW0016?15	2.4E0	04C AEROBIC S SDA
*BW0024?15	1.2E0	04C AEROBIC S SDA
*BW0025?15	0.9E0	04C AEROBIC S SDA
*BW0030?15	<1.0E-1	04C AEROBIC S SDA
*BW0026?15	1.4E0	04C AEROBIC S SDA
*BW0031?15	0.3E0	04C AEROBIC S SDA
*BW0027?15	1.3E0	04C AEROBIC S SDA
*BW0032?15	4.6E0	04C AEROBIC S SDA
*BW0033?15	0.2E0	04C AEROBIC S SDA
*BW0034?15	0.2E0	04C AEROBIC S SDA

Table XI (cont'd)

SEDIMENT					
*BB0001?15	1.4E1	04C	AEROBIC	S	SDA
*BB0002?15	1.1E1	04C	AEROBIC	S	SDA
*BB0015?15	1.0E1	04C	AEROBIC	S	SDA
*BB0031?15	1.4E1	04C	AEROBIC	S	SDA
*BB0016?15	1.2E2	04C	AEROBIC	S	SDA
*BB0032?15	1.0E2	04C	AEROBIC	S	SDA
*BB0007?15	9.0E1	04C	AEROBIC	S	SDA
*BB0017?15	2.7E2	04C	AEROBIC	S	SDA
*BB0008?15	6.7E2	04C	AEROBIC	S	SDA
*BB0018?15	2.4E3	04C	AEROBIC	S	SDA
*BB0033?15	2.6E1	04C	AEROBIC	S	SDA
*BB0003?15	4.4E0	04C	AEROBIC	S	SDA
*BB0005?15	4.5E0	04C	AEROBIC	S	SDA
*BB0004?15	4.4E0	04C	AEROBIC	S	SDA
*BB0006?15	3.7E0	04C	AEROBIC	S	SDA
*BB0009?15	3.3E1	04C	AEROBIC	S	SDA
*BB0010?15	5.8E1	04C	AEROBIC	S	SDA
*BB0023?15	1.6E2	04C	AEROBIC	S	SDA
*BB0013?15	1.1E2	04C	AEROBIC	S	SDA
*BB0024?15	5.0E1	04C	AEROBIC	S	SDA
*BB0025?15	2.8E1	04C	AEROBIC	S	SDA
*BB0011?15	6.5E3	04C	AEROBIC	S	SDA
*BB0019?15	1.3E2	04C	AEROBIC	S	SDA
*BB0014?15	3.4E1	04C	AEROBIC	S	SDA
*BB0012?15	1.3E2	04C	AEROBIC	S	SDA
*BB0020?15	9.5E1	04C	AEROBIC	S	SDA
*BB0026?15	6.4E1	04C	AEROBIC	S	SDA
*BB0021?15	4.6E1	04C	AEROBIC	S	SDA
*BB0027?15	3.1E1	04C	AEROBIC	S	SDA
*BB0022?15	1.6E2	04C	AEROBIC	S	SDA
*BB0028?15	5.4E1	04C	AEROBIC	S	SDA
*BB0029?15	1.0E2	04C	AEROBIC	S	SDA
*BB0030?15	3.3E1	04C	AEROBIC	S	SDA

Table XII

MESOPHILIC "FUNGI"

SAMPLE NO.	COUNT	CONDITIONS
ICE		
*BW0005?16	1.0E2	20C AEROBIC S SDA
*BW0038?16	1.0E1	20C AEROBIC S SDA
*BW0039?16	5.0E1	20C AEROBIC S SDA
*BW0040?16	3.6E0	20C AEROBIC S SDA
WATER		
*BW0042?16	0.8E0	20C AEROBIC S SDA
*BW0008?16	6.0E0	20C AEROBIC S SDA
*BW0043?16	0.3E0	20C AEROBIC S SDA
*BW0001?16	5.9E1	20C AEROBIC S SDA
*BW0002?16	—	20C AEROBIC S SDA
*BW0003?16	<1.0E1	20C AEROBIC S SDA
*BW0019?16	4.1E1	20C AEROBIC S SDA
*BW0035?16	7.0E0	20C AEROBIC S SDA
*BW0020?16	2.4E1	20C AEROBIC S SDA
*BW0036?16	1.0E1	20C AEROBIC S SDA
*BW0009?16	3.5E1	20C AEROBIC S SDA
*BW0021?16	1.9E1	20C AEROBIC S SDA
*BW0037?16	1.1E0	20C AEROBIC S SDA
*BW0010?16	1.0E1	20C AEROBIC S SDA
*BW0022?16	3.0E0	20C AEROBIC S SDA
*BW0041?16	0.5E0	20C AEROBIC S SDA
*BW0006?16	1.0E2	20C AEROBIC S SDA
*BW0004?16	—	20C AEROBIC S SDA
*BW0007?16	1.2E2	20C AEROBIC S SDA
*BW0011?16	2.0E1	20C AEROBIC S SDA
*BW0012?16	1.2E1	20C AEROBIC S SDA
*BW0028?16	1.4E0	20C AEROBIC S SDA
*BW0017?16	1.6E1	20C AEROBIC S SDA
*BW0013?16	5.0E1	20C AEROBIC S SDA
*BW0029?16	3.1E0	20C AEROBIC S SDA
*BW0014?16	1.2E1	20C AEROBIC S SDA
*BW0023?16	2.0E0	20C AEROBIC S SDA
*BW0018?16	5.1E0	20C AEROBIC S SDA
*BW0015?16	1.0E1	20C AEROBIC S SDA
*BW0016?16	5.6E1	20C AEROBIC S SDA
*BW0024?16	1.0E0	20C AEROBIC S SDA
*BW0025?16	4.0E0	20C AEROBIC S SDA
*BW0030?16	0.3E0	20C AEROBIC S SDA
*BW0026?16	<1.0E0	20C AEROBIC S SDA
*BW0031?16	0.6E0	20C AEROBIC S SDA
*BW0027?16	1.0E0	20C AEROBIC S SDA
*BW0032?16	1.2E1	20C AEROBIC S SDA
*BW0033?16	0.4E0	20C AEROBIC S SDA
*BW0034?16	0.3E0	20C AEROBIC S SDA

Table XII (cont'd)

SEDIMENT					
*BB00001?16	1.4E1	20C	AEROBIC	S	SDA
*BB00002?16	1.1E1	20C	AEROBIC	S	SDA
*BB00015?16	1.0E3	20C	AEROBIC	S	SDA
*BB00031?16	3.4E2	20C	AEROBIC	S	SDA
*BB00016?16	7.2E1	20C	AEROBIC	S	SDA
*BB00032?16	2.6E2	20C	AEROBIC	S	SDA
*BB00007?16	8.7E1	20C	AEROBIC	S	SDA
*BB00017?16	2.3E2	20C	AEROBIC	S	SDA
*BB00008?16	6.5E1	20C	AEROBIC	S	SDA
*BB00018?16	4.7E2	20C	AEROBIC	S	SDA
*BB00033?16	8.6E1	20C	AEROBIC	S	SDA
*BB00003?16	4.4E0	20C	AEROBIC	S	SDA
*BB00005?16	9.0E1	20C	AEROBIC	S	SDA
*BB00004?16	4.2E2	20C	AEROBIC	S	SDA
*BB00006?16	3.7E1	20C	AEROBIC	S	SDA
*BB00009?16	6.0E1	20C	AEROBIC	S	SDA
*BB00010?16	5.4E1	20C	AEROBIC	S	SDA
*BB00023?16	1.1E2	20C	AEROBIC	S	SDA
*BB00013?16	7.1E1	20C	AEROBIC	S	SDA
*BB00024?16	1.2E2	20C	AEROBIC	S	SDA
*BB00025?16	6.0E1	20C	AEROBIC	S	SDA
*BB00011?16	1.4E4	20C	AEROBIC	S	SDA
*BB00019?16	2.1E2	20C	AEROBIC	S	SDA
*BB00014?16	6.2E1	20C	AEROBIC	S	SDA
*BB00012?16	1.7E2	20C	AEROBIC	S	SDA
*BB00020?16	3.8E2	20C	AEROBIC	S	SDA
*BB00026?16	1.4E2	20C	AEROBIC	S	SDA
*BB00021?16	9.3E1	20C	AEROBIC	S	SDA
*BB00027?16	6.2E1	20C	AEROBIC	S	SDA
*BB00022?16	4.4E1	20C	AEROBIC	S	SDA
*BB00028?16	7.2E1	20C	AEROBIC	S	SDA
*BB00029?16	6.8E1	20C	AEROBIC	S	SDA
*BB00030?16	2.0E2	20C	AEROBIC	S	SDA

Table XIII

PSEUDOMONADS

SAMPLE NO.	COUNT	CONDITIONS
ICE		
*BW0005?12	2.9E3	20C AEROBIC M PSEUDOSEL
*BW0038?12	<1.0E-1	20C AEROBIC M PSEUDOSEL
*BW0039?12	<1.0E-1	20C AEROBIC M PSEUDOSEL
*BW0040?12	<1.0E-1	20C AEROBIC M PSEUDOSEL
WATER		
*BW0042?12	6.0E0	20C AEROBIC M PSEUDOSEL
*BW0008?12	<1.0E-1	20C AEROBIC M PSEUDOSEL
*BW0043?12	<1.0E-1	20C AEROBIC M PSEUDOSEL
*BW0001?12	1.6E1	20C AEROBIC M PSEUDOSEL
*BW0002?12	2.0E1	20C AEROBIC M PSEUDOSEL
*BW0003?12	<1.0E-1	20C AEROBIC M PSEUDOSEL
*BW0019?12	<1.0E-1	20C AEROBIC M PSEUDOSEL
*BW0035?12	1.0	20C AEROBIC M PSEUDOSEL
*BW0020?12	<1.0E-1	20C AEROBIC M PSEUDOSEL
*BW0036?12	<1.0E-1	20C AEROBIC M PSEUDOSEL
*BW0009?12	4.0E0	20C AEROBIC M PSEUDOSEL
*BW0021?12	<1.0E-1	20C AEROBIC M PSEUDOSEL
*BW0037?12	<1.0E-1	20C AEROBIC M PSEUDOSEL
*BW0010?12	1.0E0	20C AEROBIC M PSEUDOSEL
*BW0022?12	1.0E0	20C AEROBIC M PSEUDOSEL
*BW0041?12	<1.0E-1	20C AEROBIC M PSEUDOSEL
*BW0006?12	<1.0E-1	20C AEROBIC M PSEUDOSEL
*BW0004?12	1.7E1	20C AEROBIC M PSEUDOSEL
*BW0007?12	3.0E0	20C AEROBIC M PSEUDOSEL
*BW0011?12	3.0E0	20C AEROBIC M PSEUDOSEL
*BW0012?12	1.0E0	20C AEROBIC M PSEUDOSEL
*BW0028?12	<1.0E-1	20C AEROBIC M PSEUDOSEL
*BW0017?12	3.0E0	20C AEROBIC M PSEUDOSEL
*BW0013?12	1.0E0	20C AEROBIC M PSEUDOSEL
*BW0029?12	<1.0E-1	20C AEROBIC M PSEUDOSEL
*BW0014?12	7.0E0	20C AEROBIC M PSEUDOSEL
*BW0023?12	2.0E0	20C AEROBIC M PSEUDOSEL
*BW0018?12	3.0E0	20C AEROBIC M PSEUDOSEL
*BW0015?12	6.5E1	20C AEROBIC M PSEUDOSEL
*BW0016?12	1.0E0	20C AEROBIC M PSEUDOSEL
*BW0024?12	1.0E0	20C AEROBIC M PSEUDOSEL
*BW0025?12	<1.0E-1	20C AEROBIC M PSEUDOSEL
*BW0030?12	1.0E0	20C AEROBIC M PSEUDOSEL
*BW0026?12	<1.0E-1	20C AEROBIC M PSEUDOSEL
*BW0031?12	3.0E0	20C AEROBIC M PSEUDOSEL
*BW0027?12	<1.0E-1	20C AEROBIC M PSEUDOSEL
*BW0032?12	3.4E2	20C AEROBIC M PSEUDOSEL
*BW0033?12	<1.0E-1	20C AEROBIC M PSEUDOSEL
*BW0034?12	3.0	20C AEROBIC M PSEUDOSEL

Table XIII (cont'd)

SEDIMENT					
*BB0001?12	—	20C	AEROBIC	M	PSEUDOSEL
*BB0002?12	—	20C	AEROBIC	M	PSEUDOSEL
*BB0015?12	<1.0E-1	20C	AEROBIC	M	PSEUDOSEL
*BB0031?12	<1.0E-1	20C	AEROBIC	M	PSEUDOSEL
*BB0016?12	<1.0E-1	20C	AEROBIC	M	PSEUDOSEL
*BB0032?12	<1.0E-1	20C	AEROBIC	M	PSEUDOSEL
*BB0007?12	<1.0E-1	20C	AEROBIC	M	PSEUDOSEL
*BB0017?12	<1.0E-1	20C	AEROBIC	M	PSEUDOSEL
*BB0008?12	<1.0E-1	20C	AEROBIC	M	PSEUDOSEL
*BB0018?12	<1.0E-1	20C	AEROBIC	M	PSEUDOSEL
*BB0033?12	<1.0E-1	20C	AEROBIC	M	PSEUDOSEL
*BB0003?12	—	20C	AEROBIC	M	PSEUDOSEL
*BB0005?12	—	20C	AEROBIC	M	PSEUDOSEL
*BB0004?12	—	20C	AEROBIC	M	PSEUDOSEL
*BB0006?12	—	20C	AEROBIC	M	PSEUDOSEL
*BB0009?12	<1.0E-1	20C	AEROBIC	M	PSEUDOSEL
*BB0010?12	<1.0E-1	20C	AEROBIC	M	PSEUDOSEL
*BB0023?12	<1.0E-1	20C	AEROBIC	M	PSEUDOSEL
*BB0013?12	<1.0E-1	20C	AEROBIC	M	PSEUDOSEL
*BB0024?12	<1.0E-1	20C	AEROBIC	M	PSEUDOSEL
*BB0025?12	<1.0E-1	20C	AEROBIC	M	PSEUDOSEL
*BB0011?12	<1.0E-1	20C	AEROBIC	M	PSEUDOSEL
*BB0019?12	<1.0E-1	20C	AEROBIC	M	PSEUDOSEL
*BB0014?12	<1.0E-1	20C	AEROBIC	M	PSEUDOSEL
*BB0012?12	<1.0E-1	20C	AEROBIC	M	PSEUDOSEL
*BB0020?12	<1.0E-1	20C	AEROBIC	M	PSEUDOSEL
*BB0026?12	<1.0E-1	20C	AEROBIC	M	PSEUDOSEL
*BB0021?12	<1.0E-1	20C	AEROBIC	M	PSEUDOSEL
*BB0027?12	<1.0E-1	20C	AEROBIC	M	PSEUDOSEL
*BB0022?12	<1.0E-1	20C	AEROBIC	M	PSEUDOSEL
*BB0028?12	<1.0E-1	20C	AEROBIC	M	PSEUDOSEL
*BB0029?12	<1.0E-1	20C	AEROBIC	M	PSEUDOSEL
*BB0030?12	<1.0E-1	20C	AEROBIC	M	PSEUDOSEL

Table XIV

SALMONELLA-SHIGELLA

SAMPLE NO.	COUNT	CONDITIONS
ICE		
*BW0005?11	4.5E2	20C AERCBIC M SS
*BW0038?11	<1.0E-1	20C AERCBIC M SS
*BW0039?11	<1.0E-1	20C AERCBIC M SS
*BW0040?11	<1.0E-1	20C AERCBIC M SS
WATER		
*BW0042?11	2.0E0	20C AERCBIC M SS
*BW0008?11	<1.0E-1	20C AERCBIC M SS
*BW0043?11	<1.0E-1	20C AERCBIC M SS
*BW0001?11	<1.0E-1	20C AERCBIC M SS
*BW0002?11	<1.0E-1	20C AERCBIC M SS
*BW0003?11	<1.0E-1	20C AERCBIC M SS
*BW0019?11	<1.0E-1	20C AERCBIC M SS
*BW0035?11	3.0E0	20C AERCBIC M SS
*BW0020?11	<1.0E-1	20C AERCBIC M SS
*BW0036?11	<1.0E-1	20C AERCBIC M SS
*BW0009?11	<1.0E-1	20C AERCBIC M SS
*BW0021?11	<1.0E-1	20C AERCBIC M SS
*BW0037?11	<1.0E-1	20C AERCBIC M SS
*BW0010?11	2.0E0	20C AERCBIC M SS
*BW0022?11	<1.0E-1	20C AERCBIC M SS
*BW0041?11	5.0E0	20C AERCBIC M SS
*BW0006?11	<1.0E-1	20C AERCBIC M SS
*BW0004?11	2.9E1	20C AERCBIC M SS
*BW0007?11	<1.0E-1	20C AERCBIC M SS
*BW0011?11	3.0E0	20C AERCBIC M SS
*BW0012?11	5.0E0	20C AERCBIC M SS
*BW0028?11	1.0E0	20C AERCBIC M SS
*BW0017?11	<1.0E-1	20C AERCBIC M SS
*BW0013?11	1.0E0	20C AERCBIC M SS
*BW0029?11	<1.0E-1	20C AERCBIC M SS
*BW0014?11	<1.0E-1	20C AERCBIC M SS
*BW0023?11	<1.0E-1	20C AERCBIC M SS
*BW0018?11	<1.0E-1	20C AERCBIC M SS
*BW0015?11	<1.0E-1	20C AERCBIC M SS
*BW0016?11	<1.0E-1	20C AERCBIC M SS
*BW0024?11	<1.0E-1	20C AERCBIC M SS
*BW0025?11	<1.0E-1	20C AERCBIC M SS
*BW0030?11	<1.0E-1	20C AERCBIC M SS
*BW0026?11	1.0E0	20C AERCBIC M SS
*BW0031?11	<1.0E-1	20C AERCBIC M SS
*BW0027?11	<1.0E-1	20C AERCBIC M SS
*BW0032?11	1.4E1	20C AERCBIC M SS
*BW0033?11	<1.0E-1	20C AERCBIC M SS
*BW0034?11	<1.0E-1	20C AERCBIC M SS

Table XIV (cont'd)

SEDIMENT					
*BB00001?11	—	20C	AEROBIC	M	SS
*BB00002?11	—	20C	AEROBIC	M	SS
*BB00015?11	<1.0E-1	20C	AEROBIC	M	SS
*BB00031?11	<1.0E-1	20C	AEROBIC	M	SS
*BB00016?11	<1.0E-1	20C	AEROBIC	M	SS
*BB00032?11	<1.0E-1	20C	AEROBIC	M	SS
*BB00007?11	0.6E0	20C	AEROBIC	M	SS
*BB00017?11	<1.0E-1	20C	AEROBIC	M	SS
*BB00008?11	<1.0E-1	20C	AEROBIC	M	SS
*BB00018?11	<1.0E-1	20C	AEROBIC	M	SS
*BB00033?11	<1.0E-1	20C	AEROBIC	M	SS
*BB00003?11	—	20C	AEROBIC	M	SS
*BB00005?11	—	20C	AEROBIC	M	SS
*BB00004?11	—	20C	AEROBIC	M	SS
*BB00006?11	—	20C	AEROBIC	M	SS
*BB00009?11	1.3E0	20C	AEROBIC	M	SS
*BB00010?11	1.3E0	20C	AEROBIC	M	SS
*BB00023?11	<1.0E-1	20C	AEROBIC	M	SS
*BB00013?11	<1.0E-1	20C	AEROBIC	M	SS
*BB00024?11	<1.0E-1	20C	AEROBIC	M	SS
*BB00025?11	<1.0E-1	20C	AEROBIC	M	SS
*BB00011?11	<1.0E-1	20C	AEROBIC	M	SS
*BB00019?11	<1.0E-1	20C	AEROBIC	M	SS
*BB00014?11	<1.0E-1	20C	AEROBIC	M	SS
*BB00012?11	<1.0E-1	20C	AEROBIC	M	SS
*BB00020?11	<1.0E-1	20C	AEROBIC	M	SS
*BB00026?11	<1.0E-1	20C	AEROBIC	M	SS
*BB00021?11	<1.0E-1	20C	AEROBIC	M	SS
*BB00027?11	<1.0E-1	20C	AEROBIC	M	SS
*BB00022?11	<1.0E-1	20C	AEROBIC	M	SS
*BB00028?11	<1.0E-1	20C	AEROBIC	M	SS
*BB00029?11	<1.0E-1	20C	AEROBIC	M	SS
*BB00030?11	<1.0E-1	20C	AEROBIC	M	SS

Table XV

PSYCHROPHILIC AND PSYCHROTROPHIC "VIBRIO"

ICE				
*BW0005?09	<1.0E1	04C	AEROBIC	M TCBS
*BW0038?09	3.5E1	04C	AEROBIC	M TCBS
*BW0039?09	2.5E2	04C	AEROBIC	S TCBS
*BW0040?09	3.5E2	04C	AEROBIC	S TCBS
WATER				
*BW0042?09	4.3E2	04C	AEROBIC	S TCBS
*BW0008?09	1.3E2	04C	AEROBIC	S TCBS
*BW0043?09	2.3E2	04C	AEROBIC	S TCBS
*BW0001?09	3.3E2	04C	AEROBIC	S TCBS
*BW0002?09	5.6E2	04C	AEROBIC	S TCBS
*BW0003?09	8.5E1	04C	AEROBIC	S TCBS
*BW0019?09	2.6E2	04C	AEROBIC	S TCBS
*BW0035?09	4.4E2	04C	AEROBIC	S TCBS
*BW0020?09	1.8E2	04C	AEROBIC	S TCBS
*BW0036?09	1.7E2	04C	AEROBIC	S TCBS
*BW0009?09	1.2E2	04C	AEROBIC	S TCBS
*BW0021?09	1.7E2	04C	AEROBIC	S TCBS
*BW0037?09	2.4E2	04C	AEROBIC	S TCBS
*BW0010?09	1.6E2	04C	AEROBIC	S TCBS
*BW0022?09	1.1E2	04C	AEROBIC	S TCBS
*BW0041?09	3.6E2	04C	AEROBIC	S TCBS
*BW0006?09	2.0E2	04C	AEROBIC	S TCBS
*BW0004?09	5.0E1	04C	AEROBIC	S TCBS
*BW0007?09	2.7E2	04C	AEROBIC	S TCBS
*BW0011?09	1.6E1	04C	AEROBIC	S TCBS
*BW0012?09	1.5E2	04C	AEROBIC	S TCBS
*BW0028?09	4.3E1	04C	AEROBIC	S TCBS
*BW0017?09	1.5E1	04C	AEROBIC	S TCBS
*BW0013?09	1.5E1	04C	AEROBIC	S TCBS
*BW0029?09	5.0E0	04C	AEROBIC	M TCBS
*BW0014?09	7.5E0	04C	AEROBIC	M TCBS
*BW0023?09	5.3E1	04C	AEROBIC	S TCBS
*BW0018?09	1.5E1	04C	AEROBIC	S TCBS
*BW0015?09	4.3E1	04C	AEROBIC	S TCBS
*BW0016?09	3.0E1	04C	AEROBIC	S TCBS
*BW0024?09	6.0E1	04C	AEROBIC	S TCBS
*BW0025?09	2.3E1	04C	AEROBIC	S TCBS
*BW0030?09	2.3E1	04C	AEROBIC	S TCBS
*BW0026?09	<1.0E1	04C	AEROBIC	M TCBS
*BW0031?09	<1.0E1	04C	AEROBIC	M TCBS
*BW0027?09	2.0E1	04C	AEROBIC	S TCBS
*BW0032?09	5.0E0	04C	AEROBIC	M TCBS
*BW0033?09	1.0E2	04C	AEROBIC	S TCBS
*BW0034?09	5.0E1	04C	AEROBIC	S TCBS

Table XV (cont'd)

SEDIMENT				
*BB0001?09	<1.0E1	04C AERCBIC	S	TCBS
*BB0002?09	<1.0E1	04C AERCBIC	S	TCBS
*BB0015?09	1.4E2	04C AERCBIC	S	TCBS
*BB0031?09	3.2E3	04C AERCBIC	S	TCBS
*BB0016?09	2.3E3	04C AERCBIC	S	TCBS
*BB0032?09	3.8E3	04C AERCBIC	S	TCBS
*BB0007?09	1.6E3	04C AERCBIC	S	TCBS
*BB0017?09	6.0E1	04C AERCBIC	S	TCBS
*BB0008?09	<1.0E1	04C AERCBIC	S	TCBS
*BB0018?09	2.3E3	04C AERCBIC	S	TCBS
*BB0033?09	1.1E3	04C AERCBIC	S	TCBS
*BB0003?09	1.3E2	04C AERCBIC	S	TCBS
*BB0005?09	1.4E3	04C AERCBIC	S	TCBS
*BB0004?09	4.2E2	04C AERCBIC	S	TCBS
*BB0006?09	1.6E3	04C AERCBIC	S	TCBS
*BB0009?09	3.7E2	04C AERCBIC	S	TCBS
*BB0010?09	1.0E2	04C AERCBIC	S	TCBS
*BB0023?09	1.2E2	04C AERCBIC	S	TCBS
*BB0013?09	1.0E1	04C AERCBIC	S	TCBS
*BB0024?09	1.9E2	04C AERCBIC	S	TCBS
*BB0025?09	1.4E2	04C AERCBIC	S	TCBS
*BB0011?09	4.6E1	04C AERCBIC	S	TCBS
*BB0019?09	6.0E1	04C AERCBIC	S	TCBS
*BB0014?09	3.0E1	04C AERCBIC	S	TCBS
*BB0012?09	1.1E2	04C AERCBIC	S	TCBS
*BB0020?09	7.0E1	04C AERCBIC	S	TCBS
*BB0026?09	5.0E1	04C AERCBIC	S	TCBS
*BB0021?09	3.8E1	04C AERCBIC	S	TCBS
*BB0027?09	1.5E2	04C AERCBIC	S	TCBS
*BB0022?09	4.2E2	04C AERCBIC	S	TCBS
*BB0028?09	1.2E2	04C AERCBIC	S	TCBS
*BB0029?09	4.6E2	04C AERCBIC	S	TCBS
*BB0030?09	1.0E2	04C AERCBIC	S	TCBS

Table XVI

MESOPHILIC "VIBRIO"

SAMPLE NO.	COUNT	CONDITIONS
ICE		
*BW0005?710	<1.0E0	20C AEROBIC M TCBS
*BW0038?710	2.0E1	20C AEROBIC M TCBS
*BW0039?710	5.8E1	20C AEROBIC M TCBS
*BW0040?710	1.0E1	20C AEROBIC M TCBS
WATER		
*BW0042?710	1.8E1	20C AEROBIC M TCBS
*BW0008?710	<1.0E0	20C AEROBIC M TCBS
*BW0043?710	2.5E0	20C AEROBIC M TCBS
*BW0001?710	<1.0E0	20C AEROBIC M TCBS
*BW0002?710	<1.0E0	20C AEROBIC M TCBS
*BW0003?710	9.0E0	20C AEROBIC M TCBS
*BW0019?710	<1.0E0	20C AEROBIC M TCBS
*BW0035?710	2.0E1	20C AEROBIC M TCBS
*BW0020?710	<1.0E0	20C AEROBIC M TCBS
*BW0036?710	2.5E0	20C AEROBIC M TCBS
*BW0009?710	2.0E0	20C AEROBIC M TCBS
*BW0021?710	<1.0E0	20C AEROBIC M TCBS
*BW0037?710	1.0E1	20C AEROBIC M TCBS
*BW0010?710	1.0E0	20C AEROBIC M TCBS
*BW0022?710	2.5E0	20C AEROBIC M TCBS
*BW0041?710	5.0E0	20C AEROBIC M TCBS
*BW0006?710	1.0E0	20C AEROBIC M TCBS
*BW0004?710	5.0E2	20C AEROBIC M TCBS
*BW0007?710	<1.0E0	20C AEROBIC M TCBS
*BW0011?710	1.0E0	20C AEROBIC M TCBS
*BW0012?710	5.0E0	20C AEROBIC M TCBS
*BW0028?710	2.5E0	20C AEROBIC M TCBS
*BW0017?710	<1.0E0	20C AEROBIC M TCBS
*BW0013?710	2.0E0	20C AEROBIC M TCBS
*BW0029?710	<1.0E0	20C AEROBIC M TCBS
*BW0014?710	<1.0E0	20C AEROBIC M TCBS
*BW0023?710	<1.0E0	20C AEROBIC M TCBS
*BW0018?710	2.5E0	20C AEROBIC M TCBS
*BW0015?710	1.3E1	20C AEROBIC M TCBS
*BW0016?710	1.0E1	20C AEROBIC M TCBS
*BW0024?710	<1.0E0	20C AEROBIC M TCBS
*BW0025?710	7.5E0	20C AEROBIC M TCBS
*BW0030?710	2.5E0	20C AEROBIC M TCBS
*BW0026?710	<1.0E0	20C AEROBIC M TCBS
*BW0031?710	2.5E0	20C AEROBIC M TCBS
*BW0027?710	<1.0E0	20C AEROBIC M TCBS
*BW0032?710	5.8E1	20C AEROBIC M TCBS
*BW0033?710	<1.0E0	20C AEROBIC M TCBS
*BW0034?710	5.0E0	20C AEROBIC M TCBS

Table XVI (cont'd)

SEDIMENT					
*BB0001?10	<1.0E0	20C	AERCBIC	M	TCBS
*BB0002?10	<1.0E0	20C	AERCBIC	M	TCBS
*BB0015?10	2.0E0	20C	AERCBIC	M	TCBS
*BB0031?10	4.8E1	20C	AERCBIC	S	TCBS
*BB0016?10	<1.0E0	20C	AERCBIC	M	TCBS
*BB0032?10	4.8E1	20C	AERCBIC	S	TCBS
*BB0007?10	5.4E0	20C	AERCBIC	M	TCBS
*BB0017?10	1.2E1	20C	AERCBIC	S	TCBS
*BB0008?10	1.3E0	20C	AERCBIC	M	TCBS
*BB0018?10	1.1E2	20C	AERCBIC	S	TCBS
*BB0033?10	5.5E0	20C	AERCBIC	M	TCBS
*BB0003?10	2.0E1	20C	AERCBIC	S	TCBS
*BB0005?10	<1.0E0	20C	AERCBIC	M	TCBS
*BB0004?10	2.6E2	20C	AERCBIC	S	TCBS
*BB0006?10	<1.0E0	20C	AERCBIC	M	TCBS
*BB0009?10	4.2E1	20C	AERCBIC	S	TCBS
*BB0010?10	2.5E0	20C	AERCBIC	M	TCBS
*BB0023?10	2.8E1	20C	AERCBIC	S	TCBS
*BB0013?10	<1.0E0	20C	AERCBIC	M	TCBS
*BB0024?10	<1.0E0	20C	AERCBIC	M	TCBS
*BB0025?10	7.0E0	20C	AERCBIC	M	TCBS
*BB0011?10	7.5E2	20C	AERCBIC	S	TCBS
*BB0019?10	<1.0E0	20C	AERCBIC	M	TCBS
*BB0014?10	9.5E0	20C	AERCBIC	M	TCBS
*BB0012?10	3.8E0	20C	AERCBIC	M	TCBS
*BB0020?10	<1.0E0	20C	AERCBIC	M	TCBS
*BB0026?10	4.0E1	20C	AERCBIC	S	TCBS
*BB0021?10	<1.0E0	20C	AERCBIC	M	TCBS
*BB0027?10	<1.0E0	20C	AERCBIC	M	TCBS
*BB0022?10	<1.0E0	20C	AERCBIC	M	TCBS
*BB0028?10	<1.0E0	20C	AERCBIC	M	TCBS
*BB0029?10	<1.0E0	20C	AERCBIC	M	TCBS
*BB0030?10	<1.0E0	20C	AERCBIC	M	TCBS

Table XVII

OIL-UTILIZING PSYCHROPHILES AND PSYCHROTROPHS

SAMPLE NO.	COUNT	CONDITIONS
ICE		
*BW0005?13	<1.0E0	04C AEROBIC M OIL
*BW0038?13	7.6E1	04C AEROBIC M OIL
*BW0039?13	7.2E0	04C AEROBIC M OIL
*BW0040?13	1.0E1	04C AEROBIC M OIL
WATER		
*BW0042?13	0.8E0	04C AEROBIC M OIL
*BW0008?13	<1.0E0	04C AEROBIC M OIL
*BW0043?13	0.8E0	04C AEROBIC M OIL
*BW0001?13	<2.0E1	04C AEROBIC M OIL
*BW0002?13	3.1E1	04C AEROBIC M OIL
*BW0003?13	2.6E1	04C AEROBIC M OIL
*BW0019?13	<1.0E0	04C AEROBIC M OIL
*BW0035?13	<1.0E0	04C AEROBIC M OIL
*BW0020?13	<1.0E0	04C AEROBIC M OIL
*BW0036?13	<1.0E0	04C AEROBIC M OIL
*BW0009?13	2.5E1	04C AEROBIC M OIL
*BW0021?13	<1.0E0	04C AEROBIC M OIL
*BW0037?13	<1.0E0	04C AEROBIC M OIL
*BW0010?13	<1.0E0	04C AEROBIC M OIL
*BW0022?13	<1.0E0	04C AEROBIC M OIL
*BW0041?13	<1.0E0	04C AEROBIC M OIL
*BW0006?13	<1.0E0	04C AEROBIC M OIL
*BW0004?13	1.3E1	04C AEROBIC M OIL
*BW0007?13	<1.0E0	04C AEROBIC M OIL
*BW0011?13	<1.0E0	04C AEROBIC M OIL
*BW0012?13	<1.0E0	04C AEROBIC M OIL
*BW0028?13	0.1E0	04C AEROBIC M OIL
*BW0017?13	1.1E1	04C AEROBIC M OIL
*BW0013?13	2.9E1	04C AEROBIC M OIL
*BW0029?13	6.2E0	04C AEROBIC M OIL
*BW0014?13	<1.0E0	04C AEROBIC M OIL
*BW0023?13	2.2E0	04C AEROBIC M OIL
*BW0018?13	<1.0E0	04C AEROBIC M OIL
*BW0015?13	6.7E1	04C AEROBIC M OIL
*BW0016?13	4.5E1	04C AEROBIC M OIL
*BW0024?13	2.0E0	04C AEROBIC M OIL
*BW0025?13	1.1E1	04C AEROBIC M OIL
*BW0030?13	0.1E0	04C AEROBIC M OIL
*BW0026?13	2.7E0	04C AEROBIC M OIL
*BW0031?13	0.4E0	04C AEROBIC M OIL
*BW0027?13	3.4E0	04C AEROBIC M OIL
*BW0032?13	3.2E0	04C AEROBIC M OIL
*BW0033?13	<1.0E0	04C AEROBIC M OIL
*BW0034?13	0.3E0	04C AEROBIC M OIL

Table XVII (cont'd)

SEDIMENT					
*BB00001?13	1.4E1	04C	AERCBIC	M	CIL
*BB00002?13	1.0E1	04C	AERCBIC	M	CIL
*BB00015?13	1.1E2	04C	AERCBIC	M	CIL
*BB00031?13	<1.0E0	04C	AERCBIC	M	CIL
*BB00016?13	1.4E3	04C	AERCBIC	M	CIL
*BB00032?13	3.5E1	04C	AERCBIC	M	CIL
*BB00007?13	1.5E3	04C	AERCBIC	M	CIL
*BB00017?13	1.0E2	04C	AERCBIC	M	CIL
*BB00008?13	3.0E2	04C	AERCBIC	M	CIL
*BB00018?13	1.0E2	04C	AERCBIC	M	CIL
*BB00033?13	1.7E1	04C	AERCBIC	M	CIL
*BB00003?13	9.0E1	04C	AERCBIC	M	CIL
*BB00005?13	4.1E0	04C	AERCBIC	M	CIL
*BB00004?13	5.0E3	04C	AERCBIC	M	CIL
*BB00006?13	3.4E0	04C	AERCBIC	M	CIL
*BB00009?13	1.3E3	04C	AERCBIC	M	CIL
*BB00010?13	6.1E2	04C	AERCBIC	M	CIL
*BB00023?13	7.3E1	04C	AERCBIC	M	CIL
*BB00013?13	4.0E3	04C	AERCBIC	M	CIL
*BB00024?13	2.5E2	04C	AERCBIC	M	CIL
*BB00025?13	<1.0E0	04C	AERCBIC	M	CIL
*BB00011?13	4.1E3	04C	AERCBIC	M	CIL
*BB00019?13	9.2E2	04C	AERCBIC	M	CIL
*BB00014?13	1.3E3	04C	AERCBIC	M	CIL
*BB00012?13	7.0E3	04C	AERCBIC	M	CIL
*BB00020?13	3.8E1	04C	AERCBIC	M	CIL
*BB00026?13	<1.0E0	04C	AERCBIC	M	CIL
*BB00021?13	2.4E2	04C	AERCBIC	M	CIL
*BB00027?13	<1.0E0	04C	AERCBIC	M	CIL
*BB00022?13	1.1E2	04C	AERCBIC	M	CIL
*BB00028?13	<1.0E0	04C	AERCBIC	M	CIL
*BB00029?13	<1.0E0	04C	AERCBIC	M	CIL
*BB00030?13	1.0E2	04C	AERCBIC	M	CIL

Table XVIII

OIL-UTILIZING MESOPHILES

SAMPLE NO.	COUNT	CONDITIONS
ICE		
*BW0005?14	<1.0E0	20C AEROBIC M OIL
*BW0038?14	2.3E0	20C AEROBIC M OIL
*BW0039?14	2.0E0	20C AEROBIC M OIL
*BW0040?14	5.2E1	20C AEROBIC M OIL
WATER		
*BW0042?14	2.8E0	20C AEROBIC M OIL
*BW0008?14	6.1E1	20C AEROBIC M OIL
*BW0043?14	0.7E0	20C AEROBIC M OIL
*BW0001?14	2.0E0	20C AEROBIC M OIL
*BW0002?14	3.0E1	20C AEROBIC M OIL
*BW0003?14	2.0E1	20C AEROBIC M OIL
*BW0019?14	6.2E0	20C AEROBIC M OIL
*BW0035?14	8.1E0	20C AEROBIC M OIL
*BW0020?14	3.0E0	20C AEROBIC M OIL
*BW0036?14	0.5E0	20C AEROBIC M OIL
*BW0009?14	1.3E1	20C AEROBIC M OIL
*BW0021?14	1.3E0	20C AEROBIC M OIL
*BW0037?14	0.5E0	20C AEROBIC M OIL
*BW0010?14	6.3E0	20C AEROBIC M OIL
*BW0022?14	0.8E0	20C AEROBIC M OIL
*BW0041?14	2.1E0	20C AEROBIC M OIL
*BW0006?14	1.0E2	20C AEROBIC M OIL
*BW0004?14	1.7E1	20C AEROBIC M OIL
*BW0007?14	1.0E2	20C AEROBIC M OIL
*BW0011?14	4.8E0	20C AEROBIC M OIL
*BW0012?14	4.0E0	20C AEROBIC M OIL
*BW0028?14	1.1E0	20C AEROBIC M OIL
*BW0017?14	1.0E0	20C AEROBIC M OIL
*BW0013?14	5.0E0	20C AEROBIC M OIL
*BW0029?14	0.6E0	20C AEROBIC M OIL
*BW0014?14	2.5E0	20C AEROBIC M OIL
*BW0023?14	1.0E0	20C AEROBIC M OIL
*BW0018?14	5.2E0	20C AEROBIC M OIL
*BW0015?14	1.1E1	20C AEROBIC M OIL
*BW0016?14	3.5E0	20C AEROBIC M OIL
*BW0024?14	1.0E0	20C AEROBIC M OIL
*BW0025?14	2.0E0	20C AEROBIC M OIL
*BW0030?14	0.1E0	20C AEROBIC M OIL
*BW0026?14	7.0E0	20C AEROBIC M OIL
*BW0031?14	0.2E0	20C AEROBIC M OIL
*BW0027?14	<1.0E0	20C AEROBIC M OIL
*BW0032?14	1.0E0	20C AEROBIC M OIL
*BW0033?14	0.2E0	20C AEROBIC M OIL
*BW0034?14	0.7E0	20C AEROBIC M OIL

Table XVIII (cont'd)

SEDIMENT		
*BB0001?14	1.4E1	20C AEROBIC M OIL
*BB0002?14	1.0E1	20C AEROBIC M OIL
*BB0015?14	1.2E3	20C AEROBIC M OIL
*BB0031?14	2.0E2	20C AEROBIC M OIL
*BB0016?14	7.7E2	20C AEROBIC M OIL
*BB0032?14	7.0E1	20C AEROBIC M OIL
*BB0007?14	2.0E2	20C AEROBIC M OIL
*BB0017?14	1.4E2	20C AEROBIC M OIL
*BB0008?14	1.5E2	20C AEROBIC M OIL
*BB0018?14	2.7E2	20C AEROBIC M OIL
*BB0033?14	4.5E1	20C AEROBIC M OIL
*BB0003?14	1.3E2	20C AEROBIC M OIL
*BB0005?14	4.1E1	20C AEROBIC M OIL
*BB0004?14	3.4E2	20C AEROBIC M OIL
*BB0006?14	2.1E2	20C AEROBIC M OIL
*BB0009?14	1.1E2	20C AEROBIC M OIL
*BB0010?14	6.5E1	20C AEROBIC M OIL
*BB0023?14	3.2E2	20C AEROBIC M OIL
*BB0013?14	2.5E2	20C AEROBIC M OIL
*BB0024?14	2.6E2	20C AEROBIC M OIL
*BB0025?14	2.4E2	20C AEROBIC M OIL
*BB0011?14	8.3E3	20C AEROBIC M OIL
*BB0019?14	4.2E1	20C AEROBIC M OIL
*BB0014?14	1.5E2	20C AEROBIC M OIL
*BB0012?14	7.0E3	20C AEROBIC M OIL
*BB0020?14	7.6E1	20C AEROBIC M OIL
*BB0026?14	8.0E1	20C AEROBIC M OIL
*BB0021?14	6.4E1	20C AEROBIC M OIL
*BB0027?14	6.2E1	20C AEROBIC M OIL
*BB0022?14	1.2E1	20C AEROBIC M OIL
*BB0028?14	5.4E1	20C AEROBIC M OIL
*BB0029?14	8.4E1	20C AEROBIC M OIL
*BB0030?14	2.7E2	20C AEROBIC M OIL

Table XIX

NUMBER OF ISOLANTS BY LOCATION

Station	4C		20C	
	Water	Sediment	Water	Sediment
1	4	5	--	--
2	28	29	24	24
10	13	24	24	22
30	2	24	25	24
55	23	25	19	24
70	25	25	20	25
71	25	24	21	24

Table XX

NUMBER OF ISOLANTS BY LOCATION

Station	4C	20C	Water	Sediment	Total
1	9	0	4	5	9
2	57	48	52	53	105
10	37	46	37	46	83
30	26	49	27	48	75
55	48	43	42	49	91
70	50	45	45	50	95
71	49	45	46	48	94

TABLE XXI

	4C Water Isolants	4C Sediment Isolants	20C Water Isolants	20C Sediment Isolants
NO. OF ORGANISMS TESTED	120	156	133	143
MORPHOLOGY				
Non-pigmented (gray) colonies	18	70	83	45
Produce non-diffusible pigment	79	58	37	65
Produce diffusible pigment	0	4	0	1
Pigment not recorded	23	24	13	32
PHYSIOLOGY				
Capable of growth at 5C	--	—	127	136
Capable of growth at 10C	116	152	127	140
Capable of growth at 15C	115	151	128	138
Capable of growth at 20C	104	85	—	–
Capable of growth at 37C	1	0	10	6
Capable of growth in presence of 3% NaCl	98	142	126	137
Capable of growth in presence of 5% NaCl	84	106	120	91
Capable of growth in presence of 7.5% NaCl	32	31	81	48
Capable of growth at pH 4 or pH 5	53	115	68	105
Capable of growth at pH 6	94	135	128	141
Capable of growth at pH 7	102	137	128	137
Capable of growth at pH 8 or pH 9	110	146	128	139
NUTRITIONAL				
Capable of utilizing carbohydrates	84	99	115	73
Capable of utilizing amino acids	56	84	108	61
Capable of utilizing alcohols	34	58	108	51
Capable of utilizing phenol	0	1	1	0
Capable of utilizing carboxylic acids (TCA cycle)	41	76	109	62
Capable of utilizing fatty acids	31	42	107	56
Capable of utilizing pyruvic acid	36	77	97	55
Capable of utilizing acetic acid	24	26	99	40
Capable of utilizing benzoic acid	0	0	6	5
Capable of utilizing hydrocarbons	1	2	6	3
Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl	1	2	5	3
Require growth factors (vitamins, amino acids or unknown)	115	118	110	123
Amino acids and yeast extract serve as growth factors (vitamins alone insufficient)	30	29	8	53
Require unknown growth factors	6	8	5	15
Vitamins serve as growth factors	79	81	97	55

TABLE XXII

NO. OF ORGANISMS TESTED	4C Isolants 276	20C Isolants 276	Water Isolants 253	Sediment Isolants 299	Total Isolants 552
MORPHOLOGY					
Non-pigmented (gray) colonies	88	128	101	115	216
Produce non-diffusible pigment	137	102	116	123	239
Produce diffusible pigment	4	1	0	5	5
Pigment not recorded	47	45	36	56	92
PHYSIOLOGY					
Capable of growth at 5C	—	263	—	—	—
Capable of growth at 10C	268	267	243	292	535
Capable of growth at 15C	266	266	243	289	532
Capable of growth at 20C	189	—	—	—	—
Capable of growth at 37C	1	16	11	6	17
Capable of growth in presence of 3% NaCl	240	263	224	279	503
Capable of growth in presence of 5% NaCl	190	211	204	197	401
Capable of growth in presence of 7.5% NaCl	63	129	113	79	192
Capable of growth at pH 4 or pH 5	168	173	121	220	341
Capable of growth at pH 6	229	269	222	276	498
Capable of growth at pH 7	239	265	230	274	504
Capable of growth at pH 8 or pH 9	256	267	238	285	523
NUTRITIONAL					
Capable of utilizing carbohydrates	183	188	199	172	371
Capable of utilizing amino acids	140	169	164	145	309
Capable of utilizing alcohols	92	159	142	109	251
Capable of utilizing phenol	1	1	1	1	2
Capable of utilizing carboxylic acids (TCA cycle)	117	171	150	138	288
Capable of utilizing fatty acids	73	163	138	98	236
Capable of utilizing pyruvic acid	113	152	133	132	265
Capable of utilizing acetic acid	50	152	133	132	265
Capable of utilizing benzoic acid	0	139	123	66	189
Capable of utilizing hydrocarbons	3	11	6	5	11
Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl	3	9	7	5	12
Require growth factors (vitamins, amino acids or unknown)	233	8	6	5	11
Amino acids and yeast extract serve as growth factors (vitamins alone insufficient)	59	61	38	82	120
Require unknown growth factors	14	20	11	23	34
Vitamins serve as growth factors	160	152	176	136	312

TABLE XXIII

	% ISOLANTS 4C	20C	Water	Sediment	Total
MORPHOLOGY					
Non-pigmented (gray) colonies	32	46	40	38	39
Produce non-diffusible pigment	50	37	46	41	43
Produce diffusible pigment	1	0.3	0	2	1
Pigment not recorded	2	16	14	19	17
PHYSIOLOGY					
Capable of growth at 5C	--	95	--	--	--
Capable of growth at 10C	97	97	96	98	97
Capable of growth at 15C	96	96	96	97	96
Capable of growth at 20C	68	--	--	--	--
Capable of growth at 37C	0.3	6	4	2	3
Capable of growth in presence of 3% NaCl	87	95	88	93	91
Capable of growth in presence of 5% NaCl	69	76	81	66	73
Capable of growth in presence of 7.5% NaCl	23	47	45	26	35
Capable of growth at pH 4 or pH 5	61	63	48	74	62
Capable of growth at pH 6	83	97	88	92	90
Capable of growth at pH 7	87	96	91	92	91
Capable of growth at pH 8 or pH 9	93	97	94	95	95
NUTRITIONAL					
Capable of utilizing carbohydrates	66	68	79	58	67
Capable of utilizing amino acids	51	61	65	48	56
Capable of utilizing alcohols	33	58	56	36	45
Capable of utilizing phenol	0.3	0.3	0.3	0.3	0.3
Capable of utilizing carboxylic acids (TCA cycle)	42	62	60	46	52
Capable of utilizing fatty acids	26	[illegible]	55	32	43
Capable of utilizing pyruvic acid	47	55	53	44	48
Capable of utilizing acetic acid	18	50	49	22	34
Capable of utilizing benzoic acid	0	4	2	2	2
Capable of utilizing hydrocarbons	1	3	3	2	2
Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl	1	3	2	2	2
Require growth factors (vitamins, amino acids or unknown)	84	84	89	81	84
Amino acids and yeast extract serve as growth factors (vitamins alone insufficient)	21	22	15	27	22
Require unknown growth factors	5	7	4	8	6

Table XXIV - STATION 1

	4C Water	4C Sediment	20C Water	20C Sediment
NO. OF ORGANISMS TESTED	4	5	0	0
MORPHOLOGY				
Non-pigmented (gray) colonies	0	1	—	—
Produce non-diffusible pigment	2	4	—	—
Produce diffusible pigment	0	0	—	—
Pigment not recorded	2	0	—	—
PHYSIOLOGY				
Capable of growth at 5C	—	—	—	—
Capable of growth at 10C	4	5	—	—
Capable of growth at 15C	4	5	—	—
Capable of growth at 20C	2	5	—	—
Capable of growth at 37C	0	0	—	—
Capable of growth in presence of 3% NaCl	4	5	—	—
Capable of growth in presence of 5% NaCl	4	2	—	—
Capable of growth in presence of 7.5% NaCl	1	1	—	—
Capable of growth at pH 4 or pH 5	3	4	—	—
Capable of growth at pH 6	4	5	—	—
Capable of growth at pH 7	4	5	—	—
Capable of growth at pH 8 or pH 9	4	5	—	—
NUTRITIONAL				
Capable of utilizing carbohydrates	3	5	—	—
Capable of utilizing amino acids	3	4	—	—
Capable of utilizing alcohols	1	2	—	—
Capable of utilizing phenol	0	0	—	—
Capable of utilizing carboxylic acids (TCA cycle)	1	1	—	—
Capable of utilizing fatty acids	1	2	—	—
Capable of utilizing pyruvic acid	2	2	—	—
Capable of utilizing acetic acid	1	1	—	—
Capable of utilizing benzoic acid	0	0	—	—
Capable of utilizing hydrocarbons	0	0	—	—
Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl	0	0	—	—
Require growth factors (vitamins, amino acids or unknown)	3	5	—	—
Amino acids and yeast extract serve as growth factors (vitamins alone insufficient)	1	0	—	—
Require unknown growth factors	0	0	—	—
Vitamins serve as growth factors	2	5	—	—

Table XXV - Station 1

	4C	20C	Water	Sediment	Total
NO. OF ORGANISMS TESTED	9	0	4	5	9
MORPHOLOGY					
Non-pigmented (gray) colonies	1.		0	1	1
Produce non-diffusible pigment	6		2	4	6
Produce diffusible pigment	0		0	0	0
Pigment not recorded	2		2	0	2
PHYSIOLOGY					
Capable of growth at 5C	—	—	—	—	—
Capable of growth at 10C	9	—	4	5	9
Capable of growth at 15C	9	—	4	5	9
Capable of growth at 20C	7	—	2	5	7
Capable of growth at 37C	0	—	0	0	0
Capable of growth in presence of 3% NaCl	0	—	4	5	9
Capable of growth in presence of 5% NaCl	6	—	4	2	6
Capable of growth in presence of 7.5% NaCl	2	—	1	1	2
Capable of growth at pH 4 or pH 5	7	—	3	4	7
Capable of growth at pH 6	9	—	4	5	9
Capable of growth at pH 7	9	—	4	5	9
Capable of growth at pH 8 or pH 9	9	—	4	5	9
NUTRITIONAL					
Capable of utilizing carbohydrates	8	—	3	5	8
Capable of utilizing amino acids	7	—	3	4	7
Capable of utilizing alcohols	3	—	1	2	3
Capable of utilizing phenol	0	—	0	0	0
Capable of utilizing carboxylic acids (TCA cycle)	2	—	1	1	2
Capable of utilizing fatty acids	3	—	1	2	3
Capable of utilizing pyruvic acid	4	—	2	2	4
Capable of utilizing acetic acid	2	—	1	1	2
Capable of utilizing benzoic acid	0	—	0	0	0
Capable of utilizing hydrocarbons	0	—	0	0	0
Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl	0	—	0	0	0
Require growth factors (vitamins, amino acids or unknown)	8	—	3	5	8
Amino acids and yeast extract serve as growth factors (vitamins alone insufficient)	1	—	1	0	1
Require unknown growth factors	0	—	0	0	0
Vitamins serve as growth factors	7	—	2	5	7

Table XXVI - Station 1

	Percentage				
	4C	20C	Water	Sediment	Total
NO. OF ORGANISMS TESTED					
MORPHOLOGY					
Non-pigmented (gray) colonies	11	—	0	20	11
Produce non-diffusible pigment	66	—	50	80	66
Produce diffusible pigment	0	—	0	0	0
Pigment not recorded	22	—	50	0	22
PHYSIOLOGY					
Capable of growth at 5C	—	—	—	—	—
Capable of growth at 10C	100	—	100	100	100
Capable of growth at 15C	100	—	100	100	100
Capable of growth at 20C	78	—	50	100	78
Capable of growth at 37C	0	—	0	0	0
Capable of growth in presence of 3% NaCl	100	—	100	100	100
Capable of growth in presence of 5% NaCl	66	—	100	40	66
Capable of growth in presence of 7.5% NaCl	22	—	25	20	22
Capable of growth at pH 4 or pH 5	78	—	75	80	78
Capable of growth at pH 6	100	—	100	100	100
Capable of growth at pH 7	100	—	100	100	100
Capable of growth at pH 8 or pH 9	100	—	100	100	100
NUTRITIONAL					
Capable of utilizing carbohydrates	89	—	75	100	89
Capable of utilizing amino acids	78	—	75	80	78
Capable of utilizing alcohols	33	—	25	40	33
Capable of utilizing phenol	0	—	0	0	0
Capable of utilizing carboxylic acids (TCA cycle)	22	—	25	20	22
Capable of utilizing fatty acids	33	—	25	40	33
Capable of utilizing pyruvic acid	44	—	50	40	44
Capable of utilizing acetic acid	22	—	25	20	22
Capable of utilizing benzoic acid	0	—	0	0	0
Capable of utilizing hydrocarbons	0	—	0	0	0
Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl	0	—	0	0	0
Require growth factors (vitamins, amino acids or unknown)	89	—	75	100	89
Amino acids and yeast extract serve as growth factors (vitamins alone insufficient)	11	—	25	0	11
Require unknown growth factors	0	—	0	0	0
Vitamins serve as growth factors	78	—	50	100	78

Table XXVII - Station 2

	4C		20C	
	Water	Sediment	Water	Sediment
NO. OF ORGANISMS TESTED	28	29	24	24
MORPHOLOGY				
Non-pigmented (gray) colonies	10	19	18	2
Produce non-diffusible pigment	14	4	6	9
Produce diffusible pigment	0	0	0	0
Pigment not recorded	4	6	0	13
PHYSIOLOGY				
Capable of growth at 5C	--	--	24	24
Capable of growth at 10C	25	29	24	24
Capable of growth at 15C	25	28	24	24
Capable of growth at 20C	20	10	--	--
Capable of growth at 37C	0	0	1	1
Capable of growth in presence of 3% NaCl	20	28	24	21
Capable of growth in presence of 5% NaCl	17	17	23	8
Capable of growth in presence of 7.5% NaCl	7	3	11	1
Capable of growth at pH 4 or pH 5	5	18	10	9
Capable of growth at pH 6	17	26	24	24
Capable of growth at pH 7	20	27	24	23
Capable of growth at pH 8 or pH 9	21	23	24	22
NUTRITIONAL				
Capable of utilizing carbohydrates	15	21	23	6
Capable of utilizing amino acids	16	14	13	4
Capable of utilizing alcohols	11	17	20	2
Capable of utilizing phenol	0	1	0	0
Capable of utilizing carboxylic acids (TCA cycle)	13	17	21	3
Capable of utilizing fatty acids	11	4	20	4
Capable of utilizing pyruvic acid	11	8	19	9
Capable of utilizing acetic acid	7	4	19	2
Capable of utilizing benzoic acid	0	0	0	0
Capable of utilizing hydrocarbons	0	1	0	0
Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl	0	1	0	0
Require growth factors (vitamins, amino acids or unknown)	25	25	22	23
Amino acids and yeast extract serve as growth factors (vitamins alone insufficient)	8	5	0	13
Require unknown growth factors	3	2	0	6
Vitamins serve as growth factors	14	18	22	4

Table XXVIII - Station 2

	4C	20C	Water	Sediment	Total
NO. OF ORGANISMS TESTED	58	49	52	53	105
MORPHOLOGY					
Non-pigmented (gray) colonies	29	20	28	21	49
Produce non-diffusible pigment	18	15	20	13	33
Produce diffusible pigment	0	0	0	0	0
Pigment not recorded	10	13	4	19	23
PHYSIOLOGY					
Capable of growth at 5C	--	48	--	--	--
Capable of growth at 10C	54	48	49	43	102
Capable of growth at 15C	53	48	49	42	101
Capable of growth at 20C	30	--	--	--	--
Capable of growth at 37C	0	2	1	1	2
Capable of growth in presence of 3% NaCl	48	45	44	49	93
Capable of growth in presence of 5% NaCl	34	31	40	25	65
Capable of growth in presence of 7.5% NaCl	10	12	18	4	22
Capable of growth at pH 4 or pH 5	23	19	15	27	42
Capable of growth at pH 6	43	48	41	50	91
Capable of growth at pH 7	47	47	44	50	94
Capable of growth at pH 8 or pH 9	44	46	45	45	90
NUTRITIONAL					
Capable of utilizing carbohydrates	36	29	38	27	65
Capable of utilizing amino acids	30	17	29	18	47
Capable of utilizing alcohols	38	22	31	19	50
Capable of utilizing phenol	1	0	0	1	1
Capable of utilizing carboxylic acids (TCA cycle)	30	24	34	20	54
Capable of utilizing fatty acids	15	24	31	8	39
Capable of utilizing pyruvic acid	19	28	30	17	47
Capable of utilizing acetic acid	11	21	26	6	32
Capable of utilizing benzoic acid	0	0	0	0	0
Capable of utilizing hydrocarbons	1	0	0	1	1
Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl	1	0	0	1	1
Require growth factors (vitamins, amino acids or unknown)	50	45	47	48	95
Amino acids and yeast extract serve as growth factors (vitamins alone insufficient)	13	13	8	18	26
Require unknown growth factors	5	6	3	8	11
Vitamins serve as growth factors	32	26	36	22	58

Table XXIX - Station 2

	Percentage				
	4C	20C	Water	Sediment	Total
NO. OF ORGANISMS TESTED					
MORPHOLOGY					
Non-pigmented (gray) colonies	51	42	54	40	47
Produce non-diffusible pigment	32	31	38	25	31
Produce diffusible pigment	0	0	0	0	0
Pigment not recorded	18	27	8	36	22
PHYSIOLOGY					
Capable of growth at 5C	—	100	—	—	—
Capable of growth at 10C	95	100	94	100	97
Capable of growth at 15C	93	100	94	98	96
Capable of growth at 20C	53	—	—	—	—
Capable of growth at 37C	0	4	2	2	2
Capable of growth in presence of 3% NaCl	84	94	85	92	89
Capable of growth in presence of 5% NaCl	60	64	77	47	62
Capable of growth in presence of 7.5% NaCl	18	25	35	8	21
Capable of growth at pH 4 or pH 5	40	40	29	51	40
Capable of growth at pH 6	75	100	79	94	87
Capable of growth at pH 7	82	98	85	94	90
Capable of growth at pH 8 or pH 9	77	96	87	85	86
NUTRITIONAL					
Capable of utilizing carbohydrates	63	60	73	51	62
Capable of utilizing amino acids	52	35	56	34	45
Capable of utilizing alcohols	67	46	60	36	48
Capable of utilizing phenol	2	0	0	2	1
Capable of utilizing carboxylic acids (TCA cycle)	53	50	65	38	51
Capable of utilizing fatty acids	26	50	60	15	37
Capable of utilizing pyruvic acid	33	58	58	32	45
Capable of utilizing acetic acid	19	44	50	11	30
Capable of utilizing benzoic acid	0	0	0	0	0
Capable of utilizing hydrocarbons	2	0	0	2	1
Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl	2	0	0	2	1
Require growth factors (vitamins, amino acids or unknown)	88	94	90	91	90
Amino acids and yeast extract serve as growth factors (vitamins alone insufficient)	23	27	15	34	25
Require unknown growth factors	9	12	6	15	10
Vitamins serve as growth factors	56	54	69	42	55

Table XXX - Station 10

	4C Water	4C Sediment	20C Water	20C Sediment
NO. OF ORGANISMS TESTED	13	24	24	22
MORPHOLOGY				
Non-pigmented (gray) colonies	0	13	3	8
Produce non-diffusible pigment	7	3	19	10
Produce diffusible pigment	0	0	0	0
Pigment not recorded	6	8	2	4
PHYSIOLOGY				
Capable of growth at 5C	—	—	24	21
Capable of growth at 10C	13	24	24	21
Capable of growth at 15C	13	23	24	19
Capable of growth at 20C	6	4	–	–
Capable of growth at 37C	0	0	3	2
Capable of growth in presence of 3% NaCl	11	23	24	21
Capable of growth in presence of 5% NaCl	10	20	21	21
Capable of growth in presence of 7.5% NaCl	4	0	13	15
Capable of growth at pH 4 or pH 5	7	19	24	19
Capable of growth at pH 6	10	22	24	21
Capable of growth at pH 7	11	22	24	20
Capable of growth at pH 8 or pH 9	13	24	24	21
NUTRITIONAL				
Capable of utilizing carbohydrates	6	15	20	13
Capable of utilizing amino acids	0	6	20	12
Capable of utilizing alcohols	2	12	18	13
Capable of utilizing phenol	0	0	1	0
Capable of utilizing carboxylic acids (TCA cycle)	0	10	13	14
Capable of utilizing fatty acids	0	5	19	14
Capable of utilizing pyruvic acid	2	16	18	14
Capable of utilizing acetic acid	0	3	15	14
Capable of utilizing benzoic acid	0	0	3	5
Capable of utilizing hydrocarbons	0	0	3	3
Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl	0	0	3	3
Require growth factors (vitamins, amino acids or unknown)	12	16	18	18
Amino acids and yeast extract serve as growth factors (vitamins alone insufficient)	3	4	3	3
Require unknown growth factors	3	0	0	3
Vitamins serve as growth factors	6	12	15	12

Table XXXI - Station 10

NO. OF ORGANISMS TESTED	4C 37	20C 46	Water 37	Sediment 46	Total 83
MORPHOLOGY					
Non-pigmented (gray) colonies	13	11	3	21	24
Produce non-diffusible pigment	10	29	26	13	39
Produce diffusible pigment	0	0	0	0	0
Pigment not recorded	14	6	8	12	20
PHYSIOLOGY					
Capable of growth at 5C	—	45	—	—	—
Capable of growth at 10C	37	45	37	45	82
Capable of growth at 15C	36	43	37	42	79
Capable of growth at 20C	10	—	—	—	—
Capable of growth at 37C	0	5	3	2	5
Capable of growth in presence of 3% NaCl	34	45	35	44	79
Capable of growth in presence of 5% NaCl	30	42	31	41	72
Capable of growth in presence of 7.5% NaCl	4	28	17	15	32
Capable of growth at pH 4 or pH 5	16	43	31	38	69
Capable of growth at pH 6	32	45	34	43	77
Capable of growth at pH 7	33	44	35	42	77
Capable of growth at pH 8 or pH 9	37	45	37	45	83
NUTRITIONAL					
Capable of utilizing carbohydrates	11	33	26	28	54
Capable of utilizing amino acids	6	32	20	18	38
Capable of utilizing alcohols	14	31	20	25	45
Capable of utilizing phenol	0	1	1	0	1
Capable of utilizing carboxylic acids (TCA cycle)	10	27	13	24	37
Capable of utilizing fatty acids	5	33	19	19	38
Capable of utilizing pyruvic acid	18	32	20	30	50
Capable of utilizing acetic acid	3	29	15	17	32
Capable of utilizing benzoic acid	0	8	3	5	8
Capable of utilizing hydrocarbons	0	6	3	3	6
Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl	0	6	3	3	6
Require growth factors (vitamins, amino acids or unknown)	28	36	30	34	64
Amino acids and yeast extract serve as growth factors (vitamins alone insufficient)	7	6	6	7	13
Require unknown growth factors	3	3	3	3	6
Vitamins serve as growth factors	18	27	21	24	45

Table XXXII - Station 10

	Percentage				
	4C	20C	Water	Sediment	Total
NO. OF ORGANISMS TESTED					
MORPHOLOGY					
Non-pigmented (gray) colonies	35	24	8	46	29
Produce non-diffusible pigment	27	63	70	28	47
Produce diffusible pigment	0	0	0	0	0
Pigment not recorded	38	13	22	26	24
PHYSIOLOGY					
Capable of growth at 5C	—	98	—	—	—
Capable of growth at 10C	100	98	100	98	99
Capable of growth at 15C	97	93	100	91	95
Capable of growth at 20C	27	—	—	—	—
Capable of growth at 37C	0	11	8	4	6
Capable of growth in presence of 3% NaCl	92	98	95	96	95
Capable of growth in presence of 5% NaCl	81	91	84	89	87
Capable of growth in presence of 7.5% NaCl	11	61	46	33	39
Capable of growth at pH 4 or pH 5	43	93	84	83	83
Capable of growth at pH 6	86	98	92	93	93
Capable of growth at pH 7	89	96	95	91	93
Capable of growth at pH 8 or pH 9	100	98	100	98	100
NUTRITIONAL					
Capable of utilizing carbohydrates	30	72	70	61	65
Capable of utilizing amino acids	16	70	54	39	46
Capable of utilizing alcohols	38	67	54	54	54
Capable of utilizing phenol	0	2	3	0	1
Capable of utilizing carboxylic acids (TCA cycle)	27	59	35	52	45
Capable of utilizing fatty acids	14	72	51	41	46
Capable of utilizing pyruvic acid	49	70	54	65	60
Capable of utilizing acetic acid	8	63	41	37	38
Capable of utilizing benzoic acid	0	17	8	11	10
Capable of utilizing hydrocarbons	0	13	8	7	7
Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl	0	13	8	7	7
Require growth factors (vitamins, amino acids or unknown)	76	78	81	74	77
Amino acids and yeast extract serve as growth factors (vitamins alone insufficient)	19	13	16	15	16
Require unknown growth factors	8	7	8	7	7
Vitamins serve as growth factors	49	59	57	52	54

Table XXXIII - Station 30

	4C		20C	
	Water	Sediment	Water	Sediment
NO. OF ORGANISMS TESTED	2	24	25	24
MORPHOLOGY				
Non-pigmented (gray) colonies	0	11	19	8
Produce non-diffusible pigment	2	7	1	10
Produce diffusible pigment	0	3	0	0
Pigment not recorded	0	3	5	6
PHYSIOLOGY				
Capable of growth at 5C	—	—	24	24
Capable of growth at 10C	2	22	23	24
Capable of growth at 15C	1	22	23	24
Capable of growth at 20C	2	18	—	—
Capable of growth at 37C	0	0	0	1
Capable of growth in presence of 3% NaCl	2	22	23	24
Capable of growth in presence of 5% NaCl	0	15	23	17
Capable of growth in presence of 7.5% NaCl	0	3	19	9
Capable of growth at pH 4 or pH 5	0	19	6	22
Capable of growth at pH 6	2	20	23	24
Capable of growth at pH 7	2	20	23	24
Capable of growth at pH 8 or pH 9	2	22	23	24
NUTRITIONAL				
Capable of utilizing carbohydrates	2	11	21	7
Capable of utilizing amino acids	0	14	21	8
Capable of utilizing alcohols	0	4	21	2
Capable of utilizing phenol	0	0	0	0
Capable of utilizing carboxylic acids (TCA cycle)	1	13	22	7
Capable of utilizing fatty acids	0	13	21	9
Capable of utilizing pyruvic acid	1	17	20	7
Capable of utilizing acetic acid	0	4	19	2
Capable of utilizing benzoic acid	0	0	0	0
Capable of utilizing hydrocarbons	0	1	0	0
Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl	0	1	0	0
Require growth factors (vitamins, amino acids or unknown)	2	14	21	20
Amino acids and yeast extract serve as growth factors (vitamins alone insufficient)	0	3	2	14
Require unknown growth factors	0	0	2	1
Vitamins serve as growth factors	2	11	17	5

Table XXXIV - Station 30

	4C	20C	Water	Sediment	Total
NO. OF ORGANISMS TESTED	26	49	26	48	75
MORPHOLOGY					
Non-pigmented (gray) colonies	11	27	19	19	38
Produce non-diffusible pigment	9	11	3	17	20
Produce diffusible pigment	3	0	0	3	3
Pigment not recorded	3	11	5	9	14
PHYSIOLOGY					
Capable of growth at 5C	--	48	--	--	--
Capable of growth at 10C	24	47	25	46	71
Capable of growth at 15C	23	47	24	46	70
Capable of growth at 20C	20	--	--	--	--
Capable of growth at 37C	0	1	0	1	1
Capable of growth in presence of 3% NaCl	24	47	25	46	71
Capable of growth in presence of 5% NaCl	15	40	23	32	55
Capable of growth in presence of 7.5% NaCl	3	28	19	12	31
Capable of growth at pH 4 or pH 5	19	28	6	41	47
Capable of growth at pH 6	22	47	25	44	69
Capable of growth at pH 7	22	47	25	44	69
Capable of growth at pH 8 or pH 9	24	47	25	44	69
NUTRITIONAL					
Capable of utilizing carbohydrates	13	28	23	18	41
Capable of utilizing amino acids	14	29	21	22	43
Capable of utilizing alcohols	4	23	21	6	27
Capable of utilizing phenol	0	0	0	0	0
Capable of utilizing carboxylic acids (TCA cycle)	14	29	23	20	43
Capable of utilizing fatty acids	13	30	21	22	43
Capable of utilizing pyruvic acid	18	27	21	24	45
Capable of utilizing acetic acid	4	21	19	6	25
Capable of utilizing benzoic acid	0	0	0	0	0
Capable of utilizing hydrocarbons	1	0	0	1	1
Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl	1	0	0	1	1
Require growth factors (vitamins, amino acids or unknown)	16	41	23	34	57
Amino acids and yeast extract serve as growth factors (vitamins alone insufficient)	3	16	2	17	19
Require unknown growth factors	0	3	2	1	3
Vitamins serve as growth factors	13	22	19	16	35

Table XXXV - Station 30

	Percentage				
	4C	20C	Water	Sediment	Total
NO. OF ORGANISMS TESTED					
MORPHOLOGY					
Non-pigmented (gray) colonies	42	55	70	40	51
Produce non-diffusible pigment	35	22	11	35	27
Produce diffusible pigment	11	0	0	6	4
Pigment not recorded	11	22	18	19	19
PHYSIOLOGY					
Capable of growth at 5C	—	98	—	—	—
Capable of growth at 10C	92	96	93	96	95
Capable of growth at 15C	88	96	89	96	93
Capable of growth at 20C	77	—	—	—	—
Capable of growth at 37C	0	2	0	2	1
Capable of growth in presence of 3% NaCl	92	96	93	96	95
Capable of growth in presence of 5% NaCl	58	82	85	67	73
Capable of growth in presence of 7.5% NaCl	12	57	70	25	41
Capable of growth at pH 4 or pH 5	73	57	22	85	63
Capable of growth at pH 6	85	96	93	92	92
Capable of growth at pH 7	85	96	93	92	92
Capable of growth at pH 8 or pH 9	92	96	93	92	92
NUTRITIONAL					
Capable of utilizing carbohydrates	50	57	85	38	55
Capable of utilizing amino acids	54	59	78	46	57
Capable of utilizing alcohols	15	47	78	13	36
Capable of utilizing phenol	0	0	0	0	0
Capable of utilizing carboxylic acids (TCA cycle)	54	59	85	42	57
Capable of utilizing fatty acids	50	61	78	46	57
Capable of utilizing pyruvic acid	69	55	78	50	60
Capable of utilizing acetic acid	15	43	70	13	33
Capable of utilizing benzoic acid	0	0	0	0	0
Capable of utilizing hydrocarbons	4	0	0	2	1
Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl	4	0	0	2	1
Require growth factors (vitamins, amino acids or unknown)	62	84	85	71	76
Amino acids and yeast extract serve as growth factors (vitamins alone insufficient)	12	33	7	35	25
Require unknown growth factors	0	6	7	2	4
Vitamins serve as growth factors	50	45	70	33	47

Table XXXVI - Station 55

	4C Water	4C Sediment	20C Water	20C Sediment
NO. OF ORGANISMS TESTED	23	25	19	24
MORPHOLOGY				
Non-pigmented (gray) colonies	1	6	15	12
Produce non-diffusible pigment	17	18	3	8
Produce diffusible pigment	0	0	0	1
Pigment not recorded	5	1	1	3
PHYSIOLOGY				
Capable of growth at 5C	--	--	18	20
Capable of growth at 10C	23	24	18	23
Capable of growth at 15C	23	24	19	23
Capable of growth at 20C	23	19	--	--
Capable of growth at 37C	0	0	0	0
Capable of growth in presence of 3% NaCl	20	20	19	24
Capable of growth in presence of 5% NaCl	17	19	18	19
Capable of growth in presence of 7.5% NaCl	6	14	15	9
Capable of growth at pH 4 or pH 5	13	17	6	16
Capable of growth at pH 6	20	19	19	24
Capable of growth at pH 7	22	18	19	22
Capable of growth at pH 8 or pH 9	23	22	19	24
NUTRITIONAL				
Capable of utilizing carbohydrates	20	14	17	22
Capable of utilizing amino acids	13	14	16	16
Capable of utilizing alcohols	10	4	15	13
Capable of utilizing phenol	0	0	0	0
Capable of utilizing carboxylic acids (TCA cycle)	9	9	17	16
Capable of utilizing fatty acids	8	5	15	13
Capable of utilizing pyruvic acid	8	10	13	20
Capable of utilizing acetic acid	8	4	14	11
Capable of utilizing benzoic acid	0	0	1	0
Capable of utilizing hydrocarbons	0	0	1	0
Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl	0	0	1	0
Require growth factors (vitamins, amino acids or unknown)	23	19	17	22
Amino acids and yeast extract serve as growth factors (vitamins alone insufficient)	3	7	2	6
Require unknown growth factors	0	1	0	1
Vitamins serve as growth factors	20	11	15	15

Table XXXVII - Station 55

	4C	20C	Water	Sediment	Total
NO. OF ORGANISMS TESTED	48	43	42	49	91
MORPHOLOGY					
Non-pigmented (gray) colonies	7	27	16	18	34
Produce non-diffusible pigment	35	11	20	26	46
Produce diffusible pigment	0	1	0	1	1
Pigment not recorded	6	4	6	4	10
PHYSIOLOGY					
Capable of growth at 5C	—	38	—	—	—
Capable of growth at 10C	47	41	41	47	88
Capable of growth at 15C	47	42	42	47	69
Capable of growth at 20C	42	—	—	—	—
Capable of growth at 37C	0	0	0	0	0
Capable of growth in presence of 3% NaCl	40	43	39	44	83
Capable of growth in presence of 5% NaCl	36	37	35	38	73
Capable of growth in presence of 7.5% NaCl	20	14	21	23	44
Capable of growth at pH 4 or pH 5	30	22	19	33	52
Capable of growth at pH 6	39	43	39	41	80
Capable of growth at pH 7	40	41	41	40	81
Capable of growth at pH 8 or pH 9	45	43	42	46	88
NUTRITIONAL					
Capable of utilizing carbohydrates	34	39	37	46	93
Capable of utilizing amino acids	27	32	29	30	59
Capable of utilizing alcohols	14	28	25	17	42
Capable of utilizing phenol	0	0	0	0	0
Capable of utilizing carboxylic acids (TCA cycle)	18	33	26	25	51
Capable of utilizing fatty acids	13	28	23	18	41
Capable of utilizing pyruvic acid	18	33	21	30	51
Capable of utilizing acetic acid	12	25	22	15	37
Capable of utilizing benzoic acid	0	1	1	0	1
Capable of utilizing hydrocarbons	0	1	1	0	1
Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl	0	1	1	0	1
Require growth factors (vitamins, amino acids or unknown)	42	39	40	41	81
Amino acids and yeast extract serve as growth factors (vitamins alone insufficient)	10	8	5	13	18
Require unknown growth factors	1	1	0	2	2
Vitamins serve as growth factors	31	30	35	26	61

Table XXXVIII - Station 55

	Percentage				
	4C	20C	Water	Sediment	Total
NO. OF ORGANISMS TESTED					
MORPHOLOGY					
Non-pigmented (gray) colonies	15	63	38	37	37
Produce non-diffusible pigment	73	26	48	53	50
Produce diffusible pigment	0	2	–	2	1
Pigment not recorded	13	9	14	8	11
PHYSIOLOGY					
Capable of growth at 5C	—	88	—	—	—
Capable of growth at 10C	98	95	98	96	97
Capable of growth at 15C	98	98	100	96	76
Capable of growth at 20C	88	—	—	—	—
Capable of growth at 37C	0	0	0	0	0
Capable of growth in presence of 3% NaCl	83	100	93	70	91
Capable of growth in presence of 5% NaCl	75	86	83	78	80
Capable of growth in presence of 7.5% NaCl	42	33	50	47	48
Capable of growth at pH 4 or pH 5	63	51	45	67	57
Capable of growth at pH 6	81	100	93	84	88
Capable of growth at pH 7	83	95	98	82	89
Capable of growth at pH 8 or pH 9	94	100	100	94	97
NUTRITIONAL					
Capable of utilizing carbohydrates	71	91	88	94	91
Capable of utilizing amino acids	56	74	69	61	65
Capable of utilizing alcohols	29	65	60	35	46
Capable of utilizing phenol	0	0	0	0	0
Capable of utilizing carboxylic acids (TCA cycle)	38	77	62	51	56
Capable of utilizing fatty acids	27	65	55	37	45
Capable of utilizing pyruvic acid	38	77	50	61	56
Capable of utilizing acetic acid	25	58	52	30	41
Capable of utilizing benzoic acid	0	2	2	0	1
Capable of utilizing hydrocarbons	0	2	2	0	1
Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl	0	2	2	0	1
Require growth factors (vitamins, amino acids or unknown)	88	91	95	84	88
Amino acids and yeast extract serve as growth factors (vitamins alone insufficient)	21	19	12	27	20
Require unknown growth factors	2	2	0	4	2
Vitamins serve as growth factors	65	70	83	53	67

Table XXXIX - Station 70

	4C Water	4C Sediment	20C Water	20C Sediment
NO. OF ORGANISMS TESTED	25	25	20	25
MORPHOLOGY				
Non-pigmented (gray) colonies	3	6	15	11
Produce non-diffusible pigment	18	14	2	12
Produce diffusible pigment	0	1	0	0
Pigment not recorded	4	4	3	2
PHYSIOLOGY				
Capable of growth at 5C	—	—	17	25
Capable of growth at 10C	24	24	19	25
Capable of growth at 15C	24	25	18	25
Capable of growth at 20C	23	19	—	—
Capable of growth at 37C	0	0	3	2
Capable of growth in presence of 3% NaCl	22	23	18	25
Capable of growth in presence of 5% NaCl	19	18	16	12
Capable of growth in presence of 7.5% NaCl	11	5	16	8
Capable of growth at pH 4 or pH 5	10	19	5	18
Capable of growth at pH 6	19	22	18	25
Capable of growth at pH 7	20	23	18	25
Capable of growth at pH 8 or pH 9	23	23	18	25
NUTRITIONAL				
Capable of utilizing carbohydrates	18	17	14	17
Capable of utilizing amino acids	11	19	17	15
Capable of utilizing alcohols	6	8	16	11
Capable of utilizing phenol	0	0	0	0
Capable of utilizing carboxylic acids (TCA cycle)	6	11	16	12
Capable of utilizing fatty acids	6	9	16	9
Capable of utilizing pyruvic acid	8	13	15	15
Capable of utilizing acetic acid	5	5	15	6
Capable of utilizing benzoic acid	0	0	0	0
Capable of utilizing hydrocarbons	0	0	1	0
Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl	0	0	0	0
Require growth factors (vitamins, amino acids or unknown)	25	22	17	21
Amino acids and yeast extract serve as growth factors (vitamins alone insufficient)	7	5	1	7
Require unknown growth factors	0	2	2	3
Vitamins serve as growth factors	18	15	14	11

Table XL - Station 70

	4C	20C	Water	Sediment	Total
NO. OF ORGANISMS TESTED	50	45	45	50	95
MORPHOLOGY					
Non-pigmented (gray) colonies	9	26	8	17	25
Produce non-diffusible pigment	32	14	20	26	46
Produce diffusible pigment	1	0	0	1	1
Pigment not recorded	8	5	7	6	13
PHYSIOLOGY					
Capable of growth at 5C	--	42	--	--	--
Capable of growth at 10C	48	44	43	49	52
Capable of growth at 15C	49	43	42	50	92
Capable of growth at 20C	42	--	--	--	--
Capable of growth at 37C	0	5	3	2	5
Capable of growth in presence of 3% NaCl	45	43	40	48	88
Capable of growth in presence of 5% NaCl	37	28	35	30	65
Capable of growth in presence of 7.5% NaCl	16	24	27	13	40
Capable of growth at pH 4 or pH 5	29	23	15	37	52
Capable of growth at pH 6	31	43	37	47	84
Capable of growth at pH 7	43	43	38	48	86
Capable of growth at pH 8 or pH 9	46	43	41	48	89
NUTRITIONAL					
Capable of utilizing carbohydrates	35	31	32	34	66
Capable of utilizing amino acids	30	32	28	34	62
Capable of utilizing alcohols	14	27	22	19	41
Capable of utilizing phenol	0	0	0	0	0
Capable of utilizing carboxylic acids (TCA cycle)	17	23	22	23	45
Capable of utilizing fatty acids	15	18	22	18	40
Capable of utilizing pyruvic acid	21	28	23	28	51
Capable of utilizing acetic acid	10	11	20	11	31
Capable of utilizing benzoic acid	0	0	0	0	0
Capable of utilizing hydrocarbons	0	0	1	0	1
Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl	0	0	0	0	0
Require growth factors (vitamins, amino acids or unknown)	47	43	42	43	85
Amino acids and yeast extract serve as growth factors (vitamins alone insufficient)	12	12	8	12	20
Require unknown growth factors	2	5	2	5	7
Vitamins serve as growth factors	33	26	32	26	58

Table XLI - Station 70

NO. OF ORGANISMS TESTED	Percentage 4C	20C	Water	Sediment	Total
MORPHOLOGY					
Non-pigmented (gray) colonies	18	58	18	34	26
Produce non-diffusible pigment	64	31	44	52	48
Produce diffusible pigment	2	0	0	3	1
Pigment not recorded	16	11	16	12	14
PHYSIOLOGY					
Capable of growth at 5C	--	93	--	--	--
Capable of growth at 10C	96	98	96	98	55
Capable of growth at 15C	98	96	93	100	97
Capable of growth at 20C	84	--	--	--	--
Capable of growth at 37C	0	11	7	4	5
Capable of growth in presence of 3% NaCl	90	96	89	96	93
Capable of growth in presence of 5% NaCl	74	62	78	60	68
Capable of growth in presence of 7.5% NaCl	32	53	60	26	42
Capable of growth at pH 4 or pH 5	48	51	33	74	55
Capable of growth at pH 6	62	96	82	94	88
Capable of growth at pH 7	86	96	84	96	91
Capable of growth at pH 8 or pH 9	92	96	91	96	94
NUTRITIONAL					
Capable of utilizing carbohydrates	70	69	71	68	69
Capable of utilizing amino acids	60	71	62	68	65
Capable of utilizing alcohols	28	60	49	38	43
Capable of utilizing phenol	0	0	0	0	0
Capable of utilizing carboxylic acids (TCA cycle)	34	51	49	46	47
Capable of utilizing fatty acids	30	40	49	36	42
Capable of utilizing pyruvic acid	42	62	51	56	54
Capable of utilizing acetic acid	20	24	44	22	33
Capable of utilizing benzoic acid	0	0	0	0	0
Capable of utilizing hydrocarbons	0	0	2	0	1
Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl	0	0	0	0	0
Require growth factors (vitamins, amino acids or unknown)	94	96	93	86	89
Amino acids and yeast extract serve as growth factors (vitamins alone insufficient)	24	27	18	24	21
Require unknown growth factors	4	11	4	10	7
Vitamins serve as growth factors	66	58	71	52	61

Table XLII - Station71

	4C Water	4C Sediment	20C Water	20C Sediment
NO. OF ORGANISMS TESTED	25	24	21	24
MORPHOLOGY				
Non-pigmented (gray) colonies	2	14	13	4
Produce non-diffusible pigment	19	8	6	16
Produce diffusible pigment	0	0	0	0
Pigment not recorded	4	2	2	4
PHYSIOLOGY				
Capable of growth at 5C	--	--	20	22
Capable of growth at 10C	25	24	19	22
Capable of growth at 15C	25	14	20	23
Capable of growth at 20C	25	8	--	--
Capable of growth at 37C	1	0	3	0
Capable of growth in presence of 3% NaCl	19	21	18	19
Capable of growth in presence of 5% NaCl	17	15	19	14
Capable of growth in presence of 7.5% NaCl	3	5	7	6
Capable of growth at pH 4 or pH 5	14	19	17	21
Capable of growth at pH 6	20	21	20	23
Capable of growth at pH 7	23	22	20	23
Capable of growth at pH 8 or pH 9	24	23	20	23
NUTRITIONAL				
Capable of utilizing carbohydrates	20	16	19	8
Capable of utilizing amino acids	15	11	21	6
Capable of utilizing alcohols	4	11	18	10
Capable of utilizing phenol	0	0	0	0
Capable of utilizing carboxylic acids (TCA cycle)	11	15	20	9
Capable of utilizing fatty acids	5	4	16	7
Capable of utilizing pyruvic acid	4	11	12	12
Capable of utilizing acetic acid	3	4	17	5
Capable of utilizing benzoic acid	0	0	2	0
Capable of utilizing hydrocarbons	1	0	1	0
Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl	1	0	1	0
Require growth factors (vitamins, amino acids or unknown)	24	16	15	19
Amino acids and yeast extract serve as growth factors (vitamins alone insufficient)	8	5	0	10
Require unknown growth factors	0	3	1	1
Vitamins serve as growth factors	16	8	14	8

Table XLIII - Station 71

	4C	20C	Water	Sediment	Total
NO. OF ORGANISMS TESTED	49	45	46	48	94
MORPHOLOGY					
Non-pigmented (gray) colonies	16	17	15	18	33
Produce non-diffusible pigment	27	22	25	24	49
Produce diffusible pigment	0	0	0	0	0
Pigment not recorded	6	6	6	6	12
PHYSIOLOGY					
Capable of growth at 5C	—	42	—	—	—
Capable of growth at 10C	49	41	44	46	90
Capable of growth at 15C	39	43	45	37	82
Capable of growth at 20C	33	—	—	—	—
Capable of growth at 37C	1	3	4	0	4
Capable of growth in presence of 3% NaCl	40	37	37	40	77
Capable of growth in presence of 5% NaCl	32	33	36	29	65
Capable of growth in presence of 7.5% NaCl	8	13	10	11	21
Capable of growth at pH 4 or pH 5	33	38	31	40	71
Capable of growth at pH 6	41	43	40	44	84
Capable of growth at pH 7	45	43	43	45	88
Capable of growth at pH 8 or pH 9	47	43	44	46	90
NUTRITIONAL					
Capable of utilizing carbohydrates	36	27	39	24	63
Capable of utilizing amino acids	26	27	36	17	53
Capable of utilizing alcohols	15	28	22	21	43
Capable of utilizing phenol	0	0	0	0	0
Capable of utilizing carboxylic acids (TCA cycle)	26	29	31	24	55
Capable of utilizing fatty acids	9	23	21	11	32
Capable of utilizing pyruvic acid	15	24	16	23	39
Capable of utilizing acetic acid	7	22	20	9	29
Capable of utilizing benzoic acid	0	2	2	0	2
Capable of utilizing hydrocarbons	1	1	2	0	2
Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl	1	1	2	0	2
Require growth factors (vitamins, amino acids or unknown)	40	34	39	35	74
Amino acids and yeast extract serve as growth factors (vitamins alone insufficient)	13	10	8	15	23
Require unknown growth factors	3	2	9	4	13
Vitamins serve as growth factors	24	22	30	16	46

Table XLIV - Station 71

	Percentage				
	4C	20C	Water	Sediment	Total
NO. OF ORGANISMS TESTED					
MORPHOLOGY					
Non-pigmented (gray) colonies	33	38	33	38	35
Produce non-diffusible pigment	55	49	54	50	52
Produce diffusible pigment	0	0	0	0	0
Pigment not recorded	12	13	13	13	13
PHYSIOLOGY					
Capable of growth at 5C	—	93	—	—	—
Capable of growth at 10C	100	91	96	96	96
Capable of growth at 15C	80	96	98	77	87
Capable of growth at 20C	67	—	—	—	—
Capable of growth at 37C	2	7	9	0	4
Capable of growth in presence of 3% NaCl	82	82	80	83	82
Capable of growth in presence of 5% NaCl	65	73	78	60	69
Capable of growth in presence of 7.5% NaCl	16	29	22	23	22
Capable of growth at pH 4 or pH 5	67	84	67	83	76
Capable of growth at pH 6	84	96	87	92	89
Capable of growth at pH 7	92	96	93	94	94
Capable of growth at pH 8 or pH 9	96	96	96	96	96
NUTRITIONAL					
Capable of utilizing carbohydrates	73	60	85	50	63
Capable of utilizing amino acids	53	60	78	35	56
Capable of utilizing alcohols	31	62	48	44	46
Capable of utilizing phenol	0	0	0	0	0
Capable of utilizing carboxylic acids (TCA cycle)	53	64	67	50	58
Capable of utilizing fatty acids	18	51	46	23	34
Capable of utilizing pyruvic acid	31	53	35	48	41
Capable of utilizing acetic acid	14	49	43	19	31
Capable of utilizing benzoic acid	0	4	4	0	2
Capable of utilizing hydrocarbons	2	2	4	0	2
Capable of utilizing hydrocarbons at 5C in presence of 3% NaCl	2	2	4	0	2
Require growth factors (vitamins, amino acids or unknown)	82	76	85	73	79
Amino acids and yeast extract serve as growth factors (vitamins alone insufficient)	27	22	17	31	24
Require unknown growth factors	6	4	20	8	14
Vitamins serve as growth factors	49	49	65	33	49

ADDENDUM

TO

ANNUAL REPORT

Assessment of Potential Interactions of Microorganisms and Pollutants Resulting from Petroleum Development on the Outer Continental Shelf in the Beaufort Sea

April 1, 1976

Submitted by: Ronald M. Atlas
Principal Investigator
Department of Biology
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Louisville, Kentucky 40208

Prepared for: Outer Continental Shelf Energy Assessment Program
National Atmospheric and Oceanographic Administration
Fairbanks Project Office
Fairbanks, Alaska

Strains isolated from water at 4C showing gray colonies on solid medium.

1	B00053L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
2	B00058L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
3	B00059L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
4	B00067L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
5	B00069L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
6	B00071L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
7	B00073L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
8	B00075L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
9	B00109L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
10	B00114L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
11	B00174L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
12	B00216L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
13	B00219L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
14	B00225L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
15	B00282L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
16	B00283L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
17	B00294L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002
18	B00295L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002

END FORM
18 STRAINS

Strains isolated from sediment at 4C showing gray colonies on solid medium.

1	B00028L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
2	B00029L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
3	B00030L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
4	B00032L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
5	B00033L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
6	B00034L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
7	B00038L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
8	B00039L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
9	B00040L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
10	B00041L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
11	B00047L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
12	B00048L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
13	B00049L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
14	B00077L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
15	B00078L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
16	B00080L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
17	B00082L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
18	B00084L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
19	B00085L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
20	B00086L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
21	B00089L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
22	B00091L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
23	B00093L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
24	B00094L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
25	B00095L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
26	B00097L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
27	B00098L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
28	B00099L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
29	B00100L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
30	B00126L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
31	B00127L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
32	B00128L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
33	B00129L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
34	B00130L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
35	B00131L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
36	B00132L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
37	B00133L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
38	B00134L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
39	B00135L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
40	B00136L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
41	B00137L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
42	B00149L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
43	B00150L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
44	B00176L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
45	B00181L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
46	B00189L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
47	B00191L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
48	B00195L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
49	B00197L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
50	B00226L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070

51	B00227L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
52	B00236L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
53	B00241L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
54	B00244L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
55	B00248L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
56	B00251L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
57	B00252L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
58	B00253L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
59	B00257L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
60	B00258L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
61	B00265L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
62	B00267L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
63	B00268L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
64	B00271L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
65	B00273L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
66	B00275L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
67	B00290L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
68	B00297L	BEAUFORT	SAMPLE	32	SEDIMENT	04C	STATION002
69	B00298L	BEAUFORT	SAMPLE	32	SEDIMENT	04C	STATION002
70	B00300L	BEAUFORT	SAMPLE	32	SEDIMENT	04C	STATION002

END FORM
70 STRAINS

Strains isolated from water at 20C showing gray colonies on solid medium.

1	B00002H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
2	B00003H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
3	B00010H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
4	B00051H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
5	B00053H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
6	B00054H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
7	B00055H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
8	B00058H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
9	B00059H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
10	B00060H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
11	B00061H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
12	B00064H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
13	B00065H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
14	B00066H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
15	B00067H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
16	B00068H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
17	B00069H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
18	B00070H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
19	B00072H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
20	B00073H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
21	B00075H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
22	B00101H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
23	B00102H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
24	B00103H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
25	B00104H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
26	B00110H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
27	B00113H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
28	B00114H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
29	B00115H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
30	B00116H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
31	B00118H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
32	B00119H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
33	B00120H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
34	B00121H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
35	B00151H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
36	B00152H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
37	B00153H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
38	B00154H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
39	B00155H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
40	B00156H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
41	B00158H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
42	B00159H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
43	B00160H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
44	B00161H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
45	B00163H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
46	B00164H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
47	B00166H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
48	B00168H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
49	B00169H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
50	B00202H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070

51	B00204H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
52	B00205H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
53	B00206H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
54	B00207H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
55	B00208H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
56	B00210H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
57	B00211H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
58	B00212H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
59	B00213H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
60	B00217H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
61	B00219H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
62	B00221H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
63	B00222H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
64	B00223H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
65	B00251H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
66	B00252H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
67	B00253H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
68	B00254H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
69	B00255H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
70	B00258H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
71	B00259H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
72	B00260H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
73	B00261H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
74	B00262H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
75	B00263H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
76	B00264H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
77	B00265H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
78	B00268H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
79	B00269H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
80	B00270H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
81	B00271H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
82	B00273H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
83	B00275H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030

END FORM
83 STRAINS

Strains isolated from sediment at 20C showing gray colonies on solid medium.

1	B00026H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
2	B00029H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
3	B00030H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
4	B00032H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
5	B00033H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
6	B00038H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
7	B00042H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
8	B00045H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
9	B00086H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
10	B00098H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
11	B00135H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
12	B00141H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
13	B00145H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
14	B00178H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
15	B00179H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
16	B00180H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
17	B00182H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
18	B00184H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
19	B00185H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
20	B00187H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
21	B00188H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
22	B00189H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
23	B00192H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
24	B00193H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
25	B00198H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
26	B00200H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
27	B00230H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
28	B00233H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
29	B00235H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
30	B00237H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
31	B00239H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
32	B00240H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
33	B00241H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
34	B00243H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
35	B00244H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
36	B00249H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
37	B00250H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
38	B00276H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
39	B00283H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
40	B00284H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
41	B00286H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
42	B00287H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
43	B00288H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
44	B00290H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
45	B00295H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030

END FORM
45 STRAINS

Strains isolated from water at 4C producing at least one of the following non-diffusible pigments: white, red, pink, brown, black, green, violet, blue, gold, orange.

1	B00005L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
2	B00006L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
3	B00009L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
4	B00012L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
5	B00014L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
6	B00024L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
7	B00025L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
8	B00051L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
9	B00052L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
10	B00055L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
11	B00057L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
12	B00060L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
13	B00061L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
14	B00062L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
15	B00063L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
16	B00066L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
17	B00068L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
18	B00070L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
19	B00074L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
20	B00101L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
21	B00102L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
22	B00104L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
23	B00105L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
24	B00106L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
25	B00107L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
26	B00108L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
27	B00110L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
28	B00111L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
29	B00112L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
30	B00113L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
31	B00115L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
32	B00116L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
33	B00118L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
34	B00120L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
35	B00121L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
36	B00122L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
37	B00124L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
38	B00125L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
39	B00151L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
40	B00154L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
41	B00155L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
42	B00156L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
43	B00157L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
44	B00159L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
45	B00162L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
46	B00163L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
47	B00165L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
48	B00166L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
49	B00168L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
50	B00169L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055

51	B00170L	BEAUFORT SAMPLE 24 WATER 04C STATION055
52	B00171L	BEAUFORT SAMPLE 24 WATER 04C STATION055
53	B00172L	BEAUFORT SAMPLE 24 WATER 04C STATION055
54	B00173L	BEAUFORT SAMPLE 24 WATER 04C STATION055
55	B00175L	BEAUFORT SAMPLE 24 WATER 04C STATION055
56	B00201L	BEAUFORT SAMPLE 26 WATER 04C STATION070
57	B00203L	BEAUFORT SAMPLE 26 WATER 04C STATION070
58	B00204L	BEAUFORT SAMPLE 26 WATER 04C STATION070
59	B00205L	BEAUFORT SAMPLE 26 WATER 04C STATION070
60	B00206L	BEAUFORT SAMPLE 26 WATER 04C STATION070
61	B00207L	BEAUFORT SAMPLE 26 WATER 04C STATION070
62	B00208L	BEAUFORT SAMPLE 26 WATER 04C STATION070
63	B00209L	BEAUFORT SAMPLE 26 WATER 04C STATION070
64	B00210L	BEAUFORT SAMPLE 26 WATER 04C STATION070
65	B00213L	BEAUFORT SAMPLE 26 WATER 04C STATION070
66	B00214L	BEAUFORT SAMPLE 26 WATER 04C STATION070
67	B00215L	BEAUFORT SAMPLE 26 WATER 04C STATION070
68	B00217L	BEAUFORT SAMPLE 26 WATER 04C STATION070
69	B00218L	BEAUFORT SAMPLE 26 WATER 04C STATION070
70	B00220L	BEAUFORT SAMPLE 26 WATER 04C STATION070
71	B00222L	BEAUFORT SAMPLE 26 WATER 04C STATION070
72	B00223L	BEAUFORT SAMPLE 26 WATER 04C STATION070
73	B00224L	BEAUFORT SAMPLE 26 WATER 04C STATION070
74	B00278L	BEAUFORT SAMPLE 11 WATER 04C STATION030
75	B00280L	BEAUFORT SAMPLE 11 WATER 04C STATION030
76	B00281L	BEAUFORT SAMPLE 19 WATER 04C STATION001
77	B00284L	BEAUFORT SAMPLE 19 WATER 04C STATION001
78	B00291L	BEAUFORT SAMPLE 36 WATER 04C STATION002
79	B00292L	BEAUFORT SAMPLE 36 WATER 04C STATION002

END FORM
79 STRAINS

Strains isolated from sediment at 4C producing any one of the following non-diffusible pigments: white, red, pink, brown, black, green, violet, blue, gold, orange.

1	B00026L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
2	B00027L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
3	B00044L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
4	B00076L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
5	B00079L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
6	B00083L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
7	B00088L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
8	B00138L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
9	B00139L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
10	B00140L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
11	B00141L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
12	B00143L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
13	B00144L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
14	B00145L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
15	B00148L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
16	B00178L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
17	B00179L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
18	B00180L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
19	B00182L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
20	B00183L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
21	B00184L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
22	B00185L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
23	B00186L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
24	B00187L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
25	B00188L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
26	B00190L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
27	B00192L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
28	B00193L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
29	B00194L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
30	B00196L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
31	B00198L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
32	B00199L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
33	B00200L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
34	B00228L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
35	B00230L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
36	B00231L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
37	B00233L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
38	B00234L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
39	B00237L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
40	B00238L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070

41	B00239L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
42	B00240L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
43	B00245L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
44	B00246L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
45	B00247L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
46	B00249L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
47	B00250L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
48	B00254L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
49	B00256L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
50	B00262L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
51	B00263L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
52	B00264L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
53	B00269L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
54	B00274L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
55	B00286L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
56	B00287L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
57	B00288L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
58	B00289L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001

END FORM
58 STRAINS

Strains isolated from water at 20C producing any one of the following non-diffusible pigments: white, red, pink, brown, black, green, violet, blue, gold, orange.

1	B00004H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
2	B00005H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
3	B00006H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
4	B00007H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
5	B00008H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
6	B00011H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
7	B00012H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
8	B00013H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
9	B00014H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
10	B00015H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
11	B00016H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
12	B00017H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
13	B00018H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
14	B00019H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
15	B00020H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
16	B00021H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
17	B00022H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
18	B00023H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
19	B00024H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
20	B00052H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
21	B00056H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
22	B00057H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
23	B00062H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
24	B00063H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
25	B00071H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
26	B00106H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
27	B00111H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
28	B00112H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
29	B00117H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
30	B00122H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
31	B00123H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
32	B00157H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
33	B00165H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
34	B00170H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
35	B00203H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
36	B00216H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
37	B00253H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030

END FORM
37 STRAINS

Strains isolated from sediment at 20C producing any one of the following non-diffusible pigments: white, red, pink, brown, black, green, violet, blue, gold, orange.

1	B00027H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
2	B00028H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
3	B00031H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
4	B00035H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
5	B00036H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
6	B00037H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
7	B00039H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
8	B00044H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
9	B00047H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
10	B00048H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
11	B00076H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
12	B00077H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
13	B00078H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
14	B00084H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
15	B00085H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
16	B00091H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
17	B00095H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
18	B00096H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
19	B00097H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
20	B00126H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
21	B00127H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
22	B00128H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
23	B00129H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
24	B00132H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
25	B00133H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
26	B00136H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
27	B00138H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
28	B00140H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
29	B00142H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
30	B00143H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
31	B00144H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
32	B00146H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
33	B00148H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
34	B00149H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
35	B00150H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
36	B00176H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
37	B00177H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
38	B00181H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
39	B00186H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
40	B00190H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
41	B00194H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
42	B00196H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
43	B00199H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
44	B00226H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
45	B00227H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
46	B00228H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
47	B00229H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
48	B00231H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
49	B00232H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
50	B00234H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070

51	B00242H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
52	B00243H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
53	B00246H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
54	B00247H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
55	B00248H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
56	B00277H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
57	B00278H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
58	B00279H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
59	B00280H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
60	B00285H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
61	B00289H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
62	B00292H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
63	B00296H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
64	B00297H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
65	B00300H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030

END FORM
65 STRAINS

Strains isolated from sediment at 4C producing at least one of the following diffusible pigments: blue, yellow, green, red, orange, violet, brown, black.

1	B00242L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
2	B00260L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
3	B00263L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
4	B00266L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030

END·FORM
4 STRAINS

Strains isolated from water or sediment at 20C producing any diffusible pigment.

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    1   B00186H      BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055

END FORM
      1 STRAINS
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Strains isolated from water at 20C capable of growth at 5C.

1	B00001H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
2	B00002H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
3	B00003H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
4	B00004H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
5	B00005H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
6	B00006H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
7	B00007H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
8	B00008H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
9	B00009H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
10	B00010H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
11	B00011H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
12	B00012H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
13	B00013H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
14	B00014H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
15	B00015H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
16	B00016H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
17	B00017H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
18	B00018H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
19	B00019H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
20	B00020H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
21	B00021H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
22	B00022H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
23	B00023H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
24	B00024H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
25	B00051H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
26	B00052H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
27	B00053H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
28	B00054H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
29	B00055H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
30	B00056H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
31	B00057H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
32	B00058H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
33	B00059H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
34	B00060H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
35	B00061H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
36	B00062H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
37	B00063H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
38	B00064H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
39	B00065H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
40	B00066H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
41	B00067H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
42	B00068H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
43	B00069H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
44	B00070H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
45	B00071H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
46	B00072H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
47	B00073H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
48	B00075H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
49	B00101H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
50	B00102H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071

51	B00103H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
52	B00104H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
53	B00106H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
54	B00109H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
55	B00110H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
56	B00111H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
57	B00112H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
58	B00113H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
59	B00114H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
60	B00115H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
61	B00116H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
62	B00117H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
63	B00118H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
64	B00119H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
65	B00120H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
66	B00121H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
67	B00122H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
68	B00123H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
69	B00151H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
70	B00152H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
71	B00153H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
72	B00154H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
73	B00155H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
74	B00156H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
75	B00157H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
76	B00158H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
77	B00159H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
78	B00160H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
79	B00161H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
80	B00163H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
81	B00164H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
82	B00165H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
83	B00166H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
84	B00168H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
85	B00169H	BEAUFOFT	SAMPLE	24	WATER	20C	STATION055
86	B00170H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
87	B00201H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
88	B00202H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
89	B00204H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
90	B00205H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
91	B00206H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
92	B00207H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
93	B00208H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
94	B00210H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
95	B00211H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
96	B00212H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
97	B00213H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
98	B00216H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
99	B00217H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
100	B00219H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070

101	B00221H	BEAUFORT SAMPLE 26 WATER 20C STATION070
102	B00222H	BEAUFORT SAMPLE 26 WATER 20C STATION070
103	B00223H	BEAUFORT SAMPLE 26 WATER 20C STATION070
104	B00251H	BEAUFORT SAMPLE 11 WATER 20C STATION030
105	B00252H	BEAUFORT SAMPLE 11 WATER 20C STATION030
106	B00253H	BEAUFORT SAMPLE 11 WATER 20C STATION030
107	B00254H	BEAUFORT SAMPLE 11 WATER 20C STATION030
108	B00255H	BEAUFORT SAMPLE 11 WATER 20C STATION030
109	B00256H	BEAUFORT SAMPLE 11 WATER 20C STATION030
110	B00257H	BEAUFORT SAMPLE 11 WATER 20C STATION030
111	B00258H	BEAUFORT SAMPLE 11 WATER 20C STATION030
112	B00259H	BEAUFORT SAMPLE 11 WATER 20C STATION030
113	B00260H	BEAUFORT SAMPLE 11 WATER 20C STATION030
114	B00261H	BEAUFORT SAMPLE 11 WATER 20C STATION030
115	B00262H	BEAUFORT SAMPLE 11 WATER 20C STATION030
116	B00263H	BEAUFORT SAMPLE 11 WATER 20C STATION030
117	B00264H	BEAUFORT SAMPLE 11 WATER 20C STATION030
118	B00265H	BEAUFORT SAMPLE 11 WATER 20C STATION030
119	B00266H	BEAUFORT SAMPLE 11 WATER 20C STATION030
120	B00268H	BEAUFORT SAMPLE 11 WATER 20C STATION030
121	B00269H	BEAUFORT SAMPLE 11 WATER 20C STATION030
122	B00270H	BEAUFORT SAMPLE 11 WATER 20C STATION030
123	B00271H	BEAUFORT SAMPLE 11 WATER 20C STATION030
124	B00272H	BEAUFORT SAMPLE 11 WATER 20C STATION030
125	B00273H	BEAUFORT SAMPLE 11 WATER 20C STATION030
126	B00274H	BEAUFORT SAMPLE 11 WATER 20C STATION030
127	B00275H	BEAUFORT SAMPLE 11 WATER 20C STATION030

END FORM
127 STRAINS

Strains isolated from sediment at 20C capable of growth at 5C.

1	B00026H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
2	B00027H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
3	B00028H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
4	B00029H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
5	B00030H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
6	B00031H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
7	B00032H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
8	B00033H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
9	B00035H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
10	B00036H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
11	B00037H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
12	B00038H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
13	B00039H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
14	B00040H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
15	B00041H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
16	B00042H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
17	B00043H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
18	B00044H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
19	B00045H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
20	B00047H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
21	B00048H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
22	B00076H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
23	B00077H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
24	B00078H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
25	B00079H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
26	B00080H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
27	B00081H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
28	B00082H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
29	B00083H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
30	B00084H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
31	B00085H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
32	B00086H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
33	B00087H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
34	B00088H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
35	B00089H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
36	B00091H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
37	B00092H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
38	B00093H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
39	B00094H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
40	B00095H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
41	B00096H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
42	B00097H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
43	B00098H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
44	B00099H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
45	B00100H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
46	B00126H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
47	B00127H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
48	B00128H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
49	B00129H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
50	B00130H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071

51	B00131H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
52	B00132H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
53	B00133H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
54	B00135H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
55	B00136H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
56	B00138H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
57	B00140H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
58	B00141H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
59	B00142H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
60	B00143H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
61	B00144H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
62	B00145H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
63	B00146H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
64	B00147H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
65	B00148H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
66	B00149H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
67	B00150H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
68	B00176H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
69	B00177H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
70	B00178H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
71	B00179H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
72	B00180H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
73	B00181H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
74	B00183H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
75	B00184H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
76	B00186H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
77	B00187H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
78	B00188H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
79	B00189H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
80	B00190H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
81	B00191H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
82	B00192H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
83	B00194H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
84	B00196H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
85	B00197H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
86	B00198H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
87	B00200H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
88	B00226H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
89	B00227H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
90	B00228H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
91	B00229H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
92	B00230H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
93	B00231H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
94	B00232H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
95	B00233H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
96	B00234H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
97	B00235H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
98	B00236H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
99	B00237H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
100	B00238H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070

101	B00239H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
102	B00240H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
103	B00241H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
104	B00242H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
105	B00243H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
106	B00244H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
107	B00245H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
108	B00246H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
109	B00247H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
110	B00248H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
111	B00249H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
112	B00250H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
113	B00276H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
114	B00277H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
115	B00278H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
116	B00279H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
117	B00280H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
118	B00281H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
119	B00282H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
120	B00283H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
121	B00284H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
122	B00285H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
123	B00286H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
124	B00287H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
125	B00288H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
126	B00289H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
127	B00290H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
128	B00292H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
129	B00293H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
130	B00294H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
131	B00295H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
132	B00296H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
133	B00297H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
134	B00298H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
135	B00299H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
136	B00300H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030

END FORM
136 STRAINS

Strains isolated from water at 4C capable of growth at 10C.

1	B00003L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
2	B00005L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
3	B00006L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
4	B00009L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
5	B00012L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
6	B00013L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
7	B00014L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
8	B00015L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
9	B00021L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
10	B00022L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
11	B00023L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
12	B00024L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
13	B00025L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
14	B00052L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
15	B00053L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
16	B00054L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
17	B00055L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
18	B00057L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
19	B00058L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
20	B00059L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
21	B00060L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
22	B00061L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
23	B00062L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
24	B00063L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
25	B00066L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
26	B00067L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
27	B00068L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
28	B00069L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
29	B00070L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
30	B00071L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
31	B00072L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
32	B00073L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
33	B00074L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
34	B00075L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
35	B00101L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
36	B00102L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
37	B00103L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
38	B00104L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
39	B00105L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
40	B00106L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
41	B00107L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
42	B00108L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
43	B00109L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
44	B00110L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
45	B00111L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
46	B00112L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
47	B00113L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
48	B00114L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
49	B00115L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
50	B00116L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071

51	B00117L	BEAUFORT SAMPLE 27 WATER 04C STATION071
52	B00118L	BEAUFORT SAMPLE 27 WATER 04C STATION071
53	B00119L	BEAUFORT SAMPLE 27 WATER 04C STATION071
54	B00120L	BEAUFORT SAMPLE 27 WATER 04C STATION071
55	B00121L	BEAUFORT SAMPLE 27 WATER 04C STATION071
56	B00122L	BEAUFORT SAMPLE 27 WATER 04C STATION071
57	B00123L	BEAUFORT SAMPLE 27 WATER 04C STATION071
58	B00124L	BEAUFORT SAMPLE 27 WATER 04C STATION071
59	B00125L	BEAUFORT SAMPLE 27 WATER 04C STATION071
60	B00151L	BEAUFORT SAMPLE 24 WATER 04C STATION055
61	B00152L	BEAUFORT SAMPLE 24 WATER 04C STATION055
62	B00153L	BEAUFORT SAMPLE 24 WATER 04C STATION055
63	B00154L	BEAUFORT SAMPLE 24 WATER 04C STATION055
64	B00155L	BEAUFORT SAMPLE 24 WATER 04C STATION055
65	B00156L	BEAUFORT SAMPLE 24 WATER 04C STATION055
66	B00157L	BEAUFORT SAMPLE 24 WATER 04C STATION055
67	B00159L	BEAUFORT SAMPLE 24 WATER 04C STATION055
68	B00160L	BEAUFORT SAMPLE 24 WATER 04C STATION055
69	B00162L	BEAUFORT SAMPLE 24 WATER 04C STATION055
70	B00163L	BEAUFORT SAMPLE 24 WATER 04C STATION055
71	B00164L	BEAUFORT SAMPLE 24 WATER 04C STATION055
72	B00165L	BEAUFORT SAMPLE 24 WATER 04C STATION055
73	B00166L	BEAUFORT SAMPLE 24 WATER 04C STATION055
74	B00167L	BEAUFORT SAMPLE 24 WATER 04C STATION055
75	B00168L	BEAUFORT SAMPLE 24 WATER 04C STATION055
76	B00169L	BEAUFORT SAMPLE 24 WATER 04C STATION055
77	B00170L	BEAUFORT SAMPLE 24 WATER 04C STATION055
78	B00171L	BEAUFORT SAMPLE 24 WATER 04C STATION055
79	B00172L	BEAUFORT SAMPLE 24 WATER 04C STATION055
80	B00173L	BEAUFORT SAMPLE 24 WATER 04C STATION055
81	B00174L	BEAUFORT SAMPLE 24 WATER 04C STATION055
82	B00175L	BEAUFORT SAMPLE 24 WATER 04C STATION055
83	B00201L	BEAUFORT SAMPLE 26 WATER 04C STATION070
84	B00202L	BEAUFORT SAMPLE 26 WATER 04C STATION070
85	B00203L	BEAUFORT SAMPLE 26 WATER 04C STATION070
86	B00205L	BEAUFORT SAMPLE 26 WATER 04C STATION070
87	B00206L	BEAUFORT SAMPLE 26 WATER 04C STATION070
88	B00207L	BEAUFORT SAMPLE 26 WATER 04C STATION070
89	B00208L	BEAUFORT SAMPLE 26 WATER 04C STATION070
90	B00209L	BEAUFORT SAMPLE 26 WATER 04C STATION070
91	B00210L	BEAUFORT SAMPLE 26 WATER 04C STATION070
92	B00211L	BEAUFORT SAMPLE 26 WATER 04C STATION070
93	B00212L	BEAUFORT SAMPLE 26 WATER 04C STATION070
94	B00213L	BEAUFORT SAMPLE 26 WATER 04C STATION070
95	B00214L	BEAUFORT SAMPLE 26 WATER 04C STATION070
96	B00215L	BEAUFORT SAMPLE 26 WATER 04C STATION070
97	B00216L	BEAUFORT SAMPLE 26 WATER 04C STATION070
98	B00217L	BEAUFORT SAMPLE 26 WATER 04C STATION070
99	B00218L	BEAUFORT SAMPLE 26 WATER 04C STATION070
100	B00219L	BEAUFORT SAMPLE 26 WATER 04C STATION070

101	B00220L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
102	B00221L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
103	B00222L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
104	B00223L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
105	B00224L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
106	B00225L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
107	B00278L	BEAUFORT	SAMPLE	11	WATER	04C	STATION030
108	B00280L	BEAUFORT	SAMPLE	11	WATER	04C	STATION030
109	B00281L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
110	B00282L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
111	B00283L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
112	B00284L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
113	B00291L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002
114	B00292L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002
115	B00294L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002
116	B00295L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002

END FORM
116 STRAINS

Strains isolated from sediment at 4C capable of growth at 10C.

1	B00026L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
2	B00027L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
3	B00028L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
4	B00029L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
5	B00030L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
6	B00031L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
7	B00032L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
8	B00033L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
9	B00034L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
10	B00035L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
11	B00036L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
12	B00037L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
13	B00038L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
14	B00039L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
15	B00040L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
16	B00041L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
17	B00042L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
18	B00043L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
19	B00044L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
20	B00046L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
21	B00047L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
22	B00048L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
23	B00049L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
24	B00050L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
25	B00076L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
26	B00077L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
27	B00078L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
28	B00079L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
29	B00080L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
30	B00081L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
31	B00082L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
32	B00083L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
33	B00084L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
34	B00085L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
35	B00086L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
36	B00087L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
37	B00088L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
38	B00089L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
39	B00091L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
40	B00092L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
41	B00093L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
42	B00094L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
43	B00095L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
44	B00096L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
45	B00097L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
46	B00098L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
47	B00099L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
48	B00100L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
49	B00126L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
50	B00127L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071

51	B00128L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
52	B00129L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
53	B00130L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
54	B00131L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
55	B00132L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
56	B00133L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
57	B00134L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
58	B00135L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
59	B00136L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
60	B00137L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
61	B00138L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
62	B00139L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
63	B00140L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
64	B00141L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
65	B00143L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
66	B00144L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
67	B00145L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
68	B00146L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
69	B00147L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
70	B00148L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
71	B00149L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
72	B00150L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
73	B00176L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
74	B00177L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
75	B00178L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
76	B00179L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
77	B00180L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
78	B00181L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
79	B00182L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
80	B00183L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
81	B00184L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
82	B00185L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
83	B00186L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
84	B00187L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
85	B00188L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
86	B00189L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
87	B00190L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
88	B00191L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
89	B00192L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
90	B00194L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
91	B00195L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
92	B00196L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
93	B00197L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
94	B00198L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
95	B00199L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
96	B00200L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
97	B00226L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
98	B00227L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
99	B00228L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
100	B00229L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070

101	B00230L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
102	B00232L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
103	B00233L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
104	B00234L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
105	B00235L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
106	B00236L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
107	B00237L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
108	B00238L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
109	B00239L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
110	B00240L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
111	B00241L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
112	B00242L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
113	B00243L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
114	B00244L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
115	B00245L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
116	B00246L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
117	B00247L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
118	B00248L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
119	B00249L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
120	B00250L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
121	B00251L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
122	B00252L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
123	B00253L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
124	B00254L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
125	B00256L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
126	B00257L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
127	B00258L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
128	B00259L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
129	B00261L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
130	B00262L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
131	B00263L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
132	B00264L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
133	B00265L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
134	B00266L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
135	B00267L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
136	B00268L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
137	B00269L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
138	B00271L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
139	B00272L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
140	B00273L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
141	B00274L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
142	B00275L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
143	B00286L	BEAUFORT SAMPLE 15 SEDIMENT 04C STATION001
144	B00287L	BEAUFORT SAMPLE 15 SEDIMENT 04C STATION001
145	B00288L	BEAUFORT SAMPLE 15 SEDIMENT 04C STATION001
146	B00289L	BEAUFORT SAMPLE 15 SEDIMENT 04C STATION001
147	B00290L	BEAUFORT SAMPLE 15 SEDIMENT 04C STATION001
148	B00296L	BEAUFORT SAMPLE 32 SEDIMENT 04C STATION002
149	B00297L	BEAUFORT SAMPLE 32 SEDIMENT 04C STATION002
150	B00298L	BEAUFORT SAMPLE 32 SEDIMENT 04C STATION002
151	B00299L	BEAUFORT SAMPLE 32 SEDIMENT 04C STATION002
152	B00300L	BEAUFORT SAMPLE 32 SEDIMENT 04C STATION002

END FORM
152 STRAINS

Strains isolated from water at 20C capable of growth at 10C.

1	B00001H	BEAUFORT SAMPLE 03 WATER 20C STATION010
2	B00002H	BEAUFORT SAMPLE 03 WATER 20C STATION010
3	B00003H	BEAUFORT SAMPLE 03 WATER 20C STATION010
4	B00004H	BEAUFORT SAMPLE 03 WATER 20C STATION010
5	B00005H	BEAUFORT SAMPLE 03 WATER 20C STATION010
6	B00006H	BEAUFORT SAMPLE 03 WATER 20C STATION010
7	B00007H	BEAUFORT SAMPLE 03 WATER 20C STATION010
8	B00008H	BEAUFORT SAMPLE 03 WATER 20C STATION010
9	B00009H	BEAUFORT SAMPLE 03 WATER 20C STATION010
10	B00010H	BEAUFORT SAMPLE 03 WATER 20C STATION010
11	B00011H	BEAUFORT SAMPLE 03 WATER 20C STATION010
12	B00012H	BEAUFORT SAMPLE 03 WATER 20C STATION010
13	B00013H	BEAUFORT SAMPLE 03 WATER 20C STATION010
14	B00014H	BEAUFORT SAMPLE 03 WATER 20C STATION010
15	B00015H	BEAUFORT SAMPLE 03 WATER 20C STATION010
16	B00016H	BEAUFORT SAMPLE 03 WATER 20C STATION010
17	B00017H	BEAUFORT SAMPLE 03 WATER 20C STATION010
18	B00018H	BEAUFORT SAMPLE 03 WATER 20C STATION010
19	B00019H	BEAUFORT SAMPLE 03 WATER 20C STATION010
20	B00020H	BEAUFORT SAMPLE 03 WATER 20C STATION010
21	B00021H	BEAUFORT SAMPLE 03 WATER 20C STATION010
22	B00022H	BEAUFORT SAMPLE 03 WATER 20C STATION010
23	B00023H	BEAUFORT SAMPLE 03 WATER 20C STATION010
24	B00024H	BEAUFORT SAMPLE 03 WATER 20C STATION010
25	B00051H	BEAUFORT SAMPLE 20 WATER 20C STATION020
26	B00052H	BEAUFORT SAMPLE 20 WATER 20C STATION020
27	B00053H	BEAUFORT SAMPLE 20 WATER 20C STATION020
28	B00054H	BEAUFORT SAMPLE 20 WATER 20C STATION020
29	B00055H	BEAUFORT SAMPLE 20 WATER 20C STATION020
30	B00056H	BEAUFORT SAMPLE 20 WATER 20C STATION020
31	B00057H	BEAUFORT SAMPLE 20 WATER 20C STATION020
32	B00058H	BEAUFORT SAMPLE 20 WATER 20C STATION002
33	B00059H	BEAUFORT SAMPLE 20 WATER 20C STATION002
34	B00060H	BEAUFORT SAMPLE 20 WATER 20C STATION002
35	B00061H	BEAUFORT SAMPLE 20 WATER 20C STATION002
36	B00062H	BEAUFORT SAMPLE 20 WATER 20C STATION002
37	B00063H	BEAUFORT SAMPLE 20 WATER 20C STATION002
38	B00064H	BEAUFORT SAMPLE 20 WATER 20C STATION002
39	B00065H	BEAUFORT SAMPLE 20 WATER 20C STATION002
40	B00066H	BEAUFORT SAMPLE 20 WATER 20C STATION002
41	B00067H	BEAUFORT SAMPLE 20 WATER 20C STATION002
42	B00068H	BEAUFORT SAMPLE 20 WATER 20C STATION002
43	B00069H	BEAUFORT SAMPLE 20 WATER 20C STATION002
44	B00070H	BEAUFORT SAMPLE 20 WATER 20C STATION002
45	B00071H	BEAUFORT SAMPLE 20 WATER 20C STATION002
46	B00072H	BEAUFORT SAMPLE 20 WATER 20C STATION002
47	B00073H	BEAUFORT SAMPLE 20 WATER 20C STATION002
48	B00075H	BEAUFORT SAMPLE 20 WATER 20C STATION002
49	B00101H	BEAUFORT SAMPLE 27 WATER 20C STATION071
50	B00102H	BEAUFORT SAMPLE 27 WATER 20C STATION071

51	B00103H	BEAUFORT SAMPLE 27 WATER 20C STATION071
52	B00104H	BEAUFORT SAMPLE 27 WATER 20C STATION071
53	B00106H	BEAUFORT SAMPLE 27 WATER 20C STATION071
54	B00109H	BEAUFORT SAMPLE 27 WATER 20C STATION071
55	B00110H	BEAUFORT SAMPLE 27 WATER 20C STATION071
56	B00112H	BEAUFORT SAMPLE 27 WATER 20C STATION071
57	B00113H	BEAUFORT SAMPLE 27 WATER 20C STATION071
58	B00114H	BEAUFORT SAMPLE 27 WATER 20C STATION071
59	B00115H	BEAUFORT SAMPLE 27 WATER 20C STATION071
60	B00116H	BEAUFORT SAMPLE 27 WATER 20C STATION071
61	B00117H	BEAUFORT SAMPLE 27 WATER 20C STATION071
62	B00118H	BEAUFORT SAMPLE 27 WATER 20C STATION071
63	B00119H	BEAUFORT SAMPLE 27 WATER 20C STATION071
64	B00120H	BEAUFORT SAMPLE 27 WATER 20C STATION071
65	B00121H	BEAUFORT SAMPLE 27 WATER 20C STATION071
66	B00122H	BEAUFORT SAMPLE 27 WATER 20C STATION071
67	B00123H	BEAUFORT SAMPLE 27 WATER 20C STATION071
68	B00151H	BEAUFORT SAMPLE 24 WATER 20C STATION055
69	B00152H	BEAUFORT SAMPLE 24 WATER 20C STATION055
70	B00153H	BEAUFORT SAMPLE 24 WATER 20C STATION055
71	B00154H	BEAUFORT SAMPLE 24 WATER 20C STATION055
72	B00155H	BEAUFORT SAMPLE 24 WATER 20C STATION055
73	B00156H	BEAUFORT SAMPLE 24 WATER 20C STATION055
74	B00157H	BEAUFORT SAMPLE 24 WATER 20C STATION055
75	B00158H	BEAUFORT SAMPLE 24 WATER 20C STATION055
76	B00159H	BEAUFORT SAMPLE 24 WATER 20C STATION055
77	B00160H	BEAUFORT SAMPLE 24 WATER 20C STATION055
78	B00161H	BEAUFORT SAMPLE 24 WATER 20C STATION055
79	B00163H	BEAUFORT SAMPLE 24 WATER 20C STATION055
80	B00164H	BEAUFORT SAMPLE 24 WATER 20C STATION055
81	B00165H	BEAUFORT SAMPLE 24 WATER 20C STATION055
82	B00166H	BEAUFORT SAMPLE 24 WATER 20C STATION055
83	B00168H	BEAUFORT SAMPLE 24 WATER 20C STATION055
84	B00169H	BEAUFORT SAMPLE 24 WATER 20C STATION055
85	B00170H	BEAUFORT SAMPLE 24 WATER 20C STATION055
86	B00201H	BEAUFORT SAMPLE 26 WATER 20C STATION070
87	B00202H	BEAUFORT SAMPLE 26 WATER 20C STATION070
88	B00203H	BEAUFORT SAMPLE 26 WATER 20C STATION070
89	B00204H	BEAUFORT SAMPLE 26 WATER 20C STATION070
90	B00205H	BEAUFORT SAMPLE 26 WATER 20C STATION070
91	B00206H	BEAUFORT SAMPLE 26 WATER 20C STATION070
92	B00207H	BEAUFORT SAMPLE 26 WATER 20C STATION070
93	B00208H	BEAUFORT SAMPLE 26 WATER 20C STATION070
94	B00210H	BEAUFORT SAMPLE 26 WATER 20C STATION070
95	B00211H	BEAUFORT SAMPLE 26 WATER 20C STATION070
96	B00212H	BEAUFORT SAMPLE 26 WATER 20C STATION070
97	B00213H	BEAUFORT SAMPLE 26 WATER 20C STATION070
98	B00216H	BEAUFORT SAMPLE 26 WATER 20C STATION070
99	B00217H	BEAUFORT SAMPLE 26 WATER 20C STATION070
100	B00219H	BEAUFORT SAMPLE 26 WATER 20C STATION070

101	B00220H	BEAUFORT SAMPLE 26 WATER 20C STATION070
102	B00221H	BEAUFORT SAMPLE 26 WATER 20C STATION070
103	B00222H	BEAUFORT SAMPLE 26 WATER 20C STATION070
104	B00223H	BEAUFORT SAMPLE 26 WATER 20C STATION070
105	B00251H	BEAUFORT SAMPLE 11 WATER 20C STATION030
106	B00252H	BEAUFORT SAMPLE 11 WATER 20C STATION030
107	B00253H	BEAUFORT SAMPLE 11 WATER 20C STATION030
108	B00254H	BEAUFORT SAMPLE 11 WATER 20C STATION030
109	B00255H	BEAUFORT SAMPLE 11 WATER 20C STATION030
110	B00256H	BEAUFORT SAMPLE 11 WATER 20C STATION030
111	B00257H	BEAUFORT SAMPLE 11 WATER 20C STATION030
112	B00258H	BEAUFORT SAMPLE 11 WATER 20C STATION030
113	B00259H	BEAUFORT SAMPLE 11 WATER 20C STATION030
114	B00260H	BEAUFORT SAMPLE 11 WATER 20C STATION030
115	B00261H	BEAUFORT SAMPLE 11 WATER 20C STATION030
116	B00262H	BEAUFORT SAMPLE 11 WATER 20C STATION030
117	B00263H	BEAUFORT SAMPLE 11 WATER 20C STATION030
118	B00264H	BEAUFORT SAMPLE 11 WATER 20C STATION030
119	B00265H	BEAUFORT SAMPLE 11 WATER 20C STATION030
120	B00266H	BEAUFORT SAMPLE 11 WATER 20C STATION030
121	B00268H	BEAUFORT SAMPLE 11 WATER 20C STATION030
122	B00269H	BEAUFORT SAMPLE 11 WATER 20C STATION030
123	B00270H	BEAUFORT SAMPLE 11 WATER 20C STATION030
124	B00271H	BEAUFORT SAMPLE 11 WATER 20C STATION030
125	B00272H	BEAUFORT SAMPLE 11 WATER 20C STATION030
126	B00273H	BEAUFORT SAMPLE 11 WATER 20C STATION030
127	B00275H	BEAUFORT SAMPLE 11 WATER 20C STATION030

END FORM
127 STRAINS

Strains isolated from sediment at 20C capable of growth at 10C.

1	B00026H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
2	B00027H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
3	B00028H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
4	B00029H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
5	B00030H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
6	B00031H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
7	B00032H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
8	B00033H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
9	B00035H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
10	B00036H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
11	B00037H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
12	B00038H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
13	B00039H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
14	B00040H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
15	B00041H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
16	B00042H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
17	B00043H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
18	B00044H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
19	B00045H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
20	B00047H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
21	B00048H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
22	B00076H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
23	B00077H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
24	B00078H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
25	B00079H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
26	B00080H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
27	B00081H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
28	B00082H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
29	B00083H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
30	B00084H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
31	B00085H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
32	B00086H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
33	B00087H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
34	B00088H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
35	B00089H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
36	B00091H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
37	B00092H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
38	B00093H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
39	B00094H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
40	B00095H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
41	B00096H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
42	B00097H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
43	B00098H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
44	B00099H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
45	B00100H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
46	B0016	
		◇AUFORT SAMPLE 22 SEDIMENT 20C STATION071
47	B00127H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
48	B00128H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
49	B00129H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071

50	B00130H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
51	B00131H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
52	B00132H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
53	B00133H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
54	B00135H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
55	B00136H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
56	B00138H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
57	B00139H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
58	B00140H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
59	B00141H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
60	B00142H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
61	B00143H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
62	B00144H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
63	B00145H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
64	B00146H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
65	B00147H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
66	B00148H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
67	B00149H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
68	B00150H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
69	B00176H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
70	B00177H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
71	B00178H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
72	B00179H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
73	B00180H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
74	B00181H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
75	B00183H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
76	B00184H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
77	B00185H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
78	B00186H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
79	B00187H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
80	B00188H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
81	B00189H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
82	B00190H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
83	B00191H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
84	B00192H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
85	B00193H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
86	B00194H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
87	B00196H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
88	B00197H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
89	B00198H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
90	B00199H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
91	B00200H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
92	B00226H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
93	B00227H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
94	B00228H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
95	B00229H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
96	B00230H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
97	B00231H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
98	B00232H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
99	B00233H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
100	B00234H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070

101	B00235H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
102	B00236H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
103	B00237H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
104	B00238H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
105	B00239H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
106	B00240H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
107	B00241H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
108	B00242H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
109	B00243H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
110	B00244H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
111	B00245H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
112	B00246H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
113	B00247H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
114	B00248H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
115	B00249H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
116	B00250H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
117	B00276H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
118	B00277H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
119	B00278H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
120	B00279H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
121	B00280H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
122	B00281H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
123	B00282H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
124	B00283H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
125	B00284H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
126	B00285H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
127	B00286H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
128	B00287H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
129	B00288H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
130	B00289H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
131	B00290H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
132	B00292H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
133	B00293H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
134	B00294H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
135	B00295H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
136	B00296H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
137	B00297H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
138	B00298H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
139	B00299H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
140	B00300H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030

END FORM
140 STRAINS

Strains isolated from water at 4C capable of growth at 15C.

1	B00003L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
2	B00005L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
3	B00006L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
4	B00009L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
5	B00012L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
6	B00013L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
7	B00014L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
8	B00015L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
9	B00021L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
10	B00022L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
11	B00023L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
12	B00024L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
13	B00025L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
14	B00052L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
15	B00053L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
16	B00054L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
17	B00055L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
18	B00057L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
19	B00058L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
20	B00059L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
21	B00060L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
22	B00061L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
23	B00062L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
24	B00063L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
25	B00066L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
26	B00067L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
27	B00068L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
28	B00069L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
29	B00070L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
30	B00071L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
31	B00072L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
32	B00073L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
33	B00074L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
34	B00075L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
35	B00101L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
36	B00102L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
37	B00103L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
38	B00104L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
39	B00105L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
40	B00106L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
41	B00107L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
42	B00108L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
43	B00109L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
44	B00110L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
45	B00111L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
46	B00112L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
47	B00113L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
48	B00114L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
49	B00115L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
50	B00116L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071

51	B00117L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
52	B00118L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
53	B00119L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
54	B00120L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
55	B00121L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
56	B00122L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
57	B00123L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
58	B00124L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
59	B00125L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
60	B00151L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
61	B00152L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
62	B00153L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
63	B00154L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
64	B00155L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
65	B00156L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
66	B00157L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
67	B00159L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
68	B00160L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
69	B00162L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
70	B00163L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
71	B00164L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
72	B00165L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
73	B00166L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
74	B00167L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
75	B00168L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
76	B00169L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
77	B00170L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
78	B00171L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
79	B00172L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
80	B00173L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
81	B00174L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
82	B00175L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
83	B00201L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
84	B00202L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
85	B00203L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
86	B00204L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
87	B00205L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
88	B00206L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
89	B00207L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
90	B00208L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
91	B00209L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
92	B00210L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
93	B00211L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
94	B00212L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
95	B00213L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
96	B00214L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
97	B00215L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
98	B00216L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
99	B00217L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
100	B00218L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070

101	B00219L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
102	B00220L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
103	B00221L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
104	B00222L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
105	B00223L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
106	B00225L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
107	B00278L	BEAUFORT	SAMPLE	11	WATER	04C	STATION030
108	B00281L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
109	B00282L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
110	B00283L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
111	B00284L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
112	B00291L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002
113	B00292L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002
114	B00294L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002
115	B00295L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002

END FORM
115 STRAINS

Strains isolated from sediment at 4C capable of growth at 15C.

1	B00026L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
2	B00027L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
3	B00028L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
4	B00029L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
5	B00030L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
6	B00031L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
7	B00032L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
8	B00033L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
9	B00035L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
10	B00036L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
11	B00037L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
12	B00038L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
13	B00039L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
14	B00040L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
15	B00041L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
16	B00042L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
17	B00043L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
18	B00044L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
19	B00046L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
20	B00047L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
21	B00048L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
22	B00049L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
23	B00050L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
24	B00076L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
25	B00077L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
26	B00078L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
27	B00079L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
28	B00080L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
29	B00081L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
30	B00082L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
31	B00083L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
32	B00084L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
33	B00085L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
34	B00086L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
35	B00087L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
36	B00088L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
37	B00089L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
38	B00091L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
39	B00092L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
40	B00093L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
41	B00094L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
42	B00095L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
43	B00096L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
44	B00097L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
45	B00098L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
46	B00099L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
47	B00100L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
48	B00126L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
49	B00127L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
50	B00128L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071

51	B00129L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
52	B00130L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
53	B00131L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
54	B00132L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
55	B00133L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
56	B00134L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
57	B00135L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
58	B00136L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
59	B00137L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
60	B00138L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
61	B00139L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
62	B00140L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
63	B00141L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
64	B00143L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
65	B00144L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
66	B00145L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
67	B00146L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
68	B00147L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
69	B00148L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
70	B00149L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
71	B00150L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
72	B00176L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
73	B00177L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
74	B00178L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
75	B00179L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
76	B00180L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
77	B00181L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
78	B00182L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
79	B00183L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
80	B00184L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
81	B00185L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
82	B00186L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
83	B00187L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
84	B00188L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
85	B00189L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
86	B00190L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
87	B00191L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
88	B00192L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
89	B00194L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
90	B00195L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
91	B00196L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
92	B00197L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
93	B00198L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
94	B00199L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
95	B00200L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
96	B00226L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
97	B00227L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
98	B00228L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
99	B00229L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
100	B00230L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
101	B00231L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
102	B00232L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
103	B00233L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
104	B00234L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
105	B00235L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
106	B00236L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
107	B00237L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
108	B00238L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
109	B00239L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
110	B00240L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070

111	B00241L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
112	B00242L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
113	B00243L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
114	B00244L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
115	B00245L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
116	B00246L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
117	B00247L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
118	B00248L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
119	B00249L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
120	B00250L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
121	B00251L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
122	B00252L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
123	B00253L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
124	B00254L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
125	B00256L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
126	B00257L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
127	B00258L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
128	B00259L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
129	B00261L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
130	B00262L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
131	B00263L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
132	B00264L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
133	B00265L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
134	B00266L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
135	B00267L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
136	B00268L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
137	B00269L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
138	B00271L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
139	B00272L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
140	B00273L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
141	B00274L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
142	B00275L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
143	B00286L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
144	B00287L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
145	B00288L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
146	B00289L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
147	B00290L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
148	B00296L	BEAUFORT	SAMPLE	32	SEDIMENT	04C	STATION002
149	B00297L	BEAUFORT	SAMPLE	32	SEDIMENT	04C	STATION002
150	B00298L	BEAUFORT	SAMPLE	32	SEDIMENT	04C	STATION002
151	B00299L	BEAUFORT	SAMPLE	32	SEDIMENT	04C	STATION002

END FORM
151 STRAINS

Strains isolated from water at 20C capable of growth at 15C.

1	B00001H	BEAUFORT SAMPLE 03 WATER 20C STATION010
2	B00002H	BEAUFORT SAMPLE 03 WATER 20C STATION010
3	B00003H	BEAUFORT SAMPLE 03 WATER 20C STATION010
4	B00004H	BEAUFORT SAMPLE 03 WATER 20C STATION010
5	B00005H	BEAUFORT SAMPLE 03 WATER 20C STATION010
6	B00006H	BEAUFRT SAMPLE 03 WATER 20C STATION010
7	B00007H	BEAUFORT SAMPLE 03 WATER 20C STATION010
8	B00008H	BEAUFORT SAMPLE 03 WATER 20C STATION010
9	B00009H	BEAUFORT SAMPLE 03 WATER 20C STATION010
10	B00010H	BEAUFORT SAMPLE 03 WATER 20C STATION010
11	B00011H	BEAUFORT SAMPLE 03 WATER 20C STATION010
12	B00012H	BEAUFORT SAMPLE 03 WATER 20C STATION010
13	B00013H	BEAUFORT SAMPLE 03 WATER 20C STATION010
14	B00014H	BEAUFORT SAMPLE 03 WATER 20C STATION010
15	B00015H	BEAUFORT SAMPLE 03 WATER 20C STATION010
16	B00016H	BEAUFORT SAMPLE 03 WATER 20C STATION010
17	B00017H	BEAUFORT SAMPLE 03 WATER 20C STATION010
18	B00018H	BEAUFORT SAMPLE 03 WATER 20C STATION010
19	B00019H	BEAUFORT SAMPLE 03 WATER 20C STATION010
20	B00020H	BEAUFORT SAMPLE 03 WATER 20C STATION010
21	B00021H	BEAUFORT SAMPLE 03 WATER 20C STATION010
22	B00022H	BEAUFORT SAMPLE 03 WATER 20C STATION010
23	B00023H	BEAUFORT SAMPLE 03 WATER 20C STATION010
24	B00024H	BEAUFORT SAMPLE 03 WATER 20C STATION010
25	B00051H	BEAUFORT SAMPLE 20 WATER 20C STATION020
26	B00052H	BEAUFORT SAMPLE 20 WATER 20C STATION020
27	B00053H	BEAUFORT SAMPLE 20 WATER 20C STATION020
28	B00054H	BEAUFORT SAMPLE 20 WATER 20C STATION020
29	B00055H	BEAUFORT SAMPLE 20 WATER 20C STATION020
30	B00056H	BEAUFORT SAMPLE 20 WATER 20C STATION020
31	B00057H	BEAUFORT SAMPLE 20 WATER 20C STATION020
32	B00058H	BEAUFORT SAMPLE 20 WATER 20C STATION002
33	B00059H	BEAUFORT SAMPLE 20 WATER 20C STATION002
34	B00060H	BEAUFORT SAMPLE 20 WATER 20C STATION002
35	B00061H	BEAUFORT SAMPLE 20 WATER 20C STATION002
36	B00062H	BEAUFORT SAMPLE 20 WATER 20C STATION002
37	B00063H	BEAUFORT SAMPLE 20 WATER 20C STATION002
38	B00064H	BEAUFORT SAMPLE 20 WATER 20C STATION002
39	B00065H	BEAUFORT SAMPLE 20 WATER 20C STATION002
40	B00066H	BEAUFORT SAMPLE 20 WATER 20C STATION002
41	B00067H	BEAUFORT SAMPLE 20 WATER 20C STATION002
42	B00068H	BEAUFORT SAMPLE 20 WATER 20C STATION002
43	B00069H	BEAUFORT SAMPLE 20 WATER 20C STATION002
44	B00070H	BEAUFORT SAMPLE 20 WATER 20C STATION002
45	B00071H	BEAUFORT SAMPLE 20 WATER 20C STATION002
46	B00072H	BEAUFORT SAMPLE 20 WATER 20C STATION002
47	B00073H	BEAUFORT SAMPLE 20 WATER 20C STATION002
48	B00075H	BEAUFORT SAMPLE 20 WATER 20C STATION002
49	B00101H	BEAUFORT SAMPLE 27 WATER 20C STATION071
50	B00102H	BEAUFORT SAMPLE 27 WATER 20C STATION071

51	B00103H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
52	B00104H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
53	B00106H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
54	B00109H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
55	B00110H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
56	B00111H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
57	B00112H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
58	B00113H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
59	B00114H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
60	B00115H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
61	B00116H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
62	B00117H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
63	B00118H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
64	B00119H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
65	B00120H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
66	B00121H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
67	B00122H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
68	B00123H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
69	B00151H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
70	B00152H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
71	B00153H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
72	B00154H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
73	B00155H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
74	B00156H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
75	B00157H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
76	B00158H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
77	B00159H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
78	B00160H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
79	B00161H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
80	B00162H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
81	B00163H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
82	B00164H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
83	B00165H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
84	B00166H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
85	B00168H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
86	B00169H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
87	B00170H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
88	B00201H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
89	B00202H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
90	B00203H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
91	B00204H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
92	B00205H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
93	B00206H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
94	B00207H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
95	B00208H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
96	B00210H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
97	B00211H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
98	B00212H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
99	B00213H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
100	B00216H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070

101	B00217H	BEAUFORT SAMPLE 26 WATER 20C STATION070
102	B00219H	BEAUFORT SAMPLE 26 WATER 20C STATION070
103	B00221H	BEAUFORT SAMPLE 26 WATER 20C STATION070
104	B00222H	BEAUFORT SAMPLE 26 WATER 20C STATION070
105	B00223H	BEAUFORT SAMPLE 26 WATER 20C STATION070
106	B00251H	BEAUFORT SAMPLE 11 WATER 20C STATION030
107	B00252H	BEAUFORT SAMPLE 11 WATER 20C STATION030
108	B00253H	BEAUFORT SAMPLE 11 WATER 20C STATION030
109	B00254H	BEAUFORT SAMPLE 11 WATER 20C STATION030
110	B00255H	BEAUFORT SAMPLE 11 WATER 20C STATION030
111	B00256H	BEAUFORT SAMPLE 11 WATER 20C STATION030
112	B00257H	BEAUFORT SAMPLE 11 WATER 20C STATION030
113	B00258H	BEAUFORT SAMPLE 11 WATER 20C STATION030
114	B00259H	BEAUFORT SAMPLE 11 WATER 20C STATION030
115	B00260H	BEAUFORT SAMPLE 11 WATER 20C STATION030
116	B00261H	BEAUFORT SAMPLE 11 WATER 20C STATION030
117	B00262H	BEAUFORT SAMPLE 11 WATER 20C STATION030
118	B00263H	BEAUFORT SAMPLE 11 WATER 20C STATION030
119	B00264H	BEAUFORT SAMPLE 11 WATER 20C STATION030
120	B00265H	BEAUFORT SAMPLE 11 WATER 20C STATION030
121	B00266H	BEAUFORT SAMPLE 11 WATER 20C STATION030
122	B00268H	BEAUFORT SAMPLE 11 WATER 20C STATION030
123	B00269H	BEAUFORT SAMPLE 11 WATER 20C STATION030
124	B00270H	BEAUFORT SAMPLE 11 WATER 20C STATION030
125	B00271H	BEAUFORT SAMPLE 11 WATER 20C STATION030
126	B00272H	BEAUFORT SAMPLE 11 WATER 20C STATION030
127	B00273H	BEAUFORT SAMPLE 11 WATER 20C STATION030
128	B00275H	BEAUFORT SAMPLE 11 WATER 20C STATION030

END FORM
128 STRAINS

Strains isolated from sediment at 20C capable of growth at 15C.

1	B00026H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
2	B00027H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
3	B00028H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
4	B00029H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
5	B00030H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
6	B00031H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
7	B00032H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
8	B00033H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
9	B00037H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
10	B00038H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
11	B00039H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
12	B00040H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
13	B00041H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
14	B00042H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
15	B00043H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
16	B00044H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
17	B00045H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
18	B00047H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
19	B00048H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
20	B00076H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
21	B00077H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
22	B00078H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
23	B00079H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
24	B00080H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
25	B00081H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
26	B00082H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
27	B00083H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
28	B00084H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
29	B00085H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
30	B00086H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
31	B00087H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
32	B00088H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
33	B00089H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
34	B00091H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
35	B00092H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
36	B00093H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
37	B00094H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
38	B00095H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
39	B00096H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
40	B00097H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
41	B00098H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
42	B00099H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
43	B00100H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
44	B00126H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
45	B00127H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
46	B00128H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
47	B00129H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
48	B00130H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
49	B00131H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
50	B00132H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071

51	B00133H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
52	B00135H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
53	B00136H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
54	B00138H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
55	B00139H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
56	B00140H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
57	B00141H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
58	B00142H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
59	B00143H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
60	B00144H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
61	B00145H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
62	B00146H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
63	B00147H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
64	B00148H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
65	B00149H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
66	B00150H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
67	B00176H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
68	B00177H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
69	B00178H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
70	B00179H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
71	B00180H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
72	B00181H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
73	B00183H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
74	B00184H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
75	B00185H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
76	B00186H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
77	B00187H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
78	B00188H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
79	B00189H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
80	B00190H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
81	B00191H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
82	B00192H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
83	B00193H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
84	B00194H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
85	B00196H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
86	B00197H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
87	B00198H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
88	B00199H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
89	B00200H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
90	B00226H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
91	B00227H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
92	B00228H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
93	B00229H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
94	B00230H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
95	B00231H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
96	B00232H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
97	B00233H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
98	B00234H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
99	B00235H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
100	B00236H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
101	B00237H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
102	B00238H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
103	B00239H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
104	B00240H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
105	B00241H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070

106	B00242H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
107	B00243H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
108	B00244H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
109	B00245H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
110	B00246H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
111	B00247H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
112	B00248H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
113	B00249H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
114	B00250H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
115	B00276H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
116	B00277H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
117	B00278H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
118	B00279H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
119	B00280H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
120	B00281H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
121	B00282H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
122	B00283H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
123	B00284H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
124	B00285H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
125	B00286H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
126	B00287H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
127	B00288H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
128	B00289H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
129	B00290H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
130	B00292H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
131	B00293H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
132	B00294H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
133	B00295H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
134	B00296H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
135	B00297H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
136	B00298H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
137	B00299H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
138	B00300H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030

END FORM
138 STRAINS

Strains isolated from water at 4C capable of growth at 20C.

1	B00003L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
2	B00005L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
3	B00006L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
4	B00013L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
5	B00015L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
6	B00023L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
7	B00052L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
8	B00053L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
9	B00054L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
10	B00055L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
11	B00057L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
12	B00058L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
13	B00059L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
14	B00060L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
15	B00061L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
16	B00062L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
17	B00063L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
18	B00066L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
19	B00067L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
20	B00068L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
21	B00070L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
22	B00071L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
23	B00072L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
24	B00073L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
25	B00074L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
26	B00075L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
27	B00101L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
28	B00102L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
29	B00103L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
30	B00104L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
31	B00105L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
32	B00106L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
33	B00107L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
34	B00108L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
35	B00109L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
36	B00110L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
37	B00111L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
38	B00112L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
39	B00113L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
40	B00114L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
41	B00115L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
42	B00116L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
43	B00117L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
44	B00118L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
45	B00119L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
46	B00120L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
47	B00121L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
48	B00122L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
49	B00123L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
50	B00124L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071

51	B00125L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
52	B00151L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
53	B00152L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
54	B00153L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
55	B00154L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
56	B00155L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
57	B00156L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
58	B00157L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
59	B00159L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
60	B00160L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
61	B00162L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
62	B00163L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
63	B00164L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
64	B00165L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
65	B00166L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
66	B00167L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
67	B00168L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
68	B00169L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
69	B00170L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
70	B00171L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
71	B00172L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
72	B00173L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
73	B00174L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
74	B00175L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
75	B00201L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
76	B00202L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
77	B00203L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
78	B00204L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
79	B00205L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
80	B00206L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
81	B00207L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
82	B00208L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
83	B00209L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
84	B00210L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
85	B00211L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
86	B00212L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
87	B00213L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
88	B00214L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
89	B00215L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
90	B00216L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
91	B00217L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
92	B00218L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
93	B00219L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
94	B00220L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
95	B00222L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
96	B00223L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
97	B00225L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
98	B00278L	BEAUFORT	SAMPLE	11	WATER	04C	STATION030
99	B00280L	BEAUFORT	SAMPLE	11	WATER	04C	STATION030
100	B00281L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
101	B00283L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
102	B00291L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002
103	B00294L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002
104	B00295L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002

END FORM 100192
104 STRAINS

Strains isolated from sediment at 4C capable of growth at 20C.

1	B00026L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
2	B00031L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
3	B00038L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
4	B00050L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
5	B00078L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
6	B00081L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
7	B00084L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
8	B00085L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
9	B00088L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
10	B00093L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
11	B00096L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
12	B00127L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
13	B00130L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
14	B00138L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
15	B00139L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
16	B00140L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
17	B00143L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
18	B00146L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
19	B00150L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
20	B00177L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
21	B00178L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
22	B00179L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
23	B00180L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
24	B00182L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
25	B00183L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
26	B00186L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
27	B00187L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
28	B00188L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
29	B00189L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
30	B00190L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
31	B00191L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
32	B00192L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
33	B00194L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
34	B00196L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
35	B00197L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
36	B00198L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
37	B00199L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
38	B00200L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
39	B00226L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
40	B00227L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
41	B00228L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
42	B00229L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
43	B00230L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
44	B00232L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
45	B00233L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
46	B00234L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
47	B00235L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
48	B00236L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
49	B00237L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
50	B00238L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070

51	B00240L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
52	B00241L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
53	B00243L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
54	B00244L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
55	B00245L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
56	B00246L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
57	B00247L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
58	B00249L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
59	B00250L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
60	B00251L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
61	B00252L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
62	B00253L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
63	B00254L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
64	B00256L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
65	B00257L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
66	B00258L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
67	B00259L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
68	B00261L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
69	B00263L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
70	B00264L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
71	B00266L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
72	B00267L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
73	B00269L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
74	B00272L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
75	B00273L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
76	B00274L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
77	B00275L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
78	B00286L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
79	B00287L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
80	B00288L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
81	B00289L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
82	B00290L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
83	B00296L	BEAUFORT	SAMPLE	32	SEDIMENT	04C	STATION002
84	B00297L	BEAUFORT	SAMPLE	32	SEDIMENT	04C	STATION002
85	B00299L	BEAUFORT	SAMPLE	32	SEDIMENT	04C	STATION002

END FORM
85 STRAINS

Strains isolated from water at 4C capable of growth at 37C.

1 B00117L BEAUFORT SAMPLE 27 WATER 04C STATION071

END FORM 100192

1 STRAINS

Strains isolated from water at 20C capable of growth at 37C.

1	B00014H	BEAUFORT SAMPLE 03 WATER 20C STATION010
2	B00017H	BEAUFORT SAMPLE 03 WATER 20C STATION010
3	B00024H	BEAUFORT SAMPLE 03 WATER 20C STATION010
4	B00067H	BEAUFORT SAMPLE 20 WATER 20C STATION002
5	B00112H	BEAUFORT SAMPLE 27 WATER 20C STATION071
6	B00122H	BEAUFORT SAMPLE 27 WATER 20C STATION071
7	B00123H	BEAUFORT SAMPLE 27 WATER 20C STATION071
8	B00203H	BEAUFORT SAMPLE 26 WATER 20C STATION070
9	B00216H	BEAUFORT SAMPLE 26 WATER 20C STATION070
10	B00222H	BEAUFORT SAMPLE 26 WATER 20C STATION070

END FORM
10 STRAINS

Strains isolated from sediment at 20C capable of growth at 37C.

1	B00027H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
2	B00036H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
3	B00098H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
4	B00229H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
5	B00230H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
6	B00293H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030

END FORM
6 STRAINS

Strains isolated from water at 4C capable of growth in the presence of 3% NaCl.

1	B00003L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
2	B00005L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
3	B00006L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
4	B00009L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
5	B00012L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
6	B00013L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
7	B00014L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
8	B00021L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
9	B00022L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
10	B00024L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
11	B00025L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
12	B00053L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
13	B00054L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
14	B00057L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
15	B00058L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
16	B00060L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
17	B00062L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
18	B00063L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
19	B00066L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
20	B00067L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
21	B00068L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
22	B00069L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
23	B00071L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
24	B00072L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
25	B00073L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
26	B00074L	BEAUFORT	SAMPLE	20	WATER	[illegible]	STATION002
27	B00075L	BEAUFORT	SAMPLE	20	WATER	[illegible]	STATION002
28	B00103L	BEAUFORT	SAMPLE	27	WATER	[illegible]	STATION071
29	B00104L	BEAUFORT	SAMPLE	27	WATER	[illegible]	STATION071
30	B00106L	BEAUFORT	SAMPLE	27	WATER	[illegible]	STATION071
31	B00108L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
32	B00109L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
33	B00111L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
34	B00112L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
35	B00113L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
36	B00114L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
37	B00115L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
38	B00116L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
39	B00117L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
40	B00119L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
41	B00120L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
42	B00121L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
43	B00122L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
44	B00123L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
45	B00124L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
46	B00125L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
47	B00151L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
48	B00152L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
49	B00153L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
50	B00154L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055

51	B00155L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
52	B00156L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
53	B00157L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
54	B00159L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
55	B00160L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
56	B00163L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
57	B00164L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
58	B00165L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
59	B00166L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
60	B00167L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
61	B00169L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
62	B00170L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
63	B00171L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
64	B00173L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
65	B00174L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
66	B00175L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
67	B00201L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
68	B00202L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
69	B00203L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
70	B00205L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
71	B00206L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
72	B00207L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
73	B00208L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
74	B00210L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
75	B00212L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
76	B00213L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
77	B00214L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
78	B00215L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
79	B00216L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
80	B00217L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
81	B00218L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
82	B00219L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
83	B00220L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
84	B00221L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
85	B00222L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
86	B00223L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
87	B00224L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
88	B00225L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
89	B00278L	BEAUFORT	SAMPLE	11	WATER	04C	STATION030
90	B00280L	BEAUFORT	SAMPLE	11	WATER	04C	STATION030
91	B00281L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
92	B00282L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
93	B00283L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
94	B00284L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
95	B00291L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002
96	B00292L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002
97	B00294L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002
98	B00295L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002

END FORM
98 STRAINS

Strains isolated from sediment at 4C capable of growth in presence of 3% NaCl.

1	B00026L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
2	B00027L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
3	B00028L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
4	B00029L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
5	B00030L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
6	B00031L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
7	B00032L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
8	B00033L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
9	B00034L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
10	B00035L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
11	B00036L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
12	B00037L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
13	B00039L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
14	B00040L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
15	B00041L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
16	B00042L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
17	B00043L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
18	B00044L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
19	B00046L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
20	B00047L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
21	B00048L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
22	B00049L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
23	B00050L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
24	B00076L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
25	B00077L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
26	B00078L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
27	B00079L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
28	B00080L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
29	B00082L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
30	B00083L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
31	B00084L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
32	B00085L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
33	B00086L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
34	B00087L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
35	B00088L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
36	B00089L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
37	B00091L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
38	B00092L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
39	B00093L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
40	B00094L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
41	B00095L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
42	B00096L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
43	B00097L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
44	B00098L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
45	B00099L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
46	B00100L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
47	B00126L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
48	B00127L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
49	B00128L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
50	B00129L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071

51	B00130L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
52	B00131L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
53	B00132L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
54	B00133L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
55	B00134L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
56	B00135L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
57	B00136L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
58	B00137L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
59	B00141L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
60	B00143L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
61	B00144L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
62	B00145L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
63	B00146L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
64	B00147L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
65	B00148L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
66	B00149L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
67	B00150L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
68	B00176L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
69	B00178L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
70	B00179L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
71	B00180L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
72	B00181L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
73	B00182L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
74	B00183L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
75	B00184L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
76	B00185L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
77	B00186L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
78	B00188L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
79	B00190L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
80	B00191L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
81	B00192L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
82	B00194L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
83	B00195L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
84	B00196L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
85	B00198L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
86	B00199L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
87	B00200L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
88	B00226L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
89	B00227L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
90	B00228L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
91	B00229L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
92	B00230L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
93	B00232L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
94	B00233L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
95	B00234L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
96	B00235L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
97	B00236L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
98	B00237L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
99	B00238L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
100	B00240L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070

101	B00241L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
102	B00242L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
103	B00243L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
104	B00244L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
105	B00245L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
106	B00246L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
107	B00247L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
108	B00248L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
109	B00249L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
110	B00250L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
111	B00251L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
112	B00252L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
113	B00253L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
114	B00254L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
115	B00256L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
116	B00257L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
117	B00258L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
118	B00259L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
119	B00261L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
120	B00262L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
121	B00263L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
122	B00264L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
123	B00265L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
124	B00266L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
125	B00267L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
126	B00268L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
127	B00269L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
128	B00271L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
129	B00272L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
130	B00273L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
131	B00274L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
132	B00275L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
133	B00286L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
134	B00287L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
135	B00288L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
136	B00289L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
137	B00290L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
138	B00296L	BEAUFORT	SAMPLE	32	SEDIMENT	04C	STATION002
139	B00297L	BEAUFORT	SAMPLE	32	SEDIMENT	04C	STATION002
140	B00298L	BEAUFORT	SAMPLE	32	SEDIMENT	04C	STATION002
141	B00299L	BEAUFORT	SAMPLE	32	SEDIMENT	04C	STATION002
142	B00300L	BEAUFORT	SAMPLE	32	SEDIMENT	04C	STATION002

END FORM
142 STRAINS

Strains isolated from water at 20C capable of growth in the presence of 3% NaCl.

1	B00001H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
2	B00002H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
3	B00003H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
4	B00004H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
5	B00005H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
6	B00006H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
7	B00007H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
8	B00008H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
9	B00009H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
10	B00010H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
11	B00011H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
12	B00012H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
13	B00013H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
14	B00014H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
15	B00015H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
16	B00016H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
17	B00017H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
18	B00018H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
19	B00019H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
20	B00020H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
21	B00021H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
22	B00022H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
23	B00023H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
24	B00024H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
25	B00051H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
26	B00052H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
27	B00053H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
28	B00054H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
29	B00055H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
30	B00056H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
31	B00057H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
32	B00058H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
33	B00059H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
34	B00060H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
35	B00061H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
36	B00062H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
37	B00063H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
38	B00064H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
39	B00065H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
40	B00066H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
41	B00067H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
42	B00068H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
43	B00069H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
44	B00070H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
45	B00071H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
46	B00072H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
47	B00073H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
48	B00075H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
49	B00101H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
50	B00102H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071

51	B00103H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
52	B00104H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
53	B00106H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
54	B00109H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
55	B00111H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
56	B00112H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
57	B00113H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
58	B00115H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
59	B00116H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
60	B00117H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
61	B00118H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
62	B00119H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
63	B00120H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
64	B00121H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
65	B00122H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
66	B00123H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
67	B00151H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
68	B00152H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
69	B00153H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
70	B00154H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
71	B00155H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
72	B00156H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
73	B00157H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
74	B00158H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
75	B00159H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
76	B00160H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
77	B00161H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
78	B00162H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
79	B00163H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
80	B00164H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
81	B00165H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
82	B00166H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
83	B00168H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
84	B00169H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
85	B00170H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
86	B00201H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
87	B00202H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
88	B00203H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
89	B00204H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
90	B00205H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
91	B00206H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
92	B00207H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
93	B00208H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
94	B00210H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
95	B00211H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
96	B00212H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
97	B00213H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
98	B00216H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
99	B00217H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
100	B00219H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
101	B00221H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
102	B00222H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
103	B00223H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
104	B00251H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
105	B00252H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030

106	B00253H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
107	B00254H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
108	B00255H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
109	B00256H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
110	B00257H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
111	B00258H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
112	B00259H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
113	B00260H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
114	B00261H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
115	B00262H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
116	B00263H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
117	B00264H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
118	B00265H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
119	B00266H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
120	B00268H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
121	B00269H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
122	B00270H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
123	B00271H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
124	B00272H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
125	B00273H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
126	B00275H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030

END FORM
126 STRAINS

Strains isolated from sediment at 20C capable of growth in the presence of 3% NaCl.

1	B00026H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
2	B00027H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
3	B00028H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
4	B00029H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
5	B00030H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
6	B00031H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
7	B00032H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
8	B00033H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
9	B00035H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
10	B00036H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
11	B00037H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
12	B00038H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
13	B00039H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
14	B00040H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
15	B00041H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
16	B00042H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
17	B00043H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
18	B00044H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
19	B00045H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
20	B00047H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
21	B00048H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
22	B00076H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
23	B00077H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
24	B00078H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
25	B00079H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
26	B00081H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
27	B00082H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
28	B00083H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
29	B00084H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
30	B00085H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
31	B00086H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
32	B00087H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
33	B00088H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
34	B00089H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
35	B00091H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
36	B00092H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
37	B00093H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
38	B00094H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
39	B00095H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
40	B00096H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
41	B00098H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
42	B00099H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
43	B00126H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
44	B00127H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
45	B00128H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
46	B00129H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
47	B00130H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071

48	B00131H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
49	B00132H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
50	B00135H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
51	B00136H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
52	B00138H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
53	B00139H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
54	B00140H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
55	B00141H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
56	B00142H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
57	B00143H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
58	B00144H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
59	B00145H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
60	B00146H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
61	B00147H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
62	B00148H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
63	B00149H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
64	B00150H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
65	B00176H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
66	B00177H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
67	B00178H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
68	B00179H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
69	B00180H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
70	B00181H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
71	B00183H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
72	B00184H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
73	B00185H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
74	B00186H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
75	B00187H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
76	B00188H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
77	B00189H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
78	B00190H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
79	B00191H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
80	B00192H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
81	B00193H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
82	B00194H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
83	B00195H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
84	B00196H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
85	B00197H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
86	B00198H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
87	B00199H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
88	B00200H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
89	B00226H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
90	B00227H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
91	B00228H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
92	B00229H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
93	B00230H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
94	B00231H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
95	B00232H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
96	B00233H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
97	B00234H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
98	B00235H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
99	B00236H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
100	B00237H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070

101	B00238H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
102	B00239H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
103	B00240H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
104	B00241H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
105	B00242H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
106	B00243H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
107	B00244H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
108	B00245H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
109	B00246H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
110	B00247H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
111	B00248H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
112	B00249H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
113	B00250H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
114	B00276H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
115	B00277H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
116	B00278H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
117	B00279H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
118	B00280H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
119	B00281H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
120	B00282H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
121	B00283H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
122	B00284H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
123	B00285H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
124	B00286H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
125	B00287H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
126	B00288H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
127	B00289H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
128	B00290H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
129	B00292H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
130	B00293H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
131	B00294H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
132	B00295H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
133	B00296H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
134	B00297H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
135	B00298H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
136	B00299H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
137	B00300H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030

END FORM

137 STRAINS

Strains isolated from water at 4C capable of growth in the presence of 5% NaCl.

1	B00003L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
2	B00005L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
3	B00006L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
4	B00009L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
5	B00012L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
6	B00014L	BEAUFORT	SAMPLE	03	WATER	04[illegible]	STATION010
7	B00021L	BEAUFORT	SAMPLF	03	WATE[illegible]		STATION010
8	B00022L	BEAUFORT	SAMPL[illegible]	03	WATE[illegible]		STATION010
9	B00024L	BEAUFORT	SAMPLE	03	WATER	04[illegible]	STATION010
10	B00025L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
11	B00053L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
12	B00054L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
13	B00057L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
14	B00058L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
15	B00060L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
16	B00062L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
17	B00063L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
18	B00066L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
19	B00067L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
20	B00068L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
21	B00069L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
22	B00074L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
23	B00075L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
24	B00103L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
25	B00104L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
26	B00106L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
27	B00108L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
28	B00109L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
29	B00111L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
30	B00112L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
31	B00113L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
32	B00115L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
33	B00116L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
34	B00117L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
35	B00119L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
36	B00120L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
37	B00121L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
38	B00122L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
39	B00124L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
40	B00125L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
41	B00151L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
42	B00152L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
43	B00153L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
44	B00154L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
45	B00155L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
46	B00156L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
47	B00157L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
48	B00160L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
49	B00163L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
50	B00164L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055

51	B00165L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
52	B00167L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
53	B00169L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
54	B00170L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
55	B00171L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
56	B00173L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
57	B00175L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
58	B00201L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
59	B00202L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
60	B00203L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
61	B00205L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
62	B00206L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
63	B00207L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
64	B00208L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
65	B00210L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
66	B00212L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
67	B00213L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
68	B00216L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
69	B00217L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
70	B00218L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
71	B00220L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
72	B00221L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
73	B00222L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
74	B00223L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
75	B00224L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
76	B00225L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
77	B00281L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
78	B00282L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
79	B00283L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
80	B00284L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
81	B00291L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002
82	B00292L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002
83	B00294L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002
84	B00295L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002

END FORM
84 STRAINS

Strains isolated form sediment at 4C capable of growth in presence of 5% NaCl.

1	B00026L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
2	B00027L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
3	B00028L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
4	B00031L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
5	B00032L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
6	B00033L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
7	B00035L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
8	B00036L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
9	B00037L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
10	B00039L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
11	B00040L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
12	B00041L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
13	B00042L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
14	B00043L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
15	B00044L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
16	B00046L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
17	B00047L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
18	B00048L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
19	B00049L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
20	B00050L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
21	B00076L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
22	B00077L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
23	B00078L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
24	B00079L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
25	B00080L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
26	B00082L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
27	B00083L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
28	B00086L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
29	B00087L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
30	B00088L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
31	B00092L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
32	B00095L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
33	B00096L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
34	B00100L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
35	B00126L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
36	B00127L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
37	B00128L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
38	B00129L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
39	B00130L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
40	B00131L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
41	B00132L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
42	B00134L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
43	B00135L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
44	B00137L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
45	B00143L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
46	B00144L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
47	B00145L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
48	B00149L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
49	B00150L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
50	B00176L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055

51	B00178L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
52	B00179L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
53	B00180L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
54	B00181L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
55	B00182L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
56	B00183L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
57	B00184L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
58	B00185L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
59	B00186L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
60	B00188L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
61	B00190L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
62	B00191L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
63	B00192L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
64	B00195L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
65	B00196L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
66	B00198L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
67	B00199L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
68	B00200L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
69	B00227L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
70	B00228L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
71	B00230L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
72	B00232L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
73	B00233L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
74	B00234L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
75	B00236L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
76	B00237L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
77	B00238L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
78	B00241L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
79	B00242L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
80	B00243L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
81	B00244L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
82	B00245L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
83	B00246L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
84	B00247L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
85	B00248L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
86	B00249L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
87	B00251L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
88	B00252L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
89	B00254L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
90	B00256L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
91	B00258L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
92	B00262L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
93	B00263L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
94	B00264L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
95	B00265L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
96	B00266L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
97	B00267L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
98	B00268L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
99	B00269L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
100	B00271L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
101	B00273L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
102	B00287L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
103	B00290L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
104	B00298L	BEAUFORT	SAMPLE	32	SEDIMENT	04C	STATION002
105	B00299L	BEAUFORT	SAMPLE	32	SEDIMENT	04C	STATION002
106	B00300L	BEAUFORT	SAMPLE	32	SEDIMENT	04C	STATION002

END FORM
106 STRAINS

Strains isolated from water at 20C capable of growth in the presence of 5% NaCl.

1	B00001H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
2	B00002H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
3	B00003H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
4	B00004H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
5	B00005H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
6	B00006H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
7	B00007H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
8	B00008H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
9	B00009H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
10	B00010H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
11	B00012H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
12	B00013H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
13	B00014H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
14	B00016H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
15	B00017H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
16	B00018H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
17	B00020H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
18	B00021H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
19	B00022H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
20	B00023H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
21	B00024H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
22	B00051H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
23	B00052H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
24	B00053H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
25	B00054H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
26	B00055H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
27	B00057H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
28	B00058H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
29	B00059H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
30	B00060H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
31	B00061H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
32	B00062H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
33	B00063H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
34	B00064H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
35	B00065H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
36	B00066H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
37	B00067H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
38	B00068H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
39	B00069H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
40	B00070H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
41	B00071H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
42	B00072H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
43	B00073H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
44	B00075H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
45	B00101H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
46	B00102H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
47	B00103H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
48	B00104H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
49	B00106H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
50	B00109H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071

51	B00110H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
52	B00112H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
53	B00113H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
54	B00114H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
55	B00115H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
56	B00116H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
57	B00117H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
58	B00118H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
59	B00119H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
60	B00120H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
61	B00121H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
62	B00122H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
63	B00123H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
64	B00151H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
65	B00152H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
66	B00153H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
67	B00154H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
68	B00155H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
69	B00156H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
70	B00158H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
71	B00159H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
72	B00160H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
73	B00161H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
74	B00162H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
75	B00163H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
76	B00164H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
77	B00165H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
78	B00166H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
79	B00168H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
80	B00169H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
81	B00170H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
82	B00202H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
83	B00203H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
84	B00204H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
85	B00205H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
86	B00206H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
87	B00207H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
88	B00210H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
89	B00211H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
90	B00212H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
91	B00213H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
92	B00216H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
93	B00217H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
94	B00219H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
95	B00221H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
96	B00222H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
97	B00223H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
98	B00251H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
99	B00252H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
100	B00253H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030

101	B00254H	BEAUFORT SAMPLE 11 WATER 20C STATION030
102	B00255H	BEAUFORT SAMPLE 11 WATER 20C STATION030
103	B00256H	BEAUFORT SAMPLE 11 WATER 20C STATION030
104	B00257H	BEAUFORT SAMPLE 11 WATER 20C STATION030
105	B00258H	BEAUFORT SAMPLE 11 WATER 20C STATION030
106	B00259H	BEAUFORT SAMPLE 11 WATER 20C STATION030
107	B00260H	BEAUFORT SAMPLE 11 WATER 20C STATION030
108	B00261H	BEAUFORT SAMPLE 11 WATER 20C STATION030
109	B00262H	BEAUFORT SAMPLE 11 WATER 20C STATION030
110	B00263H	BEAUFORT SAMPLE 11 WATER 20C STATION030
111	B00264H	BEAUFORT SAMPLE 11 WATER 20C STATION030
112	B00265H	BEAUFORT SAMPLE 11 WATER 20C STATION030
113	B00266H	BEAUFORT SAMPLE 11 WATER 20C STATION030
114	B00268H	BEAUFORT SAMPLE 11 WATER 20C STATION030
115	B00269H	BEAUFORT SAMPLE 11 WATER 20C STATION030
116	B00270H	BEAUFORT SAMPLE 11 WATER 20C STATION030
117	B00271H	BEAUFORT SAMPLE 11 WATER 20C STATION030
118	B00272H	BEAUFORT SAMPLE 11 WATER 20C STATION030
119	B00273H	BEAUFORT SAMPLE 11 WATER 20C STATION030
120	B00275H	BEAUFORT SAMPLE 11 WATER 20C STATION030

STOP?(Y/N):N

END FORM
120 STRAINS

Strains isolated from sediment at 20C capable of growth in the presence of 5% NaCl.

1	B00026H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
2	B00027H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
3	B00028H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
4	B00029H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
5	B00030H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
6	B00031H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
7	B00032H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
8	B00033H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
9	B00035H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
10	B00036H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
11	B00037H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
12	B00038H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
13	B00039H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
14	B00040H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
15	B00041H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
16	B00042H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
17	B00043H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
18	B00044H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
19	B00045H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
20	B00047H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
21	B00048H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
22	B00085H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
23	B00086H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
24	B00087H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
25	B00089H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
26	B00093H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
27	B00094H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
28	B00095H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
29	B00098H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
30	B00126H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
31	B00128H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
32	B00131H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
33	B00136H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
34	B00138H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
35	B00139H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
36	B00140H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
37	B00142H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
38	B00143H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
39	B00144H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
40	B00145H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
41	B00146H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
42	B00147H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
43	B00148H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
44	B00177H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
45	B00178H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
46	B00179H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
47	B00180H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
48	B00181H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
49	B00183H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
50	B00184H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055

51	B00186H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
52	B00187H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
53	B00188H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
54	B00189H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
55	B00190H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
56	B00193H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
57	B00194H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
58	B00196H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
59	B00197H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
60	B00198H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
61	B00199H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
62	B00200H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
63	B00227H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
64	B00230H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
65	B00234H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
66	B00235H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
67	B00238H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
68	B00239H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
69	B00240H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
70	B00241H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
71	B00243H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
72	B00244H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
73	B00248H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
74	B00250H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
75	B00277H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
76	B00278H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
77	B00279H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
78	B00280H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
79	B00282H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
80	B00283H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
81	B00284H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
82	B00287H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
83	B00288H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
84	B00289H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
85	B00290H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
86	B00292H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
87	B00293H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
88	B00296H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
89	B00297H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
90	B00298H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
91	B00299H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030

END FORM
91 STRAINS

Strains isolated from water at 4C capable of growth in presence of 7.5% NaCl.

1	B00005L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
2	B00006L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
3	B00021L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
4	B00024L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
5	B00057L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
6	B00058L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
7	B00060L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
8	B00062L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
9	B00063L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
10	B00066L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
11	B00068L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
12	B00109L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
13	B00111L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
14	B00117L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
15	B00157L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
16	B00163L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
17	B00164L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
18	B00165L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
19	B00173L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
20	B00175L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
21	B00202L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
22	B00203L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
23	B00205L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
24	B00206L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
25	B00207L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
26	B00208L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
27	B00210L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
28	B00212L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
29	B00213L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
30	B00217L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
31	B00218L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
32	B00282L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001

END FORM
32 STRAINS

Strains isolated from sediment at 4C capable of growth in presence of 7.5% NaCl.

1	B00088L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
2	B00095L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
3	B00126L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
4	B00127L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
5	B00133L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
6	B00134L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
7	B00143L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
8	B00178L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
9	B00179L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
10	B00180L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
11	B00181L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
12	B00182L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
13	B00183L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
14	B00184L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
15	B00185L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
16	B00186L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
17	B00190L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
18	B00192L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
19	B00196L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
20	B00198L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
21	B00200L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
22	B00227L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
23	B00236L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
24	B00237L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
25	B00246L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
26	B00249L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
27	B00251L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
28	B00264L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
29	B00269L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
30	B00287L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
31	B00299L	BEAUFORT	SAMPLE	32	SEDIMENT	04C	STATION002

END FORM
31 STRAINS

Strains isolated from water at 20C capable of growth in presence of 7.5% NaCl.

1	B00001H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
2	B00002H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
3	B00003H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
4	B00005H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
5	B00007H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
6	B00008H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
7	B00009H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
8	B00017H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
9	B00018H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
10	B00020H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
11	B00021H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
12	B00022H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
13	B00024H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
14	B00052H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
15	B00054H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
16	B00055H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
17	B00059H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
18	B00061H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
19	B00064H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
20	B00066H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
21	B00070H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
22	B00071H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
23	B00072H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
24	B00073H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
25	B00106H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
26	B00112H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
27	B00113H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
28	B00118H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
29	B00119H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
30	B00122H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
31	B00123H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
32	B00151H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
33	B00152H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
34	B00154H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
35	B00155H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
36	B00156H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
37	B00158H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
38	B00159H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
39	B00160H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
40	B00162H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055

41	B00163H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
42	B00164H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
43	B00166H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
44	B00168H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
45	B00169H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
46	B00170H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
47	B00202H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
48	B00203H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
49	B00204H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
50	B00205H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
51	B00206H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
52	B00207H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
53	B00208H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
54	B00210H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
55	B00211H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
56	B00212H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
57	B00213H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
58	B00216H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
59	B00217H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
60	B00219H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
61	B00221H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
62	B00222H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
63	B00251H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
64	B00252H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
65	B00254H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
66	B00255H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
67	B00256H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
68	B00258H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
69	B00259H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
70	B00260H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
71	B00262H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
72	B00263H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
73	B00264H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
74	B00265H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
75	B00266H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
76	B00268H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
77	B00269H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
78	B00270H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
79	B00272H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
80	B00273H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
81	B00275H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030

END FORM
81 STRAINS

Strains isolated from sediment at 20C capable of growth in presence of 7.5% NaCl.

1	B00026H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
2	B00027H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
3	B00028H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
4	B00029H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
5	B 0033H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
6	B00035H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
7	B00036H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
8	B00037H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
9	B00038H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
10	B00039H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
11	B00042H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
12	B00043H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
13	B00044H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
14	B00045H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
15	B00048H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
16	B00098H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
17	B00131H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
18	B00136H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
19	B00140H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
20	B00143H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
21	B00145H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
22	B00148H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
23	B00178H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
24	B00180H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
25	B00183H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
26	B00187H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
27	B00188H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
28	B00190H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
29	B00193H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
30	B00196H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
31	B00200H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
32	B00229H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
33	B00230H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
34	B00239H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
35	B00240H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
36	B00241H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
37	B00243H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
38	B00248H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
39	B00250H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
40	B00279H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
41	B00280H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
42	B00283H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
43	B00284H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
44	B00287H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
45	B00289H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
46	B00293H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
47	B00296H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
48	B00297H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030

END FORM
48 STRAINS

Strains isolated from water at 4C capable of growth at pH 4 or pH 5.

1	B00005L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
2	B00006L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
3	B00013L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
4	B00014L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
5	B00015L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
6	B00021L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
7	B00024L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
8	B00054L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
9	B00060L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
10	B00068L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
11	B00069L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
12	B00072L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
13	B00103L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
14	B00104L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
15	B00106L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
16	B00108L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
17	B00111L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
18	B00113L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
19	B00115L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
20	B00117L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
21	B00119L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
22	B00120L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
23	B00121L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
24	B00122L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
25	B00124L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
26	B00125L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
27	B00154L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
28	B00155L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
29	B00157L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
30	B00160L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
31	B00163L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
32	B00165L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
33	B00166L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
34	B00167L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
35	B00169L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
36	B00170L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
37	B00171L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
38	B00173L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
39	B00175L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
40	B00203L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
41	B00205L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
42	B00206L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
43	B00207L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
44	B00208L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
45	B00210L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
46	B00213L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
47	B00217L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
48	B00218L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
49	B00220L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
50	B00281L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
51	B00282L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
52	B00284L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
53	B00291L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002

END FORM
53 STRAINS

Strains isolated from sediment at 4C. capable of growth at pH 4 or pH 5.

1	B00026L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
2	B00027L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
3	B00028L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
4	B00029L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
5	B00030L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
6	B00032L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
7	B00033L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
8	B00035L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
9	B00036L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
10	B00037L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
11	B00039L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
12	B00040L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
13	B00041L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
14	B00042L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
15	B00044L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
16	B00047L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
17	B00048L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
18	B00049L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
19	B00050L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
20	B00076L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
21	B00077L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
22	B00079L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
23	B00080L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
24	B00082L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
25	B00087L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
26	B00089L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
27	B00091L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
28	B00092L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
29	B00094L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
30	B00095L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
31	B00096L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
32	B00097L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
33	B00098L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
34	B00099L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
35	B00100L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
36	B00126L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
37	B00128L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
38	B00129L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
39	B00130L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
40	B00131L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
41	B00132L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
42	B00133L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
43	B00134L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
44	B00135L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
45	B00136L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
46	B00137L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
47	B00141L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
48	B00143L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
49	B00144L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
50	B00145L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071

51	B00147L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
52	B00148L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
53	B00149L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
54	B00150L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
55	B00178L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
56	B00179L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
57	B00180L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
58	B00181L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
59	B00182L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
60	B00183L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
61	B00184L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
62	B00185L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
63	B00186L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
64	B00187L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
65	B00188L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
66	B00189L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
67	B00191L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
68	B00192L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
69	B00195L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
70	B00198L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
71	B00200L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
72	B00227L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
73	B00228L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
74	B00229L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
75	B00230L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
76	B00232L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
77	B00234L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
78	B00235L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
79	B00236L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
80	B00237L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
81	B00238L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
82	B00240L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
83	B00241L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
84	B00242L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
85	B00244L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
86	B00245L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
87	B00246L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
88	B00247L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
89	B00248L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
90	B00249L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
91	B00251L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
92	B00252L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
93	B00253L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
94	B00254L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
95	B00256L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
96	B00257L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
97	B00259L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
98	B00261L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
99	B00262L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
100	B00263L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030

101	B00264L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
102	B00265L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
103	B00266L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
104	B00267L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
105	B00268L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
106	B00269L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
107	B00272L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
108	B00273L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
109	B00274L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
110	B00287L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
111	B00288L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
112	B00289L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
113	B00290L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
114	B00297L	BEAUFORT	SAMPLE	32	SEDIMENT	04C	STATION002
115	B00299L	BEAUFORT	SAMPLE	32	SEDIMENT	04C	STATION002

END FORM 190192
115 STRAINS
ENTER COMMAND

Strains isolated from water at 20C capable of growth at pH 4 or pH 5.

1	B00001H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
2	B00002H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
3	B00003H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
4	B00004H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
5	B00005H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
6	B00006H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
7	B00007H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
8	B00008H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
9	B00009H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
10	B00010H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
11	B00011H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
12	B00012H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
13	B00013H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
14	B00014H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
15	B00015H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
16	B00016H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
17	B00017H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
18	B00018H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
19	B00019H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
20	B00020H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
21	B00021H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
22	B00022H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
23	B00023H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
24	B00024H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
25	B00052H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
26	B00054H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
27	B00055H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
28	B00056H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
29	B00057H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
30	B00062H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
31	B00063H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
32	B00070H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
33	B00071H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
34	B00075H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
35	B00101H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
36	B00102H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
37	B00103H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
38	B00106H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
39	B00109H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
40	B00110H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
41	B00111H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
42	B00112H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
43	B00113H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
44	B00114H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
45	B00115H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
46	B00116H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
47	B00117H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
48	B00118H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
49	B00119H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
50	B00122H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071

51	B00123H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
52	B00154H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
53	B00155H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
54	B00157H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
55	B00161H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
56	B00169H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
57	B00170H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
58	B00201H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
59	B00203H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
60	B00207H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
61	B00216H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
62	B00222H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
63	B00252H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
64	B00253H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
65	B00257H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
66	B00265H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
67	B00266H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
68	B00272H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030

END FORM
68 STRAINS

Strains isolated from sediment at 20C capable of growth at pH 4 or pH 5.

1	B00026H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
2	B00027H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
3	B00028H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
4	B00029H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
5	B00030H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
6	B00031H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
7	B00032H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
8	B00033H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
9	B00035H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
10	B00036H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
11	B00037H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
12	B00038H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
13	B00039H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
14	B00042H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
15	B00043H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
16	B00044H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
17	B00045H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
18	B00047H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
19	B00048H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
20	B00077H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
21	B00078H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
22	B00085H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
23	B00089H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
24	B00092H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
25	B00093H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
26	B00095H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
27	B00098H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
28	B00099H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
29	B00126H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
30	B00127H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
31	B00128H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
32	B00129H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
33	B00130H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
34	B00131H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
35	B00132H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
36	B00133H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
37	B00135H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
38	B00136H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
39	B00138H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
40	B00140H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
41	B00141H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
42	B00142H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
43	B00143H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
44	B00144H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
45	B00145H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
46	B00146H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
47	B00147H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
48	B00148H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
49	B00150H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
50	B00176H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055

51	B00179H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
52	B00180H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
53	B00183H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
54	B00184H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
55	B00185H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
56	B00187H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
57	B00188H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
58	B00190H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
59	B00191H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
60	B00192H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
61	B00193H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
62	B00195H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
63	B00196H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
64	B00197H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
65	B00200H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
66	B00226H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
67	B00227H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
68	B00228H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
69	B00229H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
70	B00230H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
71	B00231H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
72	B00232H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
73	B00234H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
74	B00235H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
75	B00236H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
76	B00238H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
77	B00239H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
78	B00242H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
79	B00244H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
80	B00245H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
81	B00246H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
82	B00248H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
83	B00249H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
84	B00276H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
85	B00277H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
86	B00278H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
87	B00280H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
88	B00281H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
89	B00282H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
90	B00283H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
91	B00284H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
92	B00285H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
93	B00286H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
94	B00287H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
95	B00289H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
96	B00290H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
97	B00292H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
98	B00293H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
99	B00294H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
100	B00295H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
101	B00296H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
102	B00297H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
103	B00298H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
104	B00299H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
105	B00300H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030

END FORM

105 STRAINS

Strains isolated from water at 4C capable of growth at pH 6.

1	B00003L	BEAUFORT SAMPLE 03 WATER 04C STATION010
2	B00005L	BEAUFORT SAMPLE 03 WATER 04C STATION010
3	B00006L	BEAUFORT SAMPLE 03 WATER 04C STATION010
4	B00013L	BEAUFORT SAMPLE 03 WATER 04C STATION010
5	B00014L	BEAUFORT SAMPLE 03 WATER 04C STATION010
6	B00015L	BEAUFORT SAMPLE 03 WATER 04C STATION010
7	B00021L	BEAUFORT SAMPLE 03 WATER 04C STATION010
8	B00022L	BEAUFORT SAMPLE 03 WATER 04C STATION010
9	B00024L	BEAUFORT SAMPLE 03 WATER 04C STATION010
10	B00025L	BEAUFORT SAMPLE 03 WATER 04C STATION010
11	B00052L	BEAUFORT SAMPLE 20 WATER 04C STATION002
12	B00053L	BEAUFORT SAMPLE 20 WATER 04C STATION002
13	B00054L	BEAUFORT SAMPLE 20 WATER 04C STATION002
14	B00055L	BEAUFORT SAMPLE 20 WATER 04C STATION002
15	B00060L	BEAUFORT SAMPLE 20 WATER 04C STATION002
16	B00061L	BEAUFORT SAMPLE 20 WATER 04C STATION002
17	B00062L	BEAUFORT SAMPLE 20 WATER 04C STATION002
18	B00063L	BEAUFORT SAMPLE 20 WATER 04C STATION002
19	B00066L	BEAUFORT SAMPLE 20 WATER 04C STATION002
20	B00067L	BEAUFORT SAMPLE 20 WATER 04C STATION002
21	B00068L	BEAUFORT SAMPLE 20 WATER 04C STATION002
22	B00069L	BEAUFORT SAMPLE 20 WATER 04C STATION002
23	B00070L	BEAUFORT SAMPLE 20 WATER 04C STATION002
24	B00071L	BEAUFORT SAMPLE 20 WATER 04C STATION002
25	B00072L	BEAUFORT SAMPLE 20 WATER 04C STATION002
26	B00074L	BEAUFORT SAMPLE 20 WATER 04C STATION002
27	B00075L	BEAUFORT SAMPLE 20 WATER 04C STATION002
28	B00103L	BEAUFORT SAMPLE 27 WATER 04C STATION071
29	B00104L	BEAUFORT SAMPLE 27 WATER 04C STATION071
30	B00105L	BEAUFORT SAMPLE 27 WATER 04C STATION071
31	B00106L	BEAUFORT SAMPLE 27 WATER 04C STATION071
32	B00107L	BEAUFORT SAMPLE 27 WATER 04C STATION071
33	B00108L	BEAUFORT SAMPLE 27 WATER 04C STATION071
34	B00109L	BEAUFORT SAMPLE 27 WATER 04C STATION071
35	B00111L	BEAUFORT SAMPLE 27 WATER 04C STATION071
36	B00113L	BEAUFORT SAMPLE 27 WATER 04C STATION071
37	B00115L	BEAUFORT SAMPLE 27 WATER 04C STATION071
38	B00116L	BEAUFORT SAMPLE 27 WATER 04C STATION071
39	B00117L	BEAUFORT SAMPLE 27 WATER 04C STATION071
40	B00118L	BEAUFORT SAMPLE 27 WATER 04C STATION071
41	B00119L	BEAUFORT SAMPLE 27 WATER 04C STATION071
42	B00120L	BEAUFORT SAMPLE 27 WATER 04C STATION071
43	B00121L	BEAUFORT SAMPLE 27 WATER 04C STATION071
44	B00122L	BEAUFORT SAMPLE 27 WATER 04C STATION071
45	B00123L	BEAUFORT SAMPLE 27 WATER 04C STATION071
46	B00124L	BEAUFORT SAMPLE 27 WATER 04C STATION071
47	B00125L	BEAUFORT SAMPLE 27 WATER 04C STATION071
48	B00152L	BEAUFORT SAMPLE 24 WATER 04C STATION055
49	B00153L	BEAUFORT SAMPLE 24 WATER 04C STATION055
50	B00154L	BEAUFORT SAMPLE 24 WATER 04C STATION055

51	B00155L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
52	B00156L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
53	B00157L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
54	B00159L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
55	B00160L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
56	B00163L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
57	B00164L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
58	B00165L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
59	B00166L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
60	B00167L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
61	B00168L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
62	B00169L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
63	B00170L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
64	B00171L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
65	B00172L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
66	B00173L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
67	B00175L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
68	B00201L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
69	B00202L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
70	B00203L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
71	B00205L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
72	B00206L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
73	B00207L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
74	B00208L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
75	B00209L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
76	B00210L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
77	B00211L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
78	B00212L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
79	B00213L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
80	B00214L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
81	B00215L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
82	B00216L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
83	B00217L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
84	B00218L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
85	B00219L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
86	B00220L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
87	B00278L	BEAUFORT	SAMPLE	11	WATER	04C	STATION030
88	B00280L	BEAUFORT	SAMPLE	11	WATER	04C	STATION030
89	B00281L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
90	B00282L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
91	B00283L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
92	B00284L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
93	B00291L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002
94	B00292L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002

END FORM

94 STRAINS

Strains isolated from sediment at 4C capable of growth at pH 6.

1	B00026L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
2	B00027L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
3	B00028L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
4	B00029L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
5	B00030L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
6	B00031L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
7	B00032L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
8	B00033L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
9	B00034L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
10	B00035L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
11	B00036L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
12	B00037L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
13	B00038L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
14	B00039L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
15	B00040L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
16	B00041L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
17	B00042L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
18	B00044L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
19	B00047L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
20	B00048L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
21	B00049L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
22	B00050L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
23	B00076L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
24	B00077L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
25	B00078L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
26	B00079L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
27	B00080L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
28	B00081L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
29	B00082L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
30	B00083L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
31	B00085L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
32	B00086L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
33	B00087L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
34	B00088L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
35	B00089L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
36	B00091L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
37	B00092L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
38	B00093L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
39	B00094L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
40	B00095L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
41	B00096L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
42	B00097L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
43	B00098L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
44	B00099L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
45	B00100L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
46	B00126L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
47	B00128L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
48	B00129L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
49	B00130L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
50	B00131L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071

51	B00132L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
52	B00133L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
53	B00134L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
54	B00135L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
55	B00136L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
56	B00137L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
57	B00138L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
58	B00140L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
59	B00141L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
60	B00143L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
61	B00144L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
62	B00145L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
63	B00147L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
64	B00148L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
65	B00149L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
66	B00150L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
67	B00178L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
68	B00179L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
69	B00180L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
70	B00181L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
71	B00182L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
72	B00183L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
73	B00184L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
74	B00185L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
75	B00186L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
76	B00187L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
77	B00188L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
78	B00189L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
79	B00191L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
80	B00192L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
81	B00194L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
82	B00195L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
83	B00197L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
84	B00198L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
85	B00200L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
86	B00227L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
87	B00228L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
88	B00229L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
89	B00230L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
90	B00232L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
91	B00234L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
92	B00235L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
93	B00236L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
94	B00237L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
95	B00238L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
96	B00239L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
97	B00240L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
98	B00241L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
99	B00242L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
100	B00243L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070

101	B00244L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
102	B00245L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
103	B00246L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
104	B00247L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
105	B00248L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
106	B00249L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
107	B00250L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
108	B00251L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
109	B00252L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
110	B00253L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
111	B00254L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
112	B00256L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
113	B00257L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
114	B00259L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
115	B00261L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
116	B00262L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
117	B00263L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
118	B00264L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
119	B00265L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
120	B00266L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
121	B00267L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
122	B00268L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
123	B00269L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
124	B00272L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
125	B00273L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
126	B00274L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
127	B00275L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
128	B00286L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
129	B00287L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
130	B00288L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
131	B00289L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
132	B00290L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
133	B00296L	BEAUFORT	SAMPLE	32	SEDIMENT	04C	STATION002
134	B00297L	BEAUFORT	SAMPLE	32	SEDIMENT	04C	STATION002
135	B00299L	BEAUFORT	SAMPLE	32	SEDIMENT	04C	STATION002

END FORM
135 STRAINS

Strains isolated from water at 20C capable of growth at pH 6.

1	B00001H	BEAUFORT SAMPLE 03 WATER 20C STATION010
2	B00002H	BEAUFORT SAMPLE 03 WATER 20C STATION010
3	B00003H	BEAUFORT SAMPLE 03 WATER 20C STATION010
4	00004H	BEAUFORT SAMPLE 03 WATER 20C STATION010
5	B00005H	BEAUFORT SAMPLE 03 WATER 20C STATION010
6	B00006H	BEAUFORT SAMPLE 03 WATER 20C STATION010
7	B00007H	BEAUFORT SAMPLE 03 WATER 20C STATION010
8	B00008H	BEAUFORT SAMPLE 03 WATER 20C STATION010
9	B00009H	BEAUFORT SAMPLE 03 WATER 20C STATION010
10	B00010H	BEAUFORT SAMPLE 03 WATER 20C STATION010
11	B00011H	BEAUFORT SAMPLE 03 WATER 20C STATION010
12	B00012H	BEAUFORT SAMPLE 03 WATER 20C STATION010
13	B00013H	BEAUFORT SAMPLE 03 WATER 20C STATION010
14	B00014H	BEAUFORT SAMPLE 03 WATER 20C STATION010
15	B00015H	BEAUFORT SAMPLE 03 WATER 20C STATION010
16	B00016H	BEAUFORT SAMPLE 03 WATER 20C STATION010
17	B00017H	BEAUFORT SAMPLE 03 WATER 20C STATION010
18	B00018H	BEAUFORT SAMPLE 03 WATER 20C STATION010
19	B00019H	BEAUFORT SAMPLE 03 WATER 20C STATION010
20	B00020H	BEAUFORT SAMPLE 03 WATER 20C STATION010
21	B00021H	BEAUFORT SAMPLE 03 WATER 20C STATION010
22	B00022H	BEAUFORT SAMPLE 03 WATER 20C STATION010
23	B00023H	BEAUFORT SAMPLE 03 WATER 20C STATION010
24	B00024H	BEAUFORT SAMPLE 03 WATER 20C STATION010
25	B00051H	BEAUFORT SAMPLE 20 WATER 20C STATION020
26	B00052H	BEAUFORT SAMPLE 20 WATER 20C STATION020
27	B00053H	BEAUFORT SAMPLE 20 WATER 20C STATION020
28	B00054H	BEAUFORT SAMPLE 20 WATER 20C STATION020
29	B00055H	BEAUFORT SAMPLE 20 WATER 20C STATION020
30	B00056H	BEAUFORT SAMPLE 20 WATER 20C STATION020
31	B00057H	BEAUFORT SAMPLE 20 WATER 20C STATION020
32	B00058H	BEAUFORT SAMPLE 20 WATER 20C STATION002
33	B00059H	BEAUFORT SAMPLE 20 WATER 20C STATION002
34	B00060H	BEAUFORT SAMPLE 20 WATER 20C STATION002
35	B00061H	BEAUFORT SAMPLE 20 WATER 20C STATION002
36	B00062H	BEAUFORT SAMPLE 20 WATER 20C STATION002
37	B00063H	BEAUFORT SAMPLE 20 WATER 20C STATION002
38	B00064H	BEAUFORT SAMPLE 20 WATER 20C STATION002
39	B00065H	BEAUFORT SAMPLE 20 WATER 20C STATION002
40	B00066H	BEAUFORT SAMPLE 20 WATER 20C STATION002
41	B00067H	BEAUFORT SAMPLE 20 WATER 20C STATION002
42	B00068H	BEAUFORT SAMPLE 20 WATER 20C STATION002
43	B00069H	BEAUFORT SAMPLE 20 WATER 20C STATION002
44	B00070H	BEAUFORT SAMPLE 20 WATER 20C STATION002
45	B00071H	BEAUFORT SAMPLE 20 WATER 20C STATION002
46	B00072H	BEAUFORT SAMPLE 20 WATER 20C STATION002
47	B00073H	BEAUFORT SAMPLE 20 WATER 20C STATION002
48	B00075H	BEAUFORT SAMPLE 20 WATER 20C STATION002
49	B00101H	BEAUFORT SAMPLE 27 WATER 20C STATION071
50	B00102H	BEAUFORT SAMPLE 27 WATER 20C STATION071

51	B00103H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
52	B00104H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
53	B00106H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
54	B00109H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
55	B00110H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
56	B00111H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
57	B00112H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
58	B00113H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
59	B00114H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
60	B00115H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
61	B00116H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
62	B00117H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
63	B00118H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
64	B00119H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
65	B00120H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
66	B00121H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
67	B00122H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
68	B00123H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
69	B00151H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
70	B00152H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
71	B00153H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
72	B00154H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
73	B00155H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
74	B00156H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
75	B00157H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
76	B00158H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
77	B00159H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
78	B00160H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
79	B00161H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
80	B00162H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
81	B00163H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
82	B00164H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
83	B00165H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
84	B00166H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
85	B00168H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
86	B00169H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
87	B00170H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
88	B00201H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
89	B00202H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
90	B00203H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
91	B00204H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
92	B00205H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
93	B00206H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
94	B00207H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
95	B00208H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
96	B00210H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
97	B00211H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
98	B00212H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
99	B00213H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
100	B00216H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070

101	B00217H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
102	B00219H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
103	B00221H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
104	B00222H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
105	B00223H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
106	B00251H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
107	B00252H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
108	B00253H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
109	B00254H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
110	B00255H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
111	B00256H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
112	B00257H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
113	B00258H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
114	B00259H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
115	B00260H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
116	B00261H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
117	B00262H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
118	B00263H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
119	B00264H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
120	B00265H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
121	B00266H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
122	B00268H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
123	B00269H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
124	B00270H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
125	B00271H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
126	B00272H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
127	B00273H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
128	B00275H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030

END FORM
128 STRAINS

Strains isolated from sediment at 20C capable of growth at pH 6.

1	B00026H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
2	B00027H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
3	B00028H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
4	B00029H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
5	B00030H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
6	B00031H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
7	B00032H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
8	B00033H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
9	B00035H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
10	B00036H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
11	B00037H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
12	B00038H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
13	B00039H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
14	B00040H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
15	B00041H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
16	B00042H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
17	B00043H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
18	B00044H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
19	B00045H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
20	B00047H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
21	B00048H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
22	B00076H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
23	B00077H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
24	B00078H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
25	B00079H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
26	B00080H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
27	B00081H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
28	B00082H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
29	B00083H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
30	B00084H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
31	B00085H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
32	B00086H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
33	B00087H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
34	B00088H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
35	B00089H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
36	B00091H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
37	B00092H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
38	B00093H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
39	B00094H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
40	B00095H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
41	B00096H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
42	B00097H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
43	B00098H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
44	B00099H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
45	B00100H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
46	B00126H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
47	B00127H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
48	B00128H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
49	B00129H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
50	B00130H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071

51	B00131H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
52	B00132H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
53	B00133H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
54	B00135H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
55	B00136H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
56	B00138H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
57	B00139H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
58	B00140H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
59	B00141H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
60	B00142H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
61	B00143H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
62	B00144H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
63	B00145H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
64	B00146H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
65	B00147H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
66	B00148H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
67	B00149H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
68	B00150H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
69	B00176H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
70	B00177H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
71	B00178H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
72	B00179H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
73	B00180H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
74	B00181H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
75	B00183H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
76	B00184H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
77	B00185H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
78	B00186H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
79	B00187H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
80	B00188H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
81	B00189H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
82	B00190H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
83	B00191H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
84	B00192H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
85	B00193H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
86	B00194H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
87	B00195H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
88	B00196H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
89	B00197H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
90	B00198H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
91	B00199H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
92	B00200H	BEAUFORT SAMPLE 20 SEDIMENT 20C STATION055
93	B00226H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
94	B00227H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
95	B00228H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070

96	B00229H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
97	B00230H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
98	B00231H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
99	B00232H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
100	B00233H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
101	B00234H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
102	B00235H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
103	B00236H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
104	B00237H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
105	B00238H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
106	B00239H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
107	B00240H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
108	B00241H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
109	B00242H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
110	B00243H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
111	B00244H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
112	B00245H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
113	B00246H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
114	B00247H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
115	B00248H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
116	B00249H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
117	B00250H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
118	B00276H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
119	B00277H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
120	R00278H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
121	B00279H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
122	B00280H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
123	B00281H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
124	B00282H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
125	B00283H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
126	B00284H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
127	B00285H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
128	B00286H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
129	B00287H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
130	B00288H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
131	B00289H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
132	B00290H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
133	B00292H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
134	B00293H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
135	B00294H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
136	B00295H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
137	B00296H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
138	B00297H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
139	B00298H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
140	B00299H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
141	B00300H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030

END FORM

141 STRAINS

Strains isolated from water at 4C capable of growth at pH 7.

1	B00003L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
2	B00005L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
3	B00006L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
4	B00013L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
5	B00014L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
6	B00015L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
7	B00021L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
8	B00022L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
9	B00023L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
10	B00024L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
11	B00025L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
12	B00052L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
13	B00053L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
14	B00054L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
15	B00055L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
16	B00059L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
17	B00060L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
18	B00062L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
19	B00063L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
20	B00066L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
21	B00067L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
22	B00068L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
23	B00069L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
24	B00070L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
25	B00071L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
26	B00072L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
27	B00073L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
28	B00074L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
29	B00075L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
30	B00101L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
31	B00102L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
32	B00103L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
33	B00104L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
34	B00105L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
35	B00106L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
36	B00107L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
37	B00108L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
38	B00109L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
39	B00111L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
40	B00113L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
41	B00114L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
42	B00115L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
43	B00116L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
44	B00117L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
45	B00118L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
46	B00119L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
47	B00120L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
48	B00121L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
49	B00122L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
50	B00123L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071

51	B00124L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
52	B00125L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
53	B00152L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
54	B00153L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
55	B00154L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
56	B00155L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
57	B00156L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
58	B00157L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
59	B00159L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
60	B00160L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
61	B00162L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
62	B00163L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
63	B00164L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
64	B00165L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
65	B00166L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
66	B00167L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
67	B00168L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
68	B00169L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
69	B00170L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
70	B00171L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
71	B00172L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
72	B00173L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
73	B00174L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
74	B00175L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
75	B00201L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
76	B00202L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
77	B00203L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
78	B00205L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
79	B00206L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
80	B00207L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
81	B00208L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
82	B00209L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
83	B00210L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
84	B00211L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
85	B00212L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
86	B00213L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
87	B00214L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
88	B00215L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
89	B00216L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
90	B00217L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
91	B00218L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
92	B00219L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
93	B00220L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
94	B00221L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
95	B00278L	BEAUFORT	SAMPLE	11	WATER	04C	STATION030
96	B00280L	BEAUFORT	SAMPLE	11	WATER	04C	STATION030
97	B00281L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
98	B00282L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
99	B00283L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
100	B00284L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
101	B00291L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002
102	B00292L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002

END FORM
102 STRAINS

Strains isolated from sediment at 4C capable of growth at pH 7.

1	B00026L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
2	B00027L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
3	B00028L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
4	B00029L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
5	B00030L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
6	B00031L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
7	B00032L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
8	B00033L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
9	B00034L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
10	B00035L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
11	B00036L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
12	B00037L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
13	B00038L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
14	B00039L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
15	B00040L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
16	B00041L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
17	B00042L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
18	B00044L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
19	B00047L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
20	B00048L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
21	B00049L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
22	B00050L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
23	B00076L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
24	B00077L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
25	B00078L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
26	B00079L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
27	B00080L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
28	B00081L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
29	B00082L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
30	B00083L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
31	B00084L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
32	B00085L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
33	B00086L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
34	B00087L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
35	B00088L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
36	B00089L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
37	B00091L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
38	B00092L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
39	B00093L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
40	B00094L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
41	B00095L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
42	B00096L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
43	B00097L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
44	B00098L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
45	B00099L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
46	B00100L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
47	B00126L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
48	B00128L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
49	B00129L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
50	B00130L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071

51	B00131L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
52	B00132L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
53	B00133L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
54	B00134L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
55	B00135L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
56	B00136L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
57	B00137L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
58	B00138L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
59	B00140L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
60	B00141L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
61	B00143L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
62	B00144L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
63	B00145L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
64	B00146L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
65	B00147L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
66	B00148L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
67	B00149L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
68	B00150L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
69	B00178L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
70	B00179L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
71	B00180L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
72	B00181L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
73	B00182L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
74	B00183L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
75	B00184L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
76	B00185L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
77	B00186L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
78	B00187L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
79	B00188L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
80	B00189L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
81	B00191L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
82	B00192L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
83	B00194L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
84	B00195L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
85	B00198L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
86	B00200L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
87	B00226L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
88	B00227L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
89	B00228L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
90	B00229L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
91	B00230L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
92	B00232L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
93	B00234L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
94	B00235L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
95	B00236L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
96	B00237L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
97	B00238L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
98	B00239L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
99	B00240L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
100	B00241L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070

101	B00242L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
102	B00243L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
103	B00244L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
104	B00245L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
105	B00246L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
106	B00247L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
107	B00248L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
108	B00249L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
109	B00250L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
110	B00251L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
111	B00252L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
112	B00253L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
113	B00254L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
114	B00256L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
115	B00257L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
116	B00259L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
117	B00261L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
118	B00262L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
119	B00263L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
120	B00264L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
121	B00265L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
122	B00266L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
123	B00267L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
124	B00268L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
125	B00269L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
126	B00272L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
127	B00273L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
128	B00274L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
129	B00275L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
130	B00286L	BEAUFORT SAMPLE 15 SEDIMENT 04C STATION001
131	B00287L	BEAUFORT SAMPLE 15 SEDIMENT 04C STATION001
132	B00288L	BEAUFORT SAMPLE 15 SEDIMENT 04C STATION001
133	B00289L	BEAUFORT SAMPLE 15 SEDIMENT 04C STATION001
134	B00290L	BEAUFORT SAMPLE 15 SEDIMENT 04C STATION001
135	B00296L	BEAUFORT SAMPLE 32 SEDIMENT 04C STATION002
136	B00297L	BEAUFORT SAMPLE 32 SEDIMENT 04C STATION002
137	B00299L	BEAUFORT SAMPLE 32 SEDIMENT 04C STATION002

END FORM

137 STRAINS

Strains isolated from water at 20C capable of growth at pH 7.

1	B00001H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
2	B00002H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
3	B00003H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
4	B00004H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
5	B00005H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
6	B00006H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
7	B00007H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
8	B00008H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
9	B00009H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
10	B00010H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
11	B00011H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
12	B00012H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
13	B00013H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
14	B00014H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
15	B00015H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
16	B00016H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
17	B00017H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
18	B00018H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
19	B00019H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
20	B00020H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
21	B00021H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
22	B00022H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
23	B00023H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
24	B00024H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
25	B00051H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
26	B00052H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
27	B00053H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
28	B00054H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
29	B00055H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
30	B00056H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
31	B00057H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
32	B00058H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
33	B00059H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
34	B00060H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
35	B00061H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
36	B00062H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
37	B00063H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
38	B00064H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
39	B00065H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
40	B00066H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
41	B00067H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
42	B00068H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
43	B00069H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
44	B00070H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
45	B00071H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
46	B00072H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
47	B00073H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
48	B00075H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
49	B00101H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
50	B00102H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071

51	B00103H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
52	B00104H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
53	B00106H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
54	B00109H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
55	B00110H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
56	B00111H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
57	B00112H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
58	B00113H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
59	B00114H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
60	B00115H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
61	B00116H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
62	B00117H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
63	B00118H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
64	B00119H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
65	B00120H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
66	B00121H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
67	B00122H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
68	B00123H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
69	B00151H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
70	B00152H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
71	B00153H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
72	B00154H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
73	B00155H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
74	B00156H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
75	B00157H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
76	B00158H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
77	B00159H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
78	B00160H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
79	B00161H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
80	B00162H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
81	B00163H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
82	B00164H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
83	B00165H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
84	B00166H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
85	B00168H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
86	B00169H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
87	B00170H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
88	B00201H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
89	B00202H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
90	B00203H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
91	B00204H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
92	B00205H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
93	B00206H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
94	B00207H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
95	B00208H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
96	B00210H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
97	B00211H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
98	B00212H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
99	B00213H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
100	B00216H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070

101	B00217H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
102	B00219H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
103	B00221H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
104	B00222H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
105	B00223H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
106	B00251H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
107	B00252H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
108	B00253H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
109	B00254H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
110	B00255H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
111	B00256H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
112	B00257H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
113	B00258H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
114	B00259H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
115	B00260H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
116	B00261H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
117	B00262H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
118	B00263H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
119	B00264H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
120	B00265H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
121	B00266H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
122	B00268H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
123	B00269H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
124	B00270H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
125	B00271H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
126	B00272H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
127	B00273H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
128	B00275H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030

END FORM
128 STRAINS

Strains isolated from sediment at 20C capable of growth at pH 7.

1	B00026H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
2	B00027H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
3	B00028H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
4	B00029H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
5	B00030H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
6	B00031H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
7	B00032H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
8	B00033H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
9	B00035H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
10	B00036H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
11	B00037H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
12	B00038H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
13	B00039H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
14	B00040H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
15	B00042H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
16	B00043H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
17	B00044H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
18	B00045H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
19	B00047H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
20	B00048H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
21	B00076H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
22	B00077H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
23	B00078H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
24	B00079H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
25	B00080H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
26	B00081H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
27	B00082H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
28	B00083H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
29	B00084H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
30	B00085H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
31	B00086H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
32	B00087H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
33	B00088H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
34	B00089H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
35	B00091H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
36	B00092H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
37	B00093H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
38	B00094H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
39	B00095H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
40	B00096H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
41	B00097H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
42	B00098H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
43	B00099H	BEAUFORT SAMPLE 16 SEDIMENT 20C STATION002
44	B00126H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
45	B00127H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
46	B00128H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
47	B00129H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
48	B00130H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
49	B00131H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071
50	B00132H	BEAUFORT SAMPLE 22 SEDIMENT 20C STATION071

51	B00133H	BEAUFORT	SAMPLE 22	SEDIMENT	20C	STATION071
52	B00135H	BEAUFORT	SAMPLE 22	SEDIMENT	20C	STATION071
53	B00136H	BEAUFORT	SAMPLE 22	SEDIMENT	20C	STATION071
54	B00138H	BEAUFORT	SAMPLE 22	SEDIMENT	20C	STATION071
55	B00139H	BEAUFORT	SAMPLE 22	SEDIMENT	20C	STATION071
56	B00140H	BEAUFORT	SAMPLE 22	SEDIMENT	20C	STATION071
57	B00141H	BEAUFORT	SAMPLE 22	SEDIMENT	20C	STATION071
58	B00142H	BEAUFORT	SAMPLE 22	SEDIMENT	20C	STATION071
59	B00143H	BEAUFORT	SAMPLE 22	SEDIMENT	20C	STATION071
60	B00144H	BEAUFORT	SAMPLE 22	SEDIMENT	20C	STATION071
61	B00145H	BEAUFORT	SAMPLE 22	SEDIMENT	20C	STATION071
62	B00146H	BEAUFORT	SAMPLE 22	SEDIMENT	20C	STATION071
63	B00147H	BEAUFORT	SAMPLE 22	SEDIMENT	20C	STATION071
64	B00148H	BEAUFORT	SAMPLE 22	SEDIMENT	20C	STATION071
65	B00149H	BEAUFORT	SAMPLE 22	SEDIMENT	20C	STATION071
66	B00150H	BEAUFORT	SAMPLE 22	SEDIMENT	20C	STATION071
67	B00176H	BEAUFORT	SAMPLE 20	SEDIMENT	20C	STATION055
68	B00177H	BEAUFORT	SAMPLE 20	SEDIMENT	20C	STATION055
69	B00178H	BEAUFORT	SAMPLE 20	SEDIMENT	20C	STATION055
70	B00179H	BEAUFORT	SAMPLE 20	SEDIMENT	20C	STATION055
71	B00180H	BEAUFORT	SAMPLE 20	SEDIMENT	20C	STATION055
72	B00181H	BEAUFORT	SAMPLE 20	SEDIMENT	20C	STATION055
73	B00183H	BEAUFORT	SAMPLE 20	SEDIMENT	20C	STATION055
74	B00184H	BEAUFORT	SAMPLE 20	SEDIMENT	20C	STATION055
75	B00185H	BEAUFORT	SAMPLE 20	SEDIMENT	20C	STATION055
76	B00186H	BEAUFORT	SAMPLE 20	SEDIMENT	20C	STATION055
77	B00187H	BEAUFORT	SAMPLE 20	SEDIMENT	20C	STATION055
78	B00188H	BEAUFORT	SAMPLE 20	SEDIMENT	20C	STATION055
79	B00189H	BEAUFORT	SAMPLE 20	SEDIMENT	20C	STATION055
80	B00190H	BEAUFORT	SAMPLE 20	SEDIMENT	20C	STATION055
81	B00192H	BEAUFORT	SAMPLE 20	SEDIMENT	20C	STATION055
82	B00193H	BEAUFORT	SAMPLE 20	SEDIMENT	20C	STATION055
83	B00194H	BEAUFORT	SAMPLE 20	SEDIMENT	20C	STATION055
84	B00195H	BEAUFORT	SAMPLE 20	SEDIMENT	20C	STATION055
85	B00196H	BEAUFORT	SAMPLE 20	SEDIMENT	20C	STATION055
86	B00197H	BEAUFORT	SAMPLE 20	SEDIMENT	20C	STATION055
87	B00199H	BEAUFORT	SAMPLE 20	SEDIMENT	20C	STATION055
88	B00200H	BEAUFORT	SAMPLE 20	SEDIMENT	20C	STATION055
89	B00226H	BEAUFORT	SAMPLE 21	SEDIMENT	20C	STATION070
90	B00227H	BEAUFORT	SAMPLE 21	SEDIMENT	20C	STATION070
91	B00228H	BEAUFORT	SAMPLE 21	SEDIMENT	20C	STATION070
92	B00229H	BEAUFORT	SAMPLE 21	SEDIMENT	20C	STATION070
93	B00230H	BEAUFORT	SAMPLE 21	SEDIMENT	20C	STATION070
94	B00231H	BEAUFORT	SAMPLE 21	SEDIMENT	20C	STATION070
95	B00232H	BEAUFORT	SAMPLE 21	SEDIMENT	20C	STATION070
96	B00233H	BEAUFORT	SAMPLE 21	SEDIMENT	20C	STATION070
97	B00234H	BEAUFORT	SAMPLE 21	SEDIMENT	20C	STATION070
98	B00235H	BEAUFORT	SAMPLE 21	SEDIMENT	20C	STATION070
99	B00236H	BEAUFORT	SAMPLE 21	SEDIMENT	20C	STATION070
100	B00237H	BEAUFORT	SAMPLE 21	SEDIMENT	20C	STATION070

101	B00238H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
102	B00239H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
103	B00240H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
104	B00241H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
105	B00242H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
106	B00243H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
107	B00244H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
108	B00245H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
109	B00246H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
110	B00247H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
111	B00248H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
112	B00249H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
113	B00250H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
114	B00276H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
115	B00277H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
116	B00278H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
117	B00279H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
118	B00280H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
119	B00281H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
120	B00282H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
121	B00283H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
122	B00284H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
123	B00285H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
124	B00286H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
125	B00287H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
126	B00288H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
127	B00289H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
128	B00290H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
129	B00292H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
130	B00293H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
131	B00294H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
132	B00295H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
133	B00296H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
134	B00297H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
135	B00298H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
136	B00299H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
137	B00300H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030

END FORM
137 STRAINS

Strains isolated from water at 4C capable of growth at either pH 8 or pH 9.

1	B00003L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
2	B00005L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
3	B00006L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
4	B00009L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
5	B00012L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
6	B00013L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
7	B00014L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
8	B00015L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
9	B00021L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
10	B00022L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
11	B00023L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
12	B00024L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
13	B00025L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
14	B00052L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
15	B00053L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
16	B00054L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
17	B00055L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
18	B00057L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
19	B00059L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
20	B00060L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
21	B00062L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
22	B00063L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
23	B00066L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
24	B00067L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
25	B00068L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
26	B00069L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
27	B00070L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
28	B00071L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
29	B00072L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
30	B00073L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
31	B00074L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
32	B00075L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
33	B00101L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
34	B00102L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
35	B00103L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
36	B00104L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
37	B00105L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
38	B00106L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
39	B00107L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
40	B00108L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
41	B00109L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
42	B00111L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
43	B00112L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
44	B00113L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
45	B00114L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
46	B00115L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
47	B00116L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
48	B00117L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
49	B00118L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
50	B00119L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071

51	B00120L	BEAUFORT	SAMPLE	27	WATER 04C	STATION071
52	B00121L	BEAUFORT	SAMPLE	27	WATER 04C	STATION071
53	B00122L	BEAUFORT	SAMPLE	27	WATER 04C	STATION071
54	B00123L	BEAUFORT	SAMPLE	27	WATER 04C	STATION071
55	B00124L	BEAUFORT	SAMPLE	27	WATER 04C	STATION071
56	B00125L	BEAUFORT	SAMPLE	27	WATER 04C	STATION071
57	B00151L	BEAUFORT	SAMPLE	24	WATER 04C	STATION055
58	B00152L	BEAUFORT	SAMPLE	24	WATER 04C	STATION055
59	B00153L	BEAUFORT	SAMPLE	24	WATER 04C	STATION055
60	B00154L	BEAUFORT	SAMPLE	24	WATER 04C	STATION055
61	B00155L	BEAUFORT	SAMPLE	24	WATER 04C	STATION055
62	B00156L	BEAUFORT	SAMPLE	24	WATER 04C	STATION055
63	B00157L	BEAUFORT	SAMPLE	24	WATER 04C	STATION055
64	B00159L	BEAUFORT	SAMPLE	24	WATER 04C	STATION055
65	B00160L	BEAUFORT	SAMPLE	24	WATER 04C	STATION055
66	B00162L	BEAUFORT	SAMPLE	24	WATER 04C	STATION055
67	B00163L	BEAUFORT	SAMPLE	24	WATER 04C	STATION055
68	B00164L	BEAUFORT	SAMPLE	24	WATER 04C	STATION055
69	B00165L	BEAUFORT	SAMPLE	24	WATER 04C	STATION055
70	B00166L	BEAUFORT	SAMPLE	24	WATER 04C	STATION055
71	B00167L	BEAUFORT	SAMPLE	24	WATER 04C	STATION055
72	B00168L	BEAUFORT	SAMPLE	24	WATER 04C	STATION055
73	B00169L	BEAUFORT	SAMPLE	24	WATER 04C	STATION055
74	B00170L	BEAUFORT	SAMPLE	24	WATER 04C	STATION055
75	B00171L	BEAUFORT	SAMPLE	24	WATER 04C	STATION055
76	B00172L	BEAUFORT	SAMPLE	24	WATER 04C	STATION055
77	B00173L	BEAUFORT	SAMPLE	24	WATER 04C	STATION055
78	B00174L	BEAUFORT	SAMPLE	24	WATER 04C	STATION055
79	B00175L	BEAUFORT	SAMPLE	24	WATER 04C	STATION055
80	B00201L	BEAUFORT	SAMPLE	26	WATER 04C	STATION070
81	B00202L	BEAUFORT	SAMPLE	26	WATER 04C	STATION070
82	B00203L	BEAUFORT	SAMPLE	26	WATER 04C	STATION070
83	B00205L	BEAUFORT	SAMPLE	26	WATER 04C	STATION070
84	B00206L	BEAUFORT	SAMPLE	26	WATER 04C	STATION070
85	B00207L	BEAUFORT	SAMPLE	26	WATER 04C	STATION070
86	B00208L	BEAUFORT	SAMPLE	26	WATER 04C	STATION070
87	B00209L	BEAUFORT	SAMPLE	26	WATER 04C	STATION070
88	B00210L	BEAUFORT	SAMPLE	26	WATER 04C	STATION070
89	B00211L	BEAUFORT	SAMPLE	26	WATER 04C	STATION070
90	B00212L	BEAUFORT	SAMPLE	26	WATER 04C	STATION070
91	B00213L	BEAUFORT	SAMPLE	26	WATER 04C	STATION070
92	B00214L	BEAUFORT	SAMPLE	26	WATER 04C	STATION070
93	B00215L	BEAUFORT	SAMPLE	26	WATER 04C	STATION070
94	B00216L	BEAUFORT	SAMPLE	26	WATER 04C	STATION070
95	B00217L	BEAUFORT	SAMPLE	26	WATER 04C	STATION070
96	B00218L	BEAUFORT	SAMPLE	26	WATER 04C	STATION070
97	B00219L	BEAUFORT	SAMPLE	26	WATER 04C	STATION070
98	B00220L	BEAUFORT	SAMPLE	26	WATER 04C	STATION070
99	B00221L	BEAUFORT	SAMPLE	26	WATER 04C	STATION070
100	B00222L	BEAUFORT	SAMPLE	26	WATER 04C	STATION070

101	B00223L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
102	B00224L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
103	B00278L	BEAUFORT	SAMPLE	11	WATER	04C	STATION030
104	B00280L	BEAUFORT	SAMPLE	11	WATER	04C	STATION030
105	B00281L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
106	B00282L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
107	B00283L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
108	B00284L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
109	B00291L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002
110	B00292L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002

END FORM
110 STRAINS

Strains isolated from sediment at 4C capable of growth at pH 8 or pH 9.

1	B00026L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
2	B00027L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
3	B00028L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
4	B00029L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
5	B00030L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
6	B00031L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
7	B00032L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
8	B00033L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
9	B00034L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
10	B00035L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
11	B00036L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
12	B00037L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
13	B00038L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
14	B00039L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
15	B00040L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
16	B00041L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
17	B00042L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
18	B00043L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
19	B00044L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
20	B00046L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
21	B00047L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
22	B00048L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
23	B00049L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
24	B00050L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
25	B00076L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
26	B00077L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
27	B00078L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
28	B00079L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
29	B00080L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
30	B00082L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
31	B00083L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
32	B00084L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
33	B00085L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
34	B00086L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
35	B00087L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
36	B00088L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
37	B00089L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
38	B00091L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
39	B00092L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
40	B00093L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
41	B00094L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
42	B00095L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
43	B00096L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
44	B00097L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
45	B00098L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
46	B00099L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
47	B00100L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
48	B00126L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
49	B00127L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
50	B00128L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071

51	B00129L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
52	B00130L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
53	B00131L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
54	B00132L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
55	B00133L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
56	B00134L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
57	B00135L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
58	B00136L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
59	B00137L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
60	B00138L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
61	B00140L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
62	B00141L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
63	B00143L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
64	B00144L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
65	B00145L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
66	B00146L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
67	B00147L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
68	B00148L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
69	B00149L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
70	B00150L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
71	B00176L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
72	B00178L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
73	B00179L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
74	B00180L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
75	B00181L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
76	B00182L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
77	B00183L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
78	B00184L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
79	B00185L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
80	B00186L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
81	B00187L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
82	B00188L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
83	B00189L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
84	B00190L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
85	B00191L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
86	B00192L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
87	B00194L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
88	B00195L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
89	B00196L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
90	B00198L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
91	B00199L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
92	B00200L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
93	B00226L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
94	B00227L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
95	B00228L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
96	B00229L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
97	B00230L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
98	B00232L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
99	B00233L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
100	B00234L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070

101	B00235L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
102	B00236L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
103	B00237L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
104	B00238L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
105	B00240L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
106	B00241L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
107	B00242L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
108	B00243L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
109	B00244L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
110	B00245L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
111	B00246L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
112	B00247L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
113	B00248L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
114	B00249L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
115	B00250L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
116	B00251L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
117	B00252L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
118	B00253L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
119	B00254L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
120	B00256L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
121	B00257L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
122	B00258L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
123	B00259L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
124	B00261L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
125	B00262L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
126	B00263L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
127	B00264L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
128	B00265L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
129	B00266L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
130	B00267L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
131	B00268L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
132	B00269L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
133	B00271L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
134	B00272L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
135	B00273L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
136	B00274L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
137	B00275L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
138	B00286L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
139	B00287L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
140	B00288L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
141	B00289L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
142	B00290L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
143	B00296L	BEAUFORT	SAMPLE	32	SEDIMENT	04C	STATION002
144	B00297L	BEAUFORT	SAMPLE	32	SEDIMENT	04C	STATION002
145	B00298L	BEAUFORT	SAMPLE	32	SEDIMENT	04C	STATION002
146	B00299L	BEAUFORT	SAMPLE	32	SEDIMENT	04C	STATION002

END FORM

146 STRAINS

Strains isolated from water at 20C capable of growth at pH 8 or pH 9.

1	B00001H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
2	B00002H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
3	B00003H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
4	B00004H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
5	B00005H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
6	B00006H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
7	B00007H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
8	B00008H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
9	B00009H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
10	B00010H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
11	B00011H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
12	B00012H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
13	B00013H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
14	B00014H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
15	B00015H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
16	B00016H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
17	B00017H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
18	B00018H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
19	B00019H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
20	B00020H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
21	B00021H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
22	B00022H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
23	B00023H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
24	B00024H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
25	B00051H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
26	B00052H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
27	B00053H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
28	B00054H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
29	B00055H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
30	B00056H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
31	B00057H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
32	B00058H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
33	B00059H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
34	B00060H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
35	B00061H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
36	B00062H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
37	B00063H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
38	B00064H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
39	B00065H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
40	B00066H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
41	B00067H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
42	B00068H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
43	B00069H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
44	B00070H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
45	B00071H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
46	B00072H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
47	B00073H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
48	B00075H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
49	B00101H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
50	B00102H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071

51	B00103H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
52	B00104H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
53	B00106H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
54	B00109H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
55	B00110H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
56	B00111H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
57	B00112H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
58	B00113H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
59	B00114H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
60	B00115H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
61	B00116H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
62	B00117H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
63	B00118H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
64	B00119H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
65	B00120H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
66	B00121H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
67	B00122H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
68	B00123H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
69	B00151H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
70	B00152H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
71	B00153H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
72	B00154H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
73	B00155H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
74	B00156H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
75	B00157H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
76	B00158H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
77	B00159H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
78	B00160H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
79	B00161H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
80	B00162H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
81	B00163H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
82	B00164H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
83	B00165H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
84	B00166H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
85	B00168H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
86	B00169H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
87	B00170H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
88	B00201H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
89	B00202H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
90	B00203H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
91	B00204H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
92	B00205H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
93	B00206H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
94	B00207H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
95	B00208H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
96	B00210H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
97	B00211H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
98	B00212H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
99	B00213H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
100	B00216H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070

101	B00217H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
102	B00219H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
103	B00221H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
104	B00222H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
105	B00223H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
106	B00251H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
107	B00252H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
108	B00253H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
109	B00254H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
110	B00255H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
111	B00256H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
112	B00257H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
113	B00258H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
114	B00259H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
115	B00260H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
116	B00261H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
117	B00262H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
118	B00263H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
119	B00264H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
120	B00265H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
121	B00266H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
122	B00268H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
123	B00269H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
124	B00270H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
125	B00271H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
126	B00272H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
127	B00273H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
128	B00275H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030

END FORM
128 STRAINS

Strains isolated from sediment at 20C capable of growth at pH 8 or pH 9.

1	B00026H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
2	B00027H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
3	B00028H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
4	B00029H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
5	B00030H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
6	B00031H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
7	B00032H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
8	B00033H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
9	B00035H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
10	B00036H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
11	B00037H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
12	B00038H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
13	B00039H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
14	B00040H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
15	B00041H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
16	B00042H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
17	B00043H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
18	B00044H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
19	B00045H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
20	B00047H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
21	B00048H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
22	B00076H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
23	B00077H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
24	B00078H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
25	B00079H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
26	B00081H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
27	B00082H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
28	B00083H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
29	B00084H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
30	B00085H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
31	B00086H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
32	B00087H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
33	B00088H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
34	B00089H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
35	B00091H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
36	B00092H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
37	B00093H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
38	B00094H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
39	B00095H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
40	B00096H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
41	B00097H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
42	B00098H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
43	B00099H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
44	B00126H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
45	B00127H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
46	B00128H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
47	B00129H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
48	B00130H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
49	B00131H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
50	B00132H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071

51	B00133H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
52	B00135H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
53	B00136H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
54	B00138H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
55	B00139H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
56	B00140H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
57	B00141H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
58	B00142H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
59	B00143H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
60	B00144H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
61	B00145H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
62	B00146H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
63	B00147H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
64	B00148H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
65	B00149H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
66	B00150H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
67	B00176H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
68	B00177H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
69	B00178H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
70	B00179H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
71	B00180H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
72	B00181H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
73	B00183H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
74	B00184H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
75	B00185H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
76	B00186H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
77	B00187H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
78	B00188H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
79	B00189H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
80	B00190H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
81	B00191H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
82	B00192H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
83	B00193H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
84	B00194H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
85	B00195H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
86	B00196H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
87	B00197H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
88	B00198H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
89	B00199H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
90	B00200H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
91	B00226H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
92	B00227H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
93	B00228H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
94	B00229H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
95	B00230H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
96	B00231H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
97	B00232H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
98	B00233H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
99	B00234H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
100	B00235H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070

101	B00236H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
102	B00237H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
103	B00238H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
104	B00239H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
105	B00240H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
106	B00241H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
107	B00242H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
108	B00243H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
109	B00244H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
110	B00245H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
111	B00246H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
112	B00247H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
113	B00248H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
114	B00249H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
115	B00250H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
116	B00276H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
117	B00277H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
118	B00278H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
119	B00279H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
120	B00280H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
121	B00281H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
122	B00282H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
123	B00283H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
124	B00284H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
125	B00285H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
126	B00286H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
127	B00287H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
128	B00288H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
129	B00289H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
130	B00290H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
131	B00292H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
132	B00293H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
133	B00294H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
134	B00295H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
135	B00296H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
136	B00297H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
137	B00298H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
138	B00299H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
139	B00300H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030

END FORM
139 STRAINS

Strains isolated from water at 4C capable of utilizing any of the following carbohydrates: arabinose, ribose, xylose, rhamnose, fructose, galactose, glucose, mannose, sorbose, cellobiose, lactose, maltose, sucrose, trehalose, raffinose, salicin.

1	B00005L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
2	B00006L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
3	B00013L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
4	B00014L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
5	B00024L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
6	B00025L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
7	B00052L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
8	B00054L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
9	B00057L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
10	B00058L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
11	B00059L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
12	B00060L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
13	B00062L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
14	B00063L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
15	B00071L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
16	B00073L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
17	B00074L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
18	B00075L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
19	B00102L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
20	B00103L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
21	B00104L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
22	B00106L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
23	B00107L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
24	B00108L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
25	B00109L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
26	B00111L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
27	B00112L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
28	B00113L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
29	B00114L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
30	B00115L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
31	B00116L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
32	B00117L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
33	B00119L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
34	B00120L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
35	B00121L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
36	B00122L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
37	B00123L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
38	B00125L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
39	B00151L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
40	B00152L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
41	B00153L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
42	B00154L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
43	B00155L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
44	B00156L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
45	B00157L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
46	B00159L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
47	B00160L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
48	B00163L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
49	B00164L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
50	B00165L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055

51	B00166L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
52	B00167L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
53	B00169L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
54	B00170L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
55	B00171L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
56	B00173L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
57	B00174L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
58	B00175L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
59	B00201L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
60	B00202L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
61	B00203L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
62	B00205L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
63	B00206L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
64	B00207L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
65	B00208L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
66	B00210L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
67	B00211L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
68	B00212L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
69	B00213L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
70	B00216L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
71	B00217L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
72	B00218L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
73	B00220L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
74	B00221L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
75	B00222L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
76	B00223L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
77	B00278L	BEAUFORT	SAMPLE	11	WATER	04C	STATION030
78	B00280L	BEAUFORT	SAMPLE	11	WATER	04C	STATION030
79	B00281L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
80	B00282L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
81	B00283L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
82	B00291L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002
83	B00294L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002
84	B00295L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002

END FORM
84 STRAINS

Strains isolated from sediment at 4C capable of utilizing any of the following carbohydrates: arabinose, riboxe, xylose, rhamnose, fructose, glactose, glucose, mannose, sorbose, cellobiose, lactose, maltose, sucrose, trehalose, raffinose, salicin.

1	B00026L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
2	B00027L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
3	B00028L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
4	B00029L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
5	B00030L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
6	B00031L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
7	B00032L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
8	B00035L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
9	B00039L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
10	B00040L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
11	B00041L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
12	B00044L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
13	B00047L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
14	B00048L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
15	B00049L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
16	B00076L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
17	B00077L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
18	B00078L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
19	B00080L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
20	B00082L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
21	B00084L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
22	B00086L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
23	B00087L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
24	B00089L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
25	B00091L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
26	B00092L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
27	B00094L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
28	B00095L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
29	B00096L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
30	B00097L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
31	B00098L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
32	B00099L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
33	B00100L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
34	B00126L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
35	B00127L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
36	B00129L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
37	B00131L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
38	B00133L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
39	B00135L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
40	B00137L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
41	B00138L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
42	B00140L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
43	B00141L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
44	B00143L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
45	B00144L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
46	B00145L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
47	B00146L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
48	B00148L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
49	B00149L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
50	B00176L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055

51	B00178L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
52	B00181L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
53	B00184L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
54	B00185L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
55	B00187L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
56	B00190L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
57	B00191L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
58	B00192L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
59	B00193L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
60	B00194L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
61	B00195L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
62	B00198L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
63	B00199L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
64	B00226L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
65	B00227L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
66	B00228L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
67	B00229L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
68	B00230L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
69	B00231L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
70	B00232L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
71	B00233L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
72	B00234L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
73	B00236L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
74	B00237L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
75	B00238L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
76	B00243L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
77	B00244L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
78	B00245L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
79	B00246L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
80	B00247L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
81	B00251L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
82	B00252L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
83	B00253L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
84	B00254L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
85	B00263L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
86	B00264L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
87	B00265L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
88	B00266L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
89	B00269L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
90	B00270L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
91	B00274L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
92	B00286L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
93	B00287L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
94	B00288L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
95	B00289L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
96	B00290L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
97	B00296L	BEAUFORT	SAMPLE	32	SEDIMENT	04C	STATION002
98	B00297L	BEAUFORT	SAMPLE	32	SEDIMENT	04C	STATION002
99	B00299L	BEAUFORT	SAMPLE	32	SEDIMENT	04C	STATION002

END FORM
99 STRAINS

Strains isolated from water at 20C capable of utilizing any of the following carbohydrates: arabinose, ribose, xylose, rhamnose, fructose, galactose, glucose, mannose, sorbose, cellobiose, lactose, maltose, sucrose, trehalose, raffinose, salicin.

1	B00001H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
2	B00002H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
3	B00003H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
4	B00004H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
5	B00005H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
6	B00006H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
7	B00007H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
8	B00008H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
9	B00009H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
10	B00010H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
11	B00012H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
12	B00013H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
13	B00014H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
14	B00016H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
15	B00017H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
16	B00018H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
17	B00020H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
18	B00022H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
19	B00023H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
20	B00024H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
21	B00051H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
22	B00052H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
23	B00053H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
24	B00054H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
25	B00055H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
26	B00056H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
27	B00057H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
28	B00058H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
29	B00059H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
30	B00060H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
31	B00061H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
32	B00062H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
33	B00063H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
34	B00064H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
35	B00065H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
36	B00066H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
37	B00067H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
38	B00068H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
39	B00069H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
40	B00070H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
41	B00071H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
42	B00072H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
43	B00073H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
44	B00101H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
45	B00102H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
46	B00103H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
47	B00104H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
48	B00106H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
49	B00109H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
50	B00110H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071

51	B00111H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
52	B00112H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
53	B00113H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
54	B00114H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
55	B00116H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
56	B00117H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
57	B00118H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
58	B00119H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
59	B00120H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
60	B00121H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
61	B00122H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
62	B00123H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
63	B00151H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
64	B00152H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
65	B00153H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
66	B00154H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
67	B00155H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
68	B00156H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
69	B00157H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
70	B00158H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
71	B00160H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
72	B00161H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
73	B00162H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
74	B00163H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
75	B00164H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
76	B00165H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
77	B00166H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
78	B00168H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
79	B00169H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
80	B00201H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
81	B00202H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
82	B00204H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
83	B00205H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
84	B00206H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
85	B00207H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
86	B00210H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
87	B00211H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
88	B00212H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
89	B00213H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
90	B00216H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
91	B00217H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
92	B00219H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
93	B00221H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
94	B00222H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
95	B00251H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
96	B00252H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
97	B00254H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
98	B00255H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
99	B00256H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
100	B00257H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030

101	B00258H	BEAUFORT SAMPLE 11 WATER 20C STATION030
102	B00260H	BEAUFORT SAMPLE 11 WATER 20C STATION030
103	B00261H	BEAUFORT SAMPLE 11 WATER 20C STATION030
104	B00262H	BEAUFORT SAMPLE 11 WATER 20C STATION030
105	B00263H	BEAUFORT SAMPLE 11 WATER 20C STATION030
106	B00264H	BEAUFORT SAMPLE 11 WATER 20C STATION030
107	B00265H	BEAUFORT SAMPLE 11 WATER 20C STATION030
108	B00266H	BEAUFORT SAMPLE 11 WATER 20C STATION030
109	B00268H	BEAUFORT SAMPLE 11 WATER 20C STATION030
110	B00269H	BEAUFORT SAMPLE 11 WATER 20C STATION030
111	B00270H	BEAUFORT SAMPLE 11 WATER 20C STATION030
112	B00271H	BEAUFORT SAMPLE 11 WATER 20C STATION030
113	B00272H	BEAUFORT SAMPLE 11 WATER 20C STATION030
114	B00273H	BEAUFORT SAMPLE 11 WATER 20C STATION030
115	B00275H	BEAUFORT SAMPLE 11 WATER 20C STATION030

END FORM
115 STRAINS

Strains isolated from sediment at 20C capable of utilizing any of the following carbohydrates: arabinose, ribose, xylose, rhamnose, fructose, galactose, glucose, mannose, sorbose, cellobiose, lactose, maltose, sucrose, trehalose, raffinose, salicin.

1	B00026H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
2	B00027H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
3	B00028H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
4	B00029H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
5	B00030H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
6	B00031H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
7	B00032H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
8	B00036H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
9	B00038H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
10	B00044H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
11	B00045H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
12	B00047H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
13	B00048H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
14	B00085H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
15	B00086H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
16	B00091H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
17	B00093H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
18	B00098H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
19	B00099H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
20	B00130H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
21	B00131H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
22	B00132H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
23	B00133H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
24	B00138H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
25	B00143H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
26	B00145H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
27	B00176H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
28	B00177H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
29	B00178H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
30	B00180H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
31	B00182H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
32	B00183H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
33	B00184H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
34	B00185H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
35	B00186H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
36	B00187H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
37	B00188H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
38	B00189H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
39	B00190H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
40	B00191H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
41	B00192H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
42	B00193H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
43	B00194H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
44	B00195H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
45	B00196H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
46	B00197H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
47	B00198H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
48	B00199H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
49	B00200H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
50	B00226H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070

51	B00228H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
52	B00229H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
53	B00230H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
54	B00231H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
55	B00232H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
56	B00236H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
57	B00239H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
58	B00240H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
59	B00241H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
60	B00242H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
61	B00243H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
62	B00244H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
63	B00245H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
64	B00246H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
65	B00248H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
66	B00250H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
67	B00279H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
68	B00282H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
69	B00283H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
70	B00285H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
71	B00290H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
72	B00294H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
73	B00297H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030

END FORM
73 STRAINS

Strains isolated from water at 4C capable of utilizing any one of the following amino acids: alanine, Beta-alanine, Gamma-aminobutyric, arginine, asparagine, aspartic betaine, cysteine, cystine, glutamic, glycine, hippurate, histidine, leucine, iso-leucine, lysine, methionine, ornithine, phenylalanine, proline, sarcosine, serine, threonine, tryptophan, tyrosine, valine.

1	B00053L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
2	B00057L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
3	B00058L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
4	B00059L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
5	B00063L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
6	B00067L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
7	B00071L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
8	B00072L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
9	B00073L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
10	B00074L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
11	B00075L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
12	B00101L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
13	B00103L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
14	B00106L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
15	B00108L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
16	B00109L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
17	B00111L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
18	B00114L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
19	B00116L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
20	B00117L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
21	B00118L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
22	B00119L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
23	B00120L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
24	B00121L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
25	B00122L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
26	B00123L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
27	B00151L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
28	B00152L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
29	B00153L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
30	B00154L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
31	B00156L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
32	B00157L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
33	B00164L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
34	B00166L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
35	B00167L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
36	B00169L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
37	B00170L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
38	B00171L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
39	B00174L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
40	B00201L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070

41	B00202L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
42	B00203L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
43	B00205L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
44	B00212L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
45	B00213L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
46	B00216L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
47	B00221L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
48	B00222L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
49	B00223L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
50	B00225L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
51	B00281L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
52	B00282L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
53	B00283L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
54	B00291L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002
55	B00294L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002
56	B00295L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002

END FORM
56 STRAINS

Strains isolated from sediment at 4C capable of utilizing any of the following amino acids: asparagine, aspartic, gamma-aminobutyric, cysteine, cystine, glutamic, clycine, histidine, leucine, iso-leucine, lysine, methionine, ornithine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine, valine.

1	B00026L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
2	B00027L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
3	B00029L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
4	B00031L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
5	B00035L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
6	B00042L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
7	B00077L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
8	B00078L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
9	B00084L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
10	B00087L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
11	B00089L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
12	B00091L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
13	B00092L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
14	B00093L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
15	B00094L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
16	B00095L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
17	B00097L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
18	B00098L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
19	B00099L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
20	B00100L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
21	B00126L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
22	B00127L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
23	B00128L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
24	B00130L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
25	B00131L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
26	B00133L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
27	B00144L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
28	B00145L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
29	B00146L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
30	B00149L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
31	B00150L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
32	B00178L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
33	B00184L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
34	B00185L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
35	B00186L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
36	B00187L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
37	B00189L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
38	B00190L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
39	B00191L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
40	B00192L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
41	B00193L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
42	B00194L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
43	B00195L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
44	B00198L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
45	B00199L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
46	B00226L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
47	B00227L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
48	B00230L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
49	B00232L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
50	B00233L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070

51	B00234L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
52	B00235L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
53	B00237L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
54	B00238L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
55	B00239L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
56	B00240L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
57	B00241L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
58	B00242L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
59	B00243L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
60	B00244L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
61	B00245L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
62	B00246L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
63	B00247L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
64	B00250L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
65	B00251L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
66	B00252L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
67	B00257L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
68	B00259L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
69	B00261L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
70	B00263L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
71	B00265L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
72	B00267L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
73	B00268L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
74	B00270L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
75	B00271L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
76	B00272L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
77	B00273L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
78	B00274L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
79	B00286L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
80	B00287L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
81	B00289L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
82	B00290L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
83	B00296L	BEAUFORT	SAMPLE	32	SEDIMENT	04C	STATION002
84	B00299L	BEAUFORT	SAMPLE	32	SEDIMENT	04C	STATION002

END FORM
84 STRAINS

Strains isolated from water at 20C capable of utilizing any one of the following amino acids: alanine, Beta-alanine, Gamma-aminobutyric, arginine, asparagine, aspartic,betaine, cysteine, cystine, glutamic, glycine, hippurate, histidine, leucine, iso-leucine, lysine, methionine, ornithine, phenylalanine, proline, sarcosine, serine, threonine, tryptophan, tyrosine, valine.

1	B00001H	BEAUFORT SAMPLE 03 WATER 20C STATION010
2	B00002H	BEAUFORT SAMPLE 03 WATER 20C STATION010
3	B00003H	BEAUFORT SAMPLE 03 WATER 20C STATION010
4	B00004H	BEAUFORT SAMPLE 03 WATER 20C STATION010
5	B00005H	BEAUFORT SAMPLE 03 WATER 20C STATION010
6	B00006H	BEAUFORT SAMPLE 03 WATER 20C STATION010
7	B00007H	BEAUFORT SAMPLE 03 WATER 20C STATION010
8	B00008H	BEAUFORT SAMPLE 03 WATER 20C STATION010
9	B00009H	BEAUFORT SAMPLE 03 WATER 20C STATION010
10	B00010H	BEAUFORT SAMPLE 03 WATER 20C STATION010
11	B00013H	BEAUFORT SAMPLE 03 WATER 20C STATION010
12	B00014H	BEAUFORT SAMPLE 03 WATER 20C STATION010
13	B00016H	BEAUFORT SAMPLE 03 WATER 20C STATION010
14	B00017H	BEAUFORT SAMPLE 03 WATER 20C STATION010
15	B00018H	BEAUFORT SAMPLE 03 WATER 20C STATION010
16	B00020H	BEAUFORT SAMPLE 03 WATER 20C STATION010
17	B00021H	BEAUFORT SAMPLE 03 WATER 20C STATION010
18	B00022H	BEAUFORT SAMPLE 03 WATER 20C STATION010
19	B00023H	BEAUFORT SAMPLE 03 WATER 20C STATION010
20	B00024H	BEAUFORT SAMPLE 03 WATER 20C STATION010
21	B00051H	BEAUFORT SAMPLE 20 WATER 20C STATION020
22	B00052H	BEAUFORT SAMPLE 20 WATER 20C STATION020
23	B00053H	BEAUFORT SAMPLE 20 WATER 20C STATION020
24	B00054H	BEAUFORT SAMPLE 20 WATER 20C STATION020
25	B00055H	BEAUFORT SAMPLE 20 WATER 20C STATION020
26	B00058H	BEAUFORT SAMPLE 20 WATER 20C STATION002
27	B00059H	BEAUFORT SAMPLE 20 WATER 20C STATION002
28	B00060H	BEAUFORT SAMPLE 20 WATER 20C STATION002
29	B00061H	BEAUFORT SAMPLE 20 WATER 20C STATION002
30	B00063H	BEAUFORT SAMPLE 20 WATER 20C STATION002
31	B00064H	BEAUFORT SAMPLE 20 WATER 20C STATION002
32	B00065H	BEAUFORT SAMPLE 20 WATER 20C STATION002
33	B00066H	BEAUFORT SAMPLE 20 WATER 20C STATION002
34	B00101H	BEAUFORT SAMPLE 27 WATER 20C STATION071
35	B00102H	BEAUFORT SAMPLE 27 WATER 20C STATION071
36	B00103H	BEAUFORT SAMPLE 27 WATER 20C STATION071
37	B00104H	BEAUFORT SAMPLE 27 WATER 20C STATION071
38	B00106H	BEAUFORT SAMPLE 27 WATER 20C STATION071
39	B00109H	BEAUFORT SAMPLE 27 WATER 20C STATION071
40	B00110H	BEAUFORT SAMPLE 27 WATER 20C STATION071
41	B00111H	BEAUFORT SAMPLE 27 WATER 20C STATION071
42	B00112H	BEAUFORT SAMPLE 27 WATER 20C STATION071
43	B00113H	BEAUFORT SAMPLE 27 WATER 20C STATION071
44	B00114H	BEAUFORT SAMPLE 27 WATER 20C STATION071
45	B00115H	BEAUFORT SAMPLE 27 WATER 20C STATION071
46	B00116H	BEAUFORT SAMPLE 27 WATER 20C STATION071
47	B00117H	BEAUFORT SAMPLE 27 WATER 20C STATION071
48	B00118H	BEAUFORT SAMPLE 27 WATER 20C STATION071
49	B00119H	BEAUFORT SAMPLE 27 WATER 20C STATION071
50	B00120H	BEAUFORT SAMPLE 27 WATER 20C STATION071

51	B00121H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
52	B00122H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
53	B00123H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
54	B00124H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
55	B00151H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
56	B00152H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
57	B00153H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
58	B00154H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
59	B00155H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
60	B00156H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
61	B00158H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
62	B00159H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
63	B00160H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
64	B00161H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
65	B00162H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
66	B00163H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
67	B00164H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
68	B00166H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
69	B00168H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
70	B00169H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
71	B00201H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
72	B00202H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
73	B00204H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
74	B00205H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
75	B00206H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
76	B00207H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
77	B00208H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
78	B00210H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
79	B00211H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
80	B00212H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
81	B00213H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
82	B00216H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
83	B00217H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
84	B00219H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
85	B00221H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
86	B00222H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
87	B00223H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
88	B00251H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
89	B00252H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
90	B00254H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
91	B00255H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
92	B00256H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
93	B00257H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
94	B00258H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
95	B00259H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
96	B00260H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
97	B00261H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
98	B00262H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
99	B00263H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
100	B00264H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
101	B00265H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
102	B00266H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
103	B00268H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
104	B00269H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
105	B00270H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
106	B00271H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
107	B00273H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
108	B00275H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030

END FORM
108 STRAINS

Strains isolated from sediment at 20C capable of utilizing any of the following amino acids: alanine, Beta-alanine, Gamma-aminobutyric, arginine, asparagine, aspartic, betaine, cysteine, cystine, glutamic, glycine, hippurate, histidine, leucine, iso-leucine, lysine, methionine, ornithine, phenylalanine, proline, sarcosine, serine, threonine, tryptophan, tyrosine, valine.

1	B00026H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
2	B00027H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
3	B00028H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
4	B00030H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
5	B00031H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
6	B00032H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
7	B00036H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
8	B00038H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
9	B00044H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
10	B00045H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
11	B00047H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
12	B00048H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
13	B00085H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
14	B00086H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
15	B00097H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
16	B00098H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
17	B00130H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
18	B00131H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
19	B00135H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
20	B00143H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
21	B00145H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
22	B00147H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
23	B00178H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
24	B00180H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
25	B00181H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
26	B00183H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
27	B00184H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
28	B00186H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
29	B00187H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
30	B00188H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
31	B00189H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
32	B00190H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
33	B00192H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
34	B00193H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
35	B00194H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
36	B00198H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
37	B00199H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
38	B00200H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
39	B00231H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
40	B00232H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
41	B00233H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
42	B00236H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
43	B00239H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
44	B00240H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
45	B00241H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
46	B00242H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
47	B00243H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
48	B00244H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
49	B00245H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
50	B00246H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070

51	B00248H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
52	B00249H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
53	B00250H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
54	B00276H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
55	B00281H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
56	B00282H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
57	B00283H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
58	B00286H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
59	B00295H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
60	B00297H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
61	B00300H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030

END FORM
61 STRAINS

Strains isolated from water at 4C capable of utilizing any one of the following alcohols: D-arabitol, 1-butanol, 2-propanol, 1-propanol, D-mannitol, D-sorbitol, Meso-inositol, 1,2-propanediol, ethanol, glycerol, dulcitol.

1	B00005L	BEAUFORT	SAMPLE	03	WATER 04C	STATION010
2	B00006L	BEAUFORT	SAMPLE	03	WATER 04C	STATION010
3	B00054L	BEAUFORT	SAMPLE	20	WATER 04C	STATION002
4	B00058L	BEAUFORT	SAMPLE	20	WATER 04C	STATION002
5	B00059L	BEAUFORT	SAMPLE	20	WATER 04C	STATION002
6	B00060L	BEAUFORT	SAMPLE	20	WATER 04C	STATION002
7	B00067L	BEAUFORT	SAMPLE	20	WATER 04C	STATION002
8	B00071L	BEAUFORT	SAMPLE	20	WATER 04C	STATION002
9	B00073L	BEAUFORT	SAMPLE	20	WATER 04C	STATION002
10	B00074L	BEAUFORT	SAMPLE	20	WATER 04C	STATION002
11	B00075L	BEAUFORT	SAMPLE	20	WATER 04C	STATION002
12	B00109L	BEAUFORT	SAMPLE	27	WATER 04C	STATION071
13	B00114L	BEAUFORT	SAMPLE	27	WATER 04C	STATION071
14	B00117L	BEAUFORT	SAMPLE	27	WATER 04C	STATION071
15	B00121L	BEAUFORT	SAMPLE	27	WATER 04C	STATION071
16	B00152L	BEAUFORT	SAMPLE	24	WATER 04C	STATION055
17	B00153L	BEAUFORT	SAMPLE	24	WATER 04C	STATION055
18	B00156L	BEAUFORT	SAMPLE	24	WATER 04C	STATION055
19	B00160L	BEAUFORT	SAMPLE	24	WATER 04C	STATION055
20	B00164L	BEAUFORT	SAMPLE	24	WATER 04C	STATION055
21	B00165L	BEAUFORT	SAMPLE	24	WATER 04C	STATION055
22	B00166L	BEAUFORT	SAMPLE	24	WATER 04C	STATION055
23	B00167L	BEAUFORT	SAMPLE	24	WATER 04C	STATION055
24	B00169L	BEAUFORT	SAMPLE	24	WATER 04C	STATION055
25	B00174L	BEAUFORT	SAMPLE	24	WATER 04C	STATION055
26	B00201L	BEAUFORT	SAMPLE	26	WATER 04C	STATION070
27	B00202L	BEAUFORT	SAMPLE	26	WATER 04C	STATION070
28	B00212L	BEAUFORT	SAMPLE	26	WATER 04C	STATION070
29	B00216L	BEAUFORT	SAMPLE	26	WATER 04C	STATION070
30	B00221L	BEAUFORT	SAMPLE	26	WATER 04C	STATION070
31	B00225L	BEAUFORT	SAMPLE	26	WATER 04C	STATION070
32	B00283L	BEAUFORT	SAMPLE	19	WATER 04C	STATION001
33	B00294L	BEAUFORT	SAMPLE	36	WATER 04C	STATION002
34	B00295L	BEAUFORT	SAMPLE	36	WATER 04C	STATION002

END FORM 100192

34 STRAINS

[illegible] MAND

Strains isolated from sediment at 4C capable of utilizing any one of the following alcohols: D-arabitol, 1-butanol, 2-propanol, 1-propanol, D-mannitol, D-sorbitol, Meso-inositol, 1,2-propanediol, ethanol, glycerol, dulcitol.

1	B00026L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
2	B00027L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
3	B00029L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
4	B00030L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
5	B00031L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
6	B00032L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
7	B00035L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
8	B00038L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
9	B00039L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
10	B00044L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
11	B00048L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
12	B00049L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
13	B00076L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
14	B00077L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
15	B00078L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
16	B00080L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
17	B00084L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
18	B00087L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
19	B00089L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
20	B00091L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
21	B00092L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
22	B00094L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
23	B00095L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
24	B00096L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
25	B00097L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
26	B00098L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
27	B00099L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
28	B00100L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
29	B00126L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
30	B00127L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
31	B00129L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
32	B00131L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
33	B00133L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
34	B00135L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
35	B00137L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
36	B00144L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
37	B00145L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
38	B00146L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
39	B00148L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
40	B00181L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055

41	B00184L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
42	B00185L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
43	B00186L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
44	B00226L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
45	B00227L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
46	B00230L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
47	B00232L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
48	B00237L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
49	B00243L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
50	B00244L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
51	B00247L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
52	B00251L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
53	B00266L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
54	B00267L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
55	B00270L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
56	B00289L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
57	B00290L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
58	B00299L	BEAUFORT	SAMPLE	32	SEDIMENT	04C	STATION002

END FORM
58 STRAINS

Strains isolated from water at 20C capable of utilizing any one of the following alcohols: D-arabitol, 1-butanol, 2-propanol, 1-propanol, D-mannitol, D-sorbitol, Meso-inositol, 1,2-propanediol, ethanol, glycerol, dulcitol.

1	B00001H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
2	B00002H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
3	B00003H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
4	B00005H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
5	B00006H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
6	B00007H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
7	B00008H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
8	B00009H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
9	B00012H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
10	B00013H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
11	B00014H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
12	B00016H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
13	B00017H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
14	B00018H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
15	B00020H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
16	B00021H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
17	B00022H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
18	B00024H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
19	B00051H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
20	B00052H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
21	B00053H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
22	B00054H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
23	B00055H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
24	B00058H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
25	B00059H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
26	B00060H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
27	B00061H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
28	B00063H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
29	B00064H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
30	B00065H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
31	B00066H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
32	B00067H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
33	B00068H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
34	B00069H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
35	B00070H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
36	B00071H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
37	B00072H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
38	B00073H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
39	B00101H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
40	B00102H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
41	B00103H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
42	B00104H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
43	B00106H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
44	B00109H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
45	B00110H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
46	B00112H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
47	B00113H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
48	B00114H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
49	B00115H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
50	B00116H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071

51	B00118H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
52	B00119H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
53	B00120H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
54	B00121H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
55	B00122H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
56	B00123H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
57	B00151H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
58	B00152H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
59	B00153H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
60	B00154H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
61	B00155H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
62	B00156H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
63	B00158H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
64	B00160H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
65	B00161H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
66	B00163H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
67	B00164H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
68	B00165H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
69	B00166H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
70	B00168H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
71	B00169H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
72	B00201H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
73	B00202H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
74	B00204H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
75	B00205H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
76	B00206H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
77	B00207H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
78	B00208H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
79	B00210H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
80	B00211H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
81	B00212H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
82	B00213H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
83	B00216H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
84	B00217H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
85	B00219H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
86	B00221H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
87	B00222H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
88	B00251H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
89	B00252H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
90	B00254H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
91	B00255H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
92	B00256H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
93	B00257H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
94	B00258H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
95	B00260H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
96	B00261H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
97	B00262H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
98	B00263H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
99	B00264H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
100	B00265H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
101	B00266H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
102	B00268H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
103	B00269H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
104	B00270H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
105	B00271H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
106	B00272H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
107	B00273H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
108	B00275H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030

END FORM
108 STRAINS

Strains isolated from sediment at 20C capable of utilizing any one of the following alcohols: D-arabitol, 1-butanol, 2-propanol, 1-propanol, D-mannitol, D-sorbitol, Meso-inositol, 1,2-propanediol, ethanol, glycerol, dulcitol.

1	B00026H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
2	B00027H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
3	B00028H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
4	B00029H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
5	B00030H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
6	B00032H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
7	B00033H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
8	B00036H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
9	B00038H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
10	B00039H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
11	B00044H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
12	B00045H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
13	B00048H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
14	B00085H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
15	B00086H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
16	B00130H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
17	B00131H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
18	B00132H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
19	B00136H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
20	B00139H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
21	B00140H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
22	B00143H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
23	B00145H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
24	B00146H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
25	B00178H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
26	B00180H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
27	B00182H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
28	B00183H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
29	B00184H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
30	B00187H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
31	B00188H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
32	B00189H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
33	B00190H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
34	B00191H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
35	B00193H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
36	B00196H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
37	B00198H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
38	B00200H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
39	B00230H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
40	B00232H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
41	B00234H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
42	B00239H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
43	B00240H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
44	B00241H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
45	B00242H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
46	B00243H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
47	B00244H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
48	B00246H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
49	B00250H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
50	B00283H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
51	B00297H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030

END FORM
51 STRAINS

Strains isolated from sediment at 4C capable of utilizing phenol.

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  1  B00299L       BEAUFORT SAMPLE 32 SEDIMENT 04C STATION002
END FORM
      1 STRAINS
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Strains isolated from water or sediment at 20C capable of utilizing phenol.

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1   B00007H      BEAUFORT SAMPLE 03 WATER 20C STATION010

END FORM
     1 STRAINS
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Strains isolated from water at 4C capable of utilizing any one of the following carboxylic acids: succinic, fumaric, malonic, a-ketuglutaric, citric acids.

1	B00053L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
2	B00058L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
3	B00059L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
4	B00060L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
5	B00067L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
6	B00069L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
7	B00071L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
8	B00072L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
9	B00073L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
10	B00074L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
11	B00075L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
12	B00101L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
13	B00103L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
14	B00106L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
15	B00108L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
16	B00109L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
17	B00114L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
18	B00116L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
19	B00117L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
20	B00119L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
21	B00120L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
22	B00122L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
23	B00152L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
24	B00153L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
25	B00154L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
26	B00156L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
27	B00164L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
28	B00165L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
29	B00167L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
30	B00169L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
31	B00174L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
32	B00201L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
33	B00202L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
34	B00212L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
35	B00216L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
36	B00221L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
37	B00225L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
38	B00278L	BEAUFORT	SAMPLE	11	WATER	04C	STATION030
39	B00283L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
40	B00294L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002
41	B00295L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002

END FORM
41 STRAINS

Strains isolated from sediment at 4C capable of utilizing any of the following carboxylic acids: succinic, fumaric, malonic, a-ketoglutaric, citric acids.

1	B00026L	BEAUFORT	SAMPLE 03	SEDIMENT	04C	STATION010
2	B00027L	BEAUFORT	SAMPLE 03	SEDIMENT	04C	STATION010
3	B00029L	BEAUFORT	SAMPLE 03	SEDIMENT	04C	STATION010
4	B00031L	BEAUFORT	SAMPLE 03	SEDIMENT	04C	STATION010
5	B00032L	BEAUFORT	SAMPLE 03	SEDIMENT	04C	STATION010
6	B00035L	BEAUFORT	SAMPLE 03	SEDIMENT	04C	STATION010
7	B00044L	BEAUFORT	SAMPLE 03	SEDIMENT	04C	STATION010
8	B00047L	BEAUFORT	SAMPLE 03	SEDIMENT	04C	STATION010
9	B00049L	BEAUFORT	SAMPLE 03	SEDIMENT	04C	STATION010
10	B00050L	BEAUFORT	SAMPLE 03	SEDIMENT	04C	STATION010
11	B00076L	BEAUFORT	SAMPLE 16	SEDIMENT	04C	STATION002
12	B00077L	BEAUFORT	SAMPLE 16	SEDIMENT	04C	STATION002
13	B00078L	BEAUFORT	SAMPLE 16	SEDIMENT	04C	STATION002
14	B00084L	BEAUFORT	SAMPLE 16	SEDIMENT	04C	STATION002
15	B00087L	BEAUFORT	SAMPLE 16	SEDIMENT	04C	STATION002
16	B00089L	BEAUFORT	SAMPLE 16	SEDIMENT	04C	STATION002
17	B00091L	BEAUFORT	SAMPLE 16	SEDIMENT	04C	STATION002
18	B00092L	BEAUFORT	SAMPLE 16	SEDIMENT	04C	STATION002
19	B00093L	BEAUFORT	SAMPLE 16	SEDIMENT	04C	STATION002
20	B00094L	BEAUFORT	SAMPLE 16	SEDIMENT	04C	STATION002
21	B00095L	BEAUFORT	SAMPLE 16	SEDIMENT	04C	STATION002
22	B00096L	BEAUFORT	SAMPLE 16	SEDIMENT	04C	STATION002
23	B00097L	BEAUFORT	SAMPLE 16	SEDIMENT	04C	STATION002
24	B00098L	BEAUFORT	SAMPLE 16	SEDIMENT	04C	STATION002
25	B00099L	BEAUFORT	SAMPLE 16	SEDIMENT	04C	STATION002
26	B00100L	BEAUFORT	SAMPLE 16	SEDIMENT	04C	STATION002
27	B00126L	BEAUFORT	SAMPLE 22	SEDIMENT	04C	STATION071
28	B00127L	BEAUFORT	SAMPLE 22	SEDIMENT	04C	STATION071
29	B00129L	BEAUFORT	SAMPLE 22	SEDIMENT	04C	STATION071
30	B00130L	BEAUFORT	SAMPLE 22	SEDIMENT	04C	STATION071
31	B00131L	BEAUFORT	SAMPLE 22	SEDIMENT	04C	STATION071
32	B00132L	BEAUFORT	SAMPLE 22	SEDIMENT	04C	STATION071
33	B00133L	BEAUFORT	SAMPLE 22	SEDIMENT	04C	STATION071
34	B00134L	BEAUFORT	SAMPLE 22	SEDIMENT	04C	STATION071
35	B00135L	BEAUFORT	SAMPLE 22	SEDIMENT	04C	STATION071
36	B00137L	BEAUFORT	SAMPLE 22	SEDIMENT	04C	STATION071
37	B00141L	BEAUFORT	SAMPLE 22	SEDIMENT	04C	STATION071
38	B00144L	BEAUFORT	SAMPLE 22	SEDIMENT	04C	STATION071
39	B00145L	BEAUFORT	SAMPLE 22	SEDIMENT	04C	STATION071
40	B00146L	BEAUFORT	SAMPLE 22	SEDIMENT	04C	STATION071
41	B00148L	BEAUFORT	SAMPLE 22	SEDIMENT	04C	STATION071
42	B00181L	BEAUFORT	SAMPLE 20	SEDIMENT	04C	STATION055
43	B00184L	BEAUFORT	SAMPLE 20	SEDIMENT	04C	STATION055
44	B00185L	BEAUFORT	SAMPLE 20	SEDIMENT	04C	STATION055
45	B00186L	BEAUFORT	SAMPLE 20	SEDIMENT	04C	STATION055
46	B00187L	BEAUFORT	SAMPLE 20	SEDIMENT	04C	STATION055
47	B00189L	BEAUFORT	SAMPLE 20	SEDIMENT	04C	STATION055
48	B00191L	BEAUFORT	SAMPLE 20	SEDIMENT	04C	STATION055
49	B00193L	BEAUFORT	SAMPLE 20	SEDIMENT	04C	STATION055
50	B00197L	BEAUFORT	SAMPLE 20	SEDIMENT	04C	STATION055

51	B00226L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
52	B00227L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
53	B00230L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
54	B00232L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
55	B00234L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
56	B00235L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
57	B00236L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
58	B00237L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
59	B00241L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
60	B00243L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
61	B00247L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
62	B00251L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
63	B00252L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
64	B00253L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
65	B00257L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
66	B00258L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
67	B00261L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
68	B00265L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
69	B00267L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
70	B00270L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
71	B00271L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
72	B00273L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
73	B00274L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
74	B00275L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
75	B00289L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
76	B00299L	BEAUFORT	SAMPLE	32	SEDIMENT	04C	STATION002

END FORM
76 STRAINS

Strains isolated from water at 20C capable of utilizing any one of the following carboxylic acids: succinic, fumaric, malonic, a-ketuglutaric, citric acids.

1	B00001H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
2	B00002H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
3	B00005H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
4	B00006H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
5	B00007H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
6	B00013H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
7	B00014H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
8	B00016H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
9	B00017H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
10	B00018H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
11	B00020H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
12	B00023H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
13	B00024H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
14	B00051H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
15	B00052H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
16	B00053H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
17	B00054H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
18	B00055H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
19	B00057H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
20	B00058H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
21	B00059H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
22	B00060H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
23	B00061H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
24	B00064H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
25	B00065H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
26	B00066H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
27	B00067H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
28	B00068H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
29	B00069H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
30	B00070H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
31	B00071H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
32	B00072H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
33	B00073H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
34	B00075H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
35	B00101H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
36	B00102H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
37	B00103H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
38	B00104H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
39	B00106H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
40	B00109H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
41	B00110H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
42	B00111H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
43	B00112H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
44	B00113H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
45	B00114H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
46	B00115H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
47	B00116H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
48	B00117H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
49	B00118H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
50	B00119H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071

51	B00120H	BEAUFORT SAMPLE 27 WATER 20C STATION071
52	B00121H	BEAUFORT SAMPLE 27 WATER 20C STATION071
53	B00122H	BEAUFORT SAMPLE 27 WATER 20C STATION071
54	B00123H	BEAUFORT SAMPLE 27 WATER 20C STATION071
55	B00151H	BEAUFORT SAMPLE 24 WATER 20C STATION055
56	B00152H	BEAUFORT SAMPLE 24 WATER 20C STATION055
57	B00153H	BEAUFORT SAMPLE 24 WATER 20C STATION055
58	B00154H	BEAUFORT SAMPLE 24 WATER 20C STATION055
59	B00155H	BEAUFORT SAMPLE 24 WATER 20C STATION055
60	B00156H	BEAUFORT SAMPLE 24 WATER 20C STATION055
61	B00157H	BEAUFORT SAMPLE 24 WATER 20C STATION055
62	B00158H	BEAUFORT SAMPLE 24 WATER 20C STATION055
63	B00160H	BEAUFORT SAMPLE 24 WATER 20C STATION055
64	B00161H	BEAUFORT SAMPLE 24 WATER 20C STATION055
65	B00162H	BEAUFORT SAMPLE 24 WATER 20C STATION055
66	B00163H	BEAUFORT SAMPLE 24 WATER 20C STATION055
67	B00164H	BEAUFORT SAMPLE 24 WATER 20C STATION055
68	B00165H	BEAUFORT SAMPLE 24 WATER 20C STATION055
69	B00166H	BEAUFORT SAMPLE 24 WATER 20C STATION055
70	B00168H	BEAUFORT SAMPLE 24 WATER 20C STATION055
71	B00169H	BEAUFORT SAMPLE 24 WATER 20C STATION055
72	B00201H	BEAUFORT SAMPLE 26 WATER 20C STATION070
73	B00202H	BEAUFORT SAMPLE 26 WATER 20C STATION070
74	B00204H	BEAUFORT SAMPLE 26 WATER 20C STATION070
75	B00205H	BEAUFORT SAMPLE 26 WATER 20C STATION070
76	B00206H	BEAUFORT SAMPLE 26 WATER 20C STATION070
77	B00207H	BEAUFORT SAMPLE 26 WATER 20C STATION070
78	B00208H	BEAUFORT SAMPLE 26 WATER 20C STATION070
79	B00210H	BEAUFORT SAMPLE 26 WATER 20C STATION070
80	B00211H	BEAUFORT SAMPLE 26 WATER 20C STATION070
81	B00212H	BEAUFORT SAMPLE 26 WATER 20C STATION070
82	B00213H	BEAUFORT SAMPLE 26 WATER 20C STATION070
83	B00216H	BEAUFORT SAMPLE 26 WATER 20C STATION070
84	B00217H	BEAUFORT SAMPLE 26 WATER 20C STATION070
85	B00219H	BEAUFORT SAMPLE 26 WATER 20C STATION070
86	B00221H	BEAUFORT SAMPLE 26 WATER 20C STATION070
87	B00222H	BEAUFORT SAMPLE 26 WATER 20C STATION070
88	B00251H	BEAUFORT SAMPLE 11 WATER 20C STATION030
89	B00252H	BEAUFORT SAMPLE 11 WATER 20C STATION030
90	B00254H	BEAUFORT SAMPLE 11 WATER 20C STATION030
91	B00255H	BEAUFORT SAMPLE 11 WATER 20C STATION030
92	B00256H	BEAUFORT SAMPLE 11 WATER 20C STATION030
93	B00257H	BEAUFORT SAMPLE 11 WATER 20C STATION030
94	B00258H	BEAUFORT SAMPLE 11 WATER 20C STATION030
95	B00260H	BEAUFORT SAMPLE 11 WATER 20C STATION030
96	B00261H	BEAUFORT SAMPLE 11 WATER 20C STATION030
97	B00262H	BEAUFORT SAMPLE 11 WATER 20C STATION030
98	B00263H	BEAUFORT SAMPLE 11 WATER 20C STATION030
99	B00264H	BEAUFORT SAMPLE 11 WATER 20C STATION030
100	B00265H	BEAUFORT SAMPLE 11 WATER 20C STATION030
101	B00266H	BEAUFORT SAMPLE 11 WATER 20C STATION030
102	B00268H	BEAUFORT SAMPLE 11 WATER 20C STATION030
103	B00269H	BEAUFORT SAMPLE 11 WATER 20C STATION030
104	B00270H	BEAUFORT SAMPLE 11 WATER 20C STATION030
105	B00271H	BEAUFORT SAMPLE 11 WATER 20C STATION030
106	B00272H	BEAUFORT SAMPLE 11 WATER 20C STATION030
107	B00273H	BEAUFORT SAMPLE 11 WATER 20C STATION030
108	B00274H	BEAUFORT SAMPLE 11 WATER 20C STATION030
109	B00275H	BEAUFORT SAMPLE 11 WATER 20C STATION030

END FORM
109 STRAINS

Strains isolated from sediment at 20C capable of utilizing any one of the following carboxylic acids: succinic, fumaric, malonic, a-ketuglutaric, citric acids.

1	B00026H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
2	B00027H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
3	B00028H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
4	B00029H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
5	B00030H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
6	B00032H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
7	B00033H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
8	B00036H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
9	B00038H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
10	B00043H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
11	B00044H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
12	B00045H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
13	B00047H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
14	B00048H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
15	B00085H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
16	B00086H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
17	B00093H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
18	B00130H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
19	B00131H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
20	B00132H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
21	B00135H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
22	B00136H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
23	B00143H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
24	B00145H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
25	B00147H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
26	B00176H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
27	B00177H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
28	B00178H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
29	B00180H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
30	B00182H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
31	B00183H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
32	B00184H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
33	B00185H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
34	B00187H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
35	B00188H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
36	B00189H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
37	B00190H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
38	B00191H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
39	B00192H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
40	B00193H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
41	B00198H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
42	B00200H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
43	B00231H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
44	B00232H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
45	B00233H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
46	B00239H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
47	B00240H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
48	B00241H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
49	B00242H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
50	B00243H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070

51	B00244H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
52	B00245H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
53	B00246H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
54	B00248H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
55	B00250H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
56	B00276H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
57	B00282H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
58	B00283H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
59	B00286H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
60	B00295H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
61	B00297H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
62	B00300H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030

END FORM
62 STRAINS

Strains isolated from water at 4C capable of utilizing any of the following fatty acids: proprionic, butyric, caproic, caprylic, lauric, palmitic, stearic, oleic, valeric, isovaleric.

1	B00053L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
2	B00058L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
3	B00059L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
4	B00067L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
5	B00071L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
6	B00072L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
7	B00073L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
8	B00074L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
9	B00075L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
10	B00101L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
11	B00109L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
12	B00111L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
13	B00114L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
14	B00117L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
15	B00152L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
16	B00153L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
17	B00156L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
18	B00160L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
19	B00164L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
20	B00167L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
21	B00169L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
22	B00174L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
23	B00201L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
24	B00202L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
25	B00212L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
26	B00216L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
27	B00221L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
28	B00225L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
29	B00282L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
30	B00294L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002
31	B00295L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002

END FORM 100192

31 STRAINS

ENTER COMMAND

Strains isolated from sediment at 4C capable of utilizing any of the following fatty acids: proprionic, butyric, caproic, caprylic, lauric, palmitic, stearic, oleic, valeric, iso-valeric.

1	B00028L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
2	B00031L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
3	B00035L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
4	B00038L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
5	B00042L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
6	B00078L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
7	B00084L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
8	B00093L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
9	B00127L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
10	B00128L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
11	B00146L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
12	B00149L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
13	B00186L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
14	B00190L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
15	B00191L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
16	B00195L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
17	B00197L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
18	B00226L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
19	B00227L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
20	B00232L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
21	B00235L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
22	B00236L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
23	B00237L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
24	B00241L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
25	B00242L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
26	B00243L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
27	B00251L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
28	B00252L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
29	B00257L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
30	B00258L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
31	B00261L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
32	B00265L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
33	B00267L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
34	B00268L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
35	B00270L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
36	B00271L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
37	B00272L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
38	B00273L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
39	B00274L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
40	B00287L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
41	B00290L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
42	B00299L	BEAUFORT	SAMPLE	32	SEDIMENT	04C	STATION002

END FORM
42 STRAINS

Strains isolated from water at 20C capable of utilizing any of the following fatty acids: proprionic, butyric, caproic, caprylic, lauric, palmitic, stearic, oleic, valeric, isovaleric.

1	B00001H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
2	B00002H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
3	B00003H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
4	B00005H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
5	B00006H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
6	B00007H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
7	B00008H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
8	B00009H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
9	B00010H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
10	B00013H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
11	B00014H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
12	B00016H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
13	B00017H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
14	B00018H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
15	B00020H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
16	B00021H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
17	B00022H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
18	B00023H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
19	B00024H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
20	B00051H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
21	B00052H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
22	B00053H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
23	B00054H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
24	B00055H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
25	B00058H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
26	B00059H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
27	B00060H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
28	B00061H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
29	B00064H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
30	B00065H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
31	B00066H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
32	B00067H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
33	B00068H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
34	B00069H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
35	B00070H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
36	B00071H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
37	B00072H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
38	B00073H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
39	B00075H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
40	B00101H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
41	B00102H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
42	B00103H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
43	B00104H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
44	B00106H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
45	B00109H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
46	B00110H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
47	B00113H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
48	B00114H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
49	B00115H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
50	B00116H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071

51	B00118H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
52	B00119H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
53	B00120H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
54	B00121H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
55	B00123H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
56	B00151H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
57	B00152H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
58	B00153H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
59	B00154H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
60	B00155H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
61	B00156H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
62	B00158H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
63	B00160H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
64	B00161H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
65	B00162H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
66	B00163H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
67	B00164H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
68	B00166H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
69	B00168H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
70	B00169H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
71	B00202H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
72	B00203H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
73	B00204H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
74	B00205H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
75	B00206H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
76	B00207H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
77	B00208H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
78	B00210H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
79	B00211H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
80	B00212H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
81	B00213H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
82	B00216H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
83	B00217H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
84	B00219H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
85	B00221H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
86	B00222H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
87	B00251H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
88	B00252H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
89	B00254H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
90	B00255H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
91	B00256H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
92	B00257H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
93	B00258H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
94	B00260H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
95	B00261H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
96	B00262H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
97	B00263H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
98	B00264H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
99	B00265H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
100	B00266H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
101	B00268H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
102	B00269H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
103	B00270H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
104	B00271H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
105	B00272H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
106	B00273H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
107	B00275H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030

END FORM

107 STRAINS

Strains isolated from sediment at 20C capable of utilizing any of the following fatty acids: proprionic, butyric, caproic, caprylic, lauric, palmitic, stearic, oleic, valeric, isovaleric.

1	B00026H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
2	B00027H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
3	B00028H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
4	B00029H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
5	B00030H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
6	B00032H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
7	B00033H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
8	B00036H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
9	B00038H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
10	B00043H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
11	B00044H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
12	B00045H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
13	B00047H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
14	B00048H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
15	B00077H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
16	B00085H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
17	B00086H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
18	B00098H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
19	B00131H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
20	B00135H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
21	B00136H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
22	B00143H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
23	B00145H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
24	B00147H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
25	B00178H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
26	B00180H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
27	B00182H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
28	B00183H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
29	B00184H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
30	B00187H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
31	B00188H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
32	B00189H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
33	B00190H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
34	B00191H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
35	B00192H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
36	B00193H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
37	B00198H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
38	B00200H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
39	B00233H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
40	B00239H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070

41	B00240H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
42	B00241H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
43	B00243H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
44	B00244H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
45	B00248H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
46	B00249H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
47	B00250H	BEAUFORT SAMPLE 21 SEDIMENT 20C STATION070
48	B00276H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
49	B00279H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
50	B00282H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
51	B00283H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
52	B00285H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
53	B00286H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
54	B00295H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
55	B00297H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030
56	B00300H	BEAUFORT SAMPLE 09 SEDIMENT 20C STATION030

END FORM
56 STRAINS

Strains isolated from water at 4C capable of utilizing pyruvic acid.

1	B00009L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
2	B00012L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
3	B00053L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
4	B00057L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
5	B00058L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
6	B00059L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
7	B00067L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
8	B00071L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
9	B00073L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
10	B00074L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
11	B00075L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
12	B00109L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
13	B00112L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
14	B00114L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
15	B00117L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
16	B00151L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
17	B00152L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
18	B00153L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
19	B00156L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
20	B00164L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
21	B00166L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
22	B00167L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
23	B00174L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
24	B00201L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
25	B00202L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
26	B00212L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
27	B00216L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
28	B00221L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
29	B00222L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
30	B00223L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
31	B00225L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
32	B00278L	BEAUFORT	SAMPLE	11	WATER	04C	STATION030
33	B00282L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
34	B00283L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
35	B00294L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002
36	B00295L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002

END FORM
36 STRAINS

Strains isolated from sediment at 4C capable of utilizing pyruvic acid.

1	B00026L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
2	B00027L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
3	B00028L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
4	B00030L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
5	B00031L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
6	B00032L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
7	B00035L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
8	B00038L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
9	B00040L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
10	B00041L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
11	B00042L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
12	B00043L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
13	B00044L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
14	B00046L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
15	B00049L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
16	B00050L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
17	B00076L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
18	B00077L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
19	B00078L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
20	B00084L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
21	B00093L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
22	B00096L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
23	B00126L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
24	B00127L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
25	B00129L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
26	B00131L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
27	B00134L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
28	B00135L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
29	B00144L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
30	B00145L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
31	B00146L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
32	B00149L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
33	B00150L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
34	B00176L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
35	B00184L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
36	B00185L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
37	B00186L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
38	B00187L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
39	B00189L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
40	B00190L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
41	B00191L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
42	B00195L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
43	B00197L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
44	B00226L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
45	B00227L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
46	B00230L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
47	B00232L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
48	B00233L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
49	B00234L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
50	B00235L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070

51	B00236L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
52	B00237L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
53	B00241L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
54	B00242L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
55	B00243L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
56	B00247L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
57	B00251L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
58	B00252L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
59	B00253L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
60	B00257L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
61	B00258L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
62	B00260L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
63	B00261L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
64	B00263L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
65	B00265L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
66	B00267L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
67	B00268L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
68	B00270L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
69	B00271L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
70	B00272L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
71	B00273L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
72	B00274L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
73	B00275L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
74	B00287L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
75	B00290L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
76	B00297L	BEAUFORT	SAMPLE	32	SEDIMENT	04C	STATION002
77	B00299L	BEAUFORT	SAMPLE	32	SEDIMENT	04C	STATION002

END FORM

77 STRAINS

Strains isolated from water at 20C capable of utilizing pyruvic acid.

1	B00001H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
2	B00002H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
3	B00003H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
4	B00005H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
5	B00006H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
6	B00007H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
7	B00008H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
8	B00009H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
9	B00010H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
10	B00013H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
11	B00014H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
12	B00016H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
13	B00017H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
14	B00018H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
15	B00020H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
16	B00022H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
17	B00023H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
18	B00024H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
19	B00051H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
20	B00052H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
21	B00053H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
22	B00054H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
23	B00055H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
24	B00057H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
25	B00058H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
26	B00060H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
27	B00064H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
28	B00065H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
29	B00066H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
30	B00067H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
31	B00068H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
32	B00069H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
33	B00070H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
34	B00071H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
35	B00072H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
36	B00073H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
37	B00075H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
38	B00104H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
39	B00106H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
40	B00109H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
41	B00110H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
42	B00111H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
43	B00112H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
44	B00114H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
45	B00115H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
46	B00120H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
47	B00121H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
48	B00122H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
49	B00123H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
50	B00151H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055

51	B00152H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
52	B00154H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
53	B00156H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
54	B00158H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
55	B00160H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
56	B00161H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
57	B00162H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
58	B00163H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
59	B00164H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
60	B00166H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
61	B00168H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
62	B00169H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
63	B00201H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
64	B00202H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
65	B00203H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
66	B00204H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
67	B00205H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
68	B00208H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
69	B00210H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
70	B00211H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
71	B00212H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
72	B00213H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
73	B00216H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
74	B00217H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
75	B00219H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
76	B00221H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
77	B00222H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
78	B00251H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
79	B00252H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
80	B00254H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
81	B00255H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
82	B00256H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
83	B00257H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
84	B00258H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
85	B00260H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
86	B00261H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
87	B00262H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
88	B00263H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
89	B00264H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
90	B00265H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
91	B00266H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
92	B00269H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
93	B00270H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
94	B00271H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
95	B00272H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
96	B00273H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
97	B00275H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030

END FORM
97 STRAINS

Strains isolated from sediment at 20C capable of utilizing pyruvic acid.

1	B00026H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
2	B00027H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
3	B00028H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
4	B00029H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
5	B00030H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
6	B00032H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
7	B00033H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
8	B00036H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
9	B00038H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
10	B00043H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
11	B00044H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
12	B00045H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
13	B00047H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
14	B00048H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
15	B00085H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
16	B00086H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
17	B00131H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
18	B00132H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
19	B00135H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
20	B00136H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
21	B00141H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
22	B00143H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
23	B00145H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
24	B00147H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
25	B00178H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
26	B00180H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
27	B00182H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
28	B00183H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
29	B00184H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
30	B00185H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
31	B00187H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
32	B00188H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
33	B00189H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
34	B00190H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
35	B00192H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
36	B00193H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
37	B00198H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
38	B00200H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
39	B00231H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
40	B00232H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
41	B00233H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
42	B00239H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
43	B00240H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
44	B00241H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
45	B00242H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
46	B00243H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
47	B00248H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
48	B00249H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
49	B00276H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
50	B00282H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
51	B00283H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
52	B00286H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
53	B00295H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
54	B00297H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
55	B00300H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030

END FORM
55 STRAINS

Strains isolated from water at 4C capable of utilizing acetic acid.

1	B00058L	BEAUFORT SAMPLE 20 WATER 04C	STATION002
2	B00059L	BEAUFORT SAMPLE 20 WATER 04C	STATION002
3	B00073L	BEAUFORT SAMPLE 20 WATER 04C	STATION002
4	B00074L	BEAUFORT SAMPLE 20 WATER 04C	STATION002
5	B00075L	BEAUFORT SAMPLE 20 WATER 04C	STATION002
6	B00109L	BEAUFORT SAMPLE 27 WATER 04C	STATION071
7	B00114L	BEAUFORT SAMPLE 27 WATER 04C	STATION071
8	B00117L	BEAUFORT SAMPLE 27 WATER 04C	STATION071
9	B00152L	BEAUFORT SAMPLE 24 WATER 04C	STATION055
10	B00153L	BEAUFORT SAMPLE 24 WATER 04C	STATION055
11	B00156L	BEAUFORT SAMPLE 24 WATER 04C	STATION055
12	B00160L	BEAUFORT SAMPLE 24 WATER 04C	STATION055
13	B00164L	BEAUFORT SAMPLE 24 WATER 04C	STATION055
14	B00167L	BEAUFORT SAMPLE 24 WATER 04C	STATION055
15	B00169L	BEAUFORT SAMPLE 24 WATER 04C	STATION055
16	B00174L	BEAUFORT SAMPLE 24 WATER 04C	STATION055
17	B00201L	BEAUFORT SAMPLE 26 WATER 04C	STATION070
18	B00202L	BEAUFORT SAMPLE 26 WATER 04C	STATION070
19	B00212L	BEAUFORT SAMPLE 26 WATER 04C	STATION070
20	B00221L	BEAUFORT SAMPLE 26 WATER 04C	STATION070
21	B00225L	BEAUFORT SAMPLE 26 WATER 04C	STATION070
22	B00282L	BEAUFORT SAMPLE 19 WATER 04C	STATION001
23	B00294L	BEAUFORT SAMPLE 36 WATER 04C	STATION002
24	B00295L	BEAUFORT SAMPLE 36 WATER 04C	STATION002

END FORM
24 STRAINS

Strains isolated from sediment at 4C capable of utilizing acetic acid.

1	B00026L	BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010
2	B00027L	BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010
3	B00038L	BEAUFORT SAMPLE 03 SEDIMENT 04C STATION010
4	B00078L	BEAUFORT SAMPLE 16 SEDIMENT 04C STATION002
5	B00084L	BEAUFORT SAMPLE 16 SEDIMENT 04C STATION002
6	B00093L	BEAUFORT SAMPLE 16 SEDIMENT 04C STATION002
7	B00127L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
8	B00128L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
9	B00146L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
10	B00149L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
11	B00184L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
12	B00185L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
13	B00186L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
14	B00191L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
15	B00226L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
16	B00227L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
17	B00232L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
18	B00236L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
19	B00237L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
20	B00243L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
21	B00251L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
22	B00252L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
23	B00265L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
24	B00270L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
25	B00287L	BEAUFORT SAMPLE 15 SEDIMENT 04C STATION001
26	B00299L	BEAUFORT SAMPLE 32 SEDIMENT 04C STATION002

END FORM
26 STRAINS

Strains isolated from water at 20C capable of utilizing acetic acid.

1	B00001H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
2	B00002H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
3	B00005H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
4	B00006H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
5	B00007H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
6	B00008H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
7	B00013H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
8	B00014H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
9	B00016H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
10	B00017H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
11	B00018H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
12	B00020H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
13	B00022H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
14	B00023H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
15	B00024H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
16	B00051H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
17	B00052H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
18	B00053H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
19	B00054H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
20	B00055H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
21	B00058H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
22	B00059H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
23	B00060H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
24	B00061H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
25	B00064H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
26	B00065H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
27	B00066H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
28	B00067H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
29	B00068H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
30	B00069H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
31	B00070H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
32	B00071H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
33	B00072H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
34	B00073H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
35	B00101H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
36	B00102H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
37	B00103H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
38	B00104H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
39	B00106H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
40	B00109H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
41	B00110H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
42	B00111H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
43	B00113H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
44	B00114H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
45	B00115H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
46	B00116H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
47	B00118H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
48	B00119H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
49	B00120H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
50	B00121H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071

51	B00123H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
52	B00151H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
53	B00152H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
54	B00153H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
55	B00154H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
56	B00155H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
57	B00156H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
58	B00158H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
59	B00160H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
60	B00161H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
61	B00163H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
62	B00164H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
63	B00166H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
64	B00168H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
65	B00169H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
66	B00202H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
67	B00204H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
68	B00205H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
69	B00206H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
70	B00207H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
71	B00208H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
72	B00210H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
73	B00211H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
74	B00212H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
75	B00213H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
76	B00216H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
77	B00217H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
78	B00219H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
79	B00221H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
80	B00222H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
81	B00251H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
82	B00252H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
83	B00254H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
84	B00255H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
85	B00256H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
86	B00258H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
87	B00260H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
88	B00261H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
89	B00262H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
90	B00263H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
91	B00264H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
92	B00265H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
93	B00266H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
94	B00268H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
95	B00269H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
96	B00270H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
97	B00271H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
98	B00273H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
99	B00275H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030

END FORM
99 STRAINS

Strains isolated from sediment at 20C capable of utilizing acetic acid.

1	B00026H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
2	B00028H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
3	B00029H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
4	B00030H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
5	B00032H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
6	B00033H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
7	B00036H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
8	B00038H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
9	B00042H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
10	B00043H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
11	B00044H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
12	B00045H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
13	B00047H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
14	B00048H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
15	B00085H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
16	B00086H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
17	B00130H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
18	B00135H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
19	B00143H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
20	B00145H	BEA◊FORT	SAMPLE	22	SEDIMENT	20C	STATION071
21	B00178H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
22	B00180H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
23	B00182H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
24	B00184H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
25	B00187H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
26	B00188H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
27	B00189H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
28	B00190H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
29	B00192H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
30	B00193H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
31	B00198H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
32	B00200H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
33	B00233H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
34	B00240H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
35	B00241H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
36	B00243H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
37	B00244H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
38	B00250H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
39	B00276H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
40	B00283H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030

STOP?(Y/N):N

END FORM
40 STRAINS

Strains isolated from water at 20C capable of utilizing benzoic acid.

1	B00002H	BEAUFORT SAMPLE 03 WATER 20C STATION010
2	B00007H	BEAUFORT SAMPLE 03 WATER 20C STATION010
3	B00020H	BEAUFORT SAMPLE 03 WATER 20C STATION010
4	B00115H	BEAUFORT SAMPLE 27 WATER 20C STATION071
5	B00123H	BEAUFORT SAMPLE 27 WATER 20C STATION071
6	B00161H	BEAUFORT SAMPLE 24 WATER 20C STATION055

END FORM
6 STRAINS

Strains isolated from sediment at 20C capable of utilizing benzoic acid.

1	B00028H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
2	B00030H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
3	B00032H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
4	B00044H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
5	B00048H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010

END FORM
5 STRAINS

Strains isolated from water at 4C capable of utilizing any of the following hydrocarbons: pentadecane, hexadecane, octadecane, dotriacontane, pristane, dodecylbenzene, 1-phenyltridecane, 2-ethylnaphthalene, phenanthrene.

1 B00117L BEAUFORT SAMPLE 27 WATER 04C STATION071

END FORM [illegible]
STRAINS

Strains isolated from sediment at 4C capable of utilizing any of the following hydrocarbons: pentadecane, hexadecane, octadecane, dotriacontane, pristane, dodecylbenzene, 1-phenyltridecane,2-ethylnaphthalene, phenanthrene.

1	B00251L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
2	B00299L	BEAUFORT SAMPLE 32 SEDIMENT 04C STATION002

END FORM
2 STRAINS

Strains isolated from water at 20C capable of utilizing any of the following hydrocarbons: pentadecane, hexadecane, octadecane, dotriacontane, pristane, dodecylbenzene, 1-phenyltridecane, 2-ethylnaphthalene, phenanthrene.

1	B00002H	BEAUFORT SAMPLE 03 WATER 20C STATION010
2	B00007H	BEAUFORT SAMPLE 03 WATER 20C STATION010
3	B00020H	BEAUFORT SAMPLE 03 WATER 20C STATION010
4	B00106H	BEAUFORT SAMPLE 27 WATER 20C STATION071
5	B00161H	BEAUFORT SAMPLE 24 WATER 20C STATION055
6	B00203H	BEAUFORT SAMPLE 26 WATER 20C STATION070

END FORM
6 STRAINS

Strains isolated from sediment at 20C capable of utilizing any of the following hydrocarbons: pentadecane, hexadecane, octadecane, dotriacontane, pristane, dodecylbenzene, 1-phenyltridecane, 2-ethylnaphthalene, phenanthene.

1	B00028H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
2	B00044H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
3	B00048H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010

END FORM
3 STRAINS

Strains isolated from water at 4C capable of growth at 5C with 3% NaCl, and utilizing any of the following hydrocarbons: pentadecane, hexadecane, octadecane, dotriacontane, pristane, dodecylbenzene, 1-phenyltridecane, 2-ethylnaphthalene, phenanthrene.

1 B00117L BEAUFORT SAMPLE 27 WATER 04C STATION071

END FORM 100192

1 STRAINS

Strains isolated from sediment at 4C capable of growth at 5C with 3% NaCl and utilizing any of the following hydrocarbons: pentadecane, hexadecane, octadecane, dotriacontane, pristane, dodecylbenzene, 1-phenyltridecane, 2-ethylnaphthalene, phenanthene.

1	B00251L	BEAUFORT SAMPLE 09 SEDIMENT 04C STATION030
2	B00299L	BEAUFORT SAMPLE 32 SEDIMENT 04C STATION002

END FORM 100192
2 STRAINS

Strains isolated from water at 20C capable of growth at 5C with 3% NaCl and utilizing any one of the following hydrocarbons: pentadecane, hexadecane, octadecane, dotriacontane, pristane, dodecylbenzene, 1-phenyltridecane, 2-ethylnaphthalene, phenanthene.

1	B00002H	BEAUFORT SAMPLE 03 WATER 20C STATION010
2	B00007H	BEAUFORT SAMPLE 03 WATER 20C STATION010
3	B00020H	BEAUFORT SAMPLE 03 WATER 20C STATION010
4	B00106H	BEAUFORT SAMPLE 27 WATER 20C STATION071
5	B00161H	BEAUFORT SAMPLE 24 WATER 20C STATION055

END FORM
5 STRAINS

Strains isolated from sediment at 20C capable of growth at 5C with 3% NaCl and utilizing any of the following hydrocarbons: pentadecane, hexadecane, octadecane, dotriacontane, pristane, dodecylbenzene, 1-phenyltridecane, 2-ethylnaphthalene, phenanthene.

1	B00028H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
2	B00044H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010
3	B00048H	BEAUFORT SAMPLE 03 SEDIMENT 20C STATION010

END FORM
3 STRAINS

Strains isolated from water at 4C which require at least one growth factor for growth.

1	B00003L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
2	B00005L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
3	B00006L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
4	B00009L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
5	B00012L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
6	B00013L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
7	B00014L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
8	B00015L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
9	B00021L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
10	B00022L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
11	B00023L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
12	B00024L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
13	B00025L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
14	B00051L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
15	B00052L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
16	B00053L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
17	B00054L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
18	B00055L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
19	B00057L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
20	B00058L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
21	B00059L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
22	B00060L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
23	B00061L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
24	B00062L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
25	B00066L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
26	B00067L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
27	B00068L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
28	B00069L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
29	B00070L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
30	B00071L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
31	B00072L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
32	B00073L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
33	B00074L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
34	B00075L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
35	B00101L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
36	B00102L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
37	B00103L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
38	B00104L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
39	B00105L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
40	B00106L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
41	B00107L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
42	B00108L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
43	B00109L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
44	B00110L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
45	B00111L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
46	B00112L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
47	B00113L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
48	B00114L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
49	B00115L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
50	B00116L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071

51	B00118L	BEAUFORT SAMPLE 27 WATER 04C STATION071
52	B00119L	BEAUFORT SAMPLE 27 WATER 04C STATION071
53	B00120L	BEAUFORT SAMPLE 27 WATER 04C STATION071
54	B00121L	BEAUFORT SAMPLE 27 WATER 04C STATION071
55	B00122L	BEAUFORT SAMPLE 27 WATER 04C STATION071
56	B00123L	BEAUFORT SAMPLE 27 WATER 04C STATION071
57	B00124L	BEAUFORT SAMPLE 27 WATER 04C STATION071
58	B00125L	BEAUFORT SAMPLE 27 WATER 04C STATION071
59	B00151L	BEAUFORT SAMPLE 24 WATER 04C STATION055
60	B00152L	BEAUFORT SAMPLE 24 WATER 04C STATION055
61	B00153L	BEAUFORT SAMPLE 24 WATER 04C STATION055
62	B00154L	BEAUFORT SAMPLE 24 WATER 04C STATION055
63	B00155L	BEAUFORT SAMPLE 24 WATER 04C STATION055
64	B00156L	BEAUFORT SAMPLE 24 WATER 04C STATION055
65	B00157L	BEAUFORT SAMPLE 24 WATER 04C STATION055
66	B00159L	BEAUFORT SAMPLE 24 WATER 04C STATION055
67	B00160L	BEAUFORT SAMPLE 24 WATER 04C STATION055
68	B00162L	BEAUFORT SAMPLE 24 WATER 04C STATION055
69	B00163L	BEAUFORT SAMPLE 24 WATER 04C STATION055
70	B00164L	BEAUFORT SAMPLE 24 WATER 04C STATION055
71	B00165L	BEAUFORT SAMPLE 24 WATER 04C STATION055
72	B00166L	BEAUFORT SAMPLE 24 WATER 04C STATION055
73	B00167L	BEAUFORT SAMPLE 24 WATER 04C STATION055
74	B00168L	BEAUFORT SAMPLE 24 WATER 04C STATION055
75	B00169L	BEAUFORT SAMPLE 24 WATER 04C STATION055
76	B00170L	BEAUFORT SAMPLE 24 WATER 04C STATION055
77	B00171L	BEAUFORT SAMPLE 24 WATER 04C STATION055
78	B00172L	BEAUFORT SAMPLE 24 WATER 04C STATION055
79	B00173L	BEAUFORT SAMPLE 24 WATER 04C STATION055
80	B00174L	BEAUFORT SAMPLE 24 WATER 04C STATION055
81	B00175L	BEAUFORT SAMPLE 24 WATER 04C STATION055
82	B00201L	BEAUFORT SAMPLE 26 WATER 04C STATION070
83	B00202L	BEAUFORT SAMPLE 26 WATER 04C STATION070
84	B00203L	BEAUFORT SAMPLE 26 WATER 04C STATION070
85	B00204L	BEAUFORT SAMPLE 26 WATER 04C STATION070
86	B00205L	BEAUFORT SAMPLE 26 WATER 04C STATION070
87	B00206L	BEAUFORT SAMPLE 26 WATER 04C STATION070
88	B00207L	BEAUFORT SAMPLE 26 WATER 04C STATION070
89	B00208L	BEAUFORT SAMPLE 26 WATER 04C STATION070
90	B00209L	BEAUFORT SAMPLE 26 WATER 04C STATION070
91	B00210L	BEAUFORT SAMPLE 26 WATER 04C STATION070
92	B00211L	BEAUFORT SAMPLE 26 WATER 04C STATION070
93	B00212L	BEAUFORT SAMPLE 26 WATER 04C STATION070
94	B00213L	BEAUFORT SAMPLE 26 WATER 04C STATION070
95	B00214L	BEAUFORT SAMPLE 26 WATER 04C STATION070
96	B00215L	BEAUFORT SAMPLE 26 WATER 04C STATION070
97	B00216L	BEAUFORT SAMPLE 26 WATER 04C STATION070
98	B00217L	BEAUFORT SAMPLE 26 WATER 04C STATION070
99	B00218L	BEAUFORT SAMPLE 26 WATER 04C STATION070
100	B00219L	BEAUFORT SAMPLE 26 WATER 04C STATION070

101	B00220L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
102	B00221L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
103	B00222L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
104	B00223L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
105	B00224L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
106	B00225L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
107	B00278L	BEAUFORT	SAMPLE	11	WATER	04C	STATION030
108	B00280L	BEAUFORT	SAMPLE	11	WATER	04C	STATION030
109	B00281L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
110	B00283L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
111	B00284L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
112	B00291L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002
113	B00292L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002
114	B00294L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002
115	B00295L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002

END FORM

115 STRAINS

Strains isolated from sediment at 4C which require at least one growth factor for growth.

1	B00028L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
2	B00029L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
3	B00030L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
4	B00031L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
5	B00032L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
6	B00033L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
7	B00034L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
8	B00036L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
9	B00037L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
10	B00038L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
11	B00039L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
12	B00040L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
13	B00041L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
14	B00042L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
15	B00043L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
16	B00046L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
17	B00050L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
18	B00076L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
19	B00078L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
20	B00079L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
21	B00081L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
22	B00082L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
23	B00083L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
24	B00084L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
25	B00085L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
26	B00086L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
27	B00087L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
28	B00088L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
29	B00089L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
30	B00091L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
31	B00092L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
32	B00094L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
33	B00095L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
34	B00096L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
35	B00097L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
36	B00098L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
37	B00099L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
38	B00100L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
39	B00127L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
40	B00129L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
41	B00130L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
42	B00132L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
43	B00133L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
44	B00134L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
45	B00136L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
46	B00138L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
47	B00139L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
48	B00140L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
49	B00141L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
50	B00143L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071

51	B00146L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
52	B00147L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
53	B00148L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
54	B00150L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
55	B00176L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
56	B00177L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
57	B00178L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
58	B00179L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
59	B00180L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
60	B00181L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
61	B00182L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
62	B00183L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
63	B00187L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
64	B00188L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
65	B00190L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
66	B00192L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
67	B00193L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
68	B00194L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
69	B00195L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
70	B00196L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
71	B00198L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
72	B00199L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
73	B00200L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
74	B00226L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
75	B00227L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
76	B00228L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
77	B00229L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
78	B00230L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
79	B00231L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
80	B00232L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
81	B00233L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
82	B00234L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
83	B00236L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
84	B00237L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
85	B00238L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
86	B00239L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
87	B00240L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
88	B00242L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
89	B00243L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
90	B00245L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
91	B00246L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
92	B00247L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
93	B00248L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
94	B00249L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
95	B00250L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
96	B00251L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
97	B00254L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
98	B00256L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
99	B00258L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
100	B00260L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030

101	B00262L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
102	B00263L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
103	B00264L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
104	B00266L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
105	B00267L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
106	B00269L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
107	B00270L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
108	B00271L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
109	B00275L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
110	B00286L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
111	B00287L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
112	B00288L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
113	B00289L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
114	B00290L	BEAUFORT	SAMPLE	15	SEDIMENT	04C	STATION001
115	B00296L	BEAUFORT	SAMPLE	02	SEDIMENT	04C	STATION002
116	B00297L	BEAUFORT	SAMPLE	02	SEDIMENT	04C	STATION002
117	B00298L	BEAUFORT	SAMPLE	02	SEDIMENT	04C	STATION002
118	B00300L	BEAUFORT	SAMPLE	02	SEDIMENT	04C	STATION002

END FORM
118 STRATA.

Strains isolated from water at 20C which require at least one growth factor for growth.

1	B00003H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
2	B00004H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
3	B00005H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
4	B00006H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
5	B00008H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
6	B00010H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
7	B00011H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
8	B00012H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
9	B00013H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
10	B00014H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
11	B00015H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
12	B00016H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
13	B00017H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
14	B00018H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
15	B00019H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
16	B00021H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
17	B00022H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
18	B00023H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
19	B00051H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
20	B00052H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
21	B00053H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
22	B00054H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
23	B00056H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
24	B00057H	BEAUFORT	SAMPLE	20	WATER	20C	STATION020
25	B00058H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
26	B00059H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
27	B00060H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
28	B00061H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
29	B00062H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
30	B00063H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
31	B00064H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
32	B00065H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
33	B00066H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
34	B00067H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
35	B00068H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
36	B00069H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
37	B00070H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
38	B00071H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
39	B00072H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
40	B00073H	BEAUFORT	SAMPLE	20	WATER	20C	STATION002
41	B00101H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
42	B00102H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
43	B00103H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
44	B00104H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
45	B00109H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
46	B00110H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
47	B00113H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
48	B00114H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
49	B00115H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
50	B00116H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071

51	B00117H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
52	B00118H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
53	B00119H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
54	B00120H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
55	B00121H	BEAUFORT	SAMPLE	27	WATER	20C	STATION071
56	B00151H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
57	B00152H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
58	B00153H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
59	B00154H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
60	B00155H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
61	B00156H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
62	B00157H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
63	B00158H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
64	B00160H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
65	B00162H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
66	B00163H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
67	B00164H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
68	B00165H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
69	B00166H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
70	B00168H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
71	B00169H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
72	B00170H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
73	B00201H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
74	B00202H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
75	B00203H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
76	B00204H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
77	B00205H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
78	B00206H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
79	B00207H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
80	B00208H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
81	B00210H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
82	B00211H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
83	B00212H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
84	B00213H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
85	B00216H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
86	B00217H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
87	B00219H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
88	B00221H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
89	B00222H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
90	B00251H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
91	B00252H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
92	B00253H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
93	B00254H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
94	B00255H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
95	B00256H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
96	B00258H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
97	B00260H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
98	B00261H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
99	B00262H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
100	B00263H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
101	B00264H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
102	B00265H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
103	B00266H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
104	B00268H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
105	B00269H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
106	B00270H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
107	B00271H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
108	B00272H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
109	B00273H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
110	B00275H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030

END FORM

Strains isolated from sediment at 20C which require at least one growth factor for growth.

1	B00026H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
2	B00027H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
3	B00029H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
4	B00030H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
5	B00031H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
6	B00032H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
7	B00033H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
8	B00035H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
9	B00036H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
10	B00037H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
11	B00038H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
12	B00039H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
13	B00040H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
14	B00041H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
15	B00042H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
16	B00043H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
17	B00045H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
18	B00047H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
19	B00076H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
20	B00077H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
21	B00078H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
22	B00079H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
23	B00080H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
24	B00081H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
25	B00082H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
26	B00083H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
27	B00084H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
28	B00085H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
29	B00086H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
30	B00087H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
31	B00088H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
32	B00089H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
33	B00091H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
34	B00092H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
35	B00093H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
36	B00094H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
37	B00095H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
38	B00096H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
39	B00097H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
40	B00098H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
41	B00099H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
42	B00126H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
43	B00128H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
44	B00129H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
45	B00130H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
46	B00131H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
47	B00132H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
48	B00133H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
49	B00136H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
50	B00138H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071

51	B00139H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
52	B00140H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
53	B00141H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
54	B00142H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
55	B00144H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
56	B00145H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
57	B00146H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
58	B00148H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
59	B00149H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
60	B00150H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
61	B00176H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
62	B00177H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
63	B00178H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
64	B00179H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
65	B00180H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
66	B00181H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
67	B00184H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
68	B00185H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
69	B00186H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
70	B00188H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
71	B00189H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
72	B00190H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
73	B00191H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
74	B00192H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
75	B00193H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
76	B00194H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
77	B00195H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
78	B00196H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
79	B00197H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
80	B00198H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
81	B00199H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
82	B00200H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
83	B00226H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
84	B00227H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
85	B00228H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
86	B00229H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
87	B00231H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
88	B00232H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
89	B00234H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
90	B00235H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
91	B00236H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
92	B00237H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
93	B00238H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
94	B00240H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
95	B00241H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
96	B00242H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
97	B00243H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
98	B00244H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
99	B00245H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
100	B00246H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070

101	B00247H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
102	B00248H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
103	B00250H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
104	B00277H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
105	B00278H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
106	B00279H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
107	B00280H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
108	B00281H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
109	B00282H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
110	B00283H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
111	B00284H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
112	B00287H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
113	B00288H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
114	B00289H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
115	B00290H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
116	B00292H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
117	B00293H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
118	B00294H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
119	B00295H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
120	B00296H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
121	B00297H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
122	B00298H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
123	B00299H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030

END FORM
123 STRAINS

Strains isolated from water at 4C which require yeast extract and amino acids as growth factors.

1	B00013L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
2	B00015L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
3	B00021L	BEAUFORT	SAMPLE	03	WATER	04C	STATION010
4	B00055L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
5	B00061L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
6	B00066L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
7	B00068L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
8	B00069L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
9	B00070L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
10	B00072L	BEAUFORT	SAMPLE	20	WATER	04C	STATION002
11	B00101L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
12	B00102L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
13	B00105L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
14	B00110L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
15	B00118L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
16	B00123L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
17	B00124L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
18	B00125L	BEAUFORT	SAMPLE	27	WATER	04C	STATION071
19	B00162L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
20	B00168L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
21	B00172L	BEAUFORT	SAMPLE	24	WATER	04C	STATION055
22	B00204L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
23	B00207L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
24	B00209L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
25	B00214L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
26	B00215L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
27	B00219L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
28	B00224L	BEAUFORT	SAMPLE	26	WATER	04C	STATION070
29	B00281L	BEAUFORT	SAMPLE	19	WATER	04C	STATION001
30	B00292L	BEAUFORT	SAMPLE	36	WATER	04C	STATION002

END FORM
30 STRAINS

Strains isolated from sediment at 4C which require yeast extract and amino acids as growth factors.

1	B00033L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
2	B00034L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
3	B00036L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
4	B00037L	BEAUFORT	SAMPLE	03	SEDIMENT	04C	STATION010
5	B00079L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
6	B00083L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
7	B00085L	BEAUFORT	SAMPLE	16	SEDIMENT	04C	STATION002
8	B00132L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
9	B00139L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
10	B00141L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
11	B00143L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
12	B00147L	BEAUFORT	SAMPLE	22	SEDIMENT	04C	STATION071
13	B00179L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
14	B00180L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
15	B00182L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
16	B00183L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
17	B00188L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
18	B00196L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
19	B00200L	BEAUFORT	SAMPLE	20	SEDIMENT	04C	STATION055
20	B00240L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
21	B00246L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
22	B00248L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
23	B00249L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
24	B00250L	BEAUFORT	SAMPLE	21	SEDIMENT	04C	STATION070
25	B00256L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
26	B00259L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
27	B00262L	BEAUFORT	SAMPLE	09	SEDIMENT	04C	STATION030
28	B00298L	BEAUFORT	SAMPLE	32	SEDIMENT	04C	STATION002
29	B00300L	BEAUFORT	SAMPLE	32	SEDIMENT	04C	STATION002

END FORM 100192
29 STRAINS

Strains isolated from water at 20C which require yeast extract and amino acids as growth factors.

1	B00011H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
2	B00015H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
3	B00019H	BEAUFORT	SAMPLE	03	WATER	20C	STATION010
4	B00159H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
5	B00170H	BEAUFORT	SAMPLE	24	WATER	20C	STATION055
6	B00223H	BEAUFORT	SAMPLE	26	WATER	20C	STATION070
7	B00253H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030
8	B00259H	BEAUFORT	SAMPLE	11	WATER	20C	STATION030

END FORM 100191

8 STRAINS

Strains isolated from sediment at 20C which require yeast extract and amino acids as growth factors.

1	B00035H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
2	B00037H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
3	B00039H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
4	B00077H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
5	B00080H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
6	B00081H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
7	B00082H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
8	B00083H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
9	B00084H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
10	B00087H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
11	B00089H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
12	B00091H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
13	B00092H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
14	B00094H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
15	B00095H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
16	B00100H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
17	B00126H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
18	B00127H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
19	B00128H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
20	B00133H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
21	B00138H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
22	B00142H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
23	B00144H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
24	B00148H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
25	B00149H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
26	B00150H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION055
27	B00176H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
28	B00179H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
29	B00181H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
30	B00186H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
31	B00196H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
32	B00199H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
33	B00228H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
34	B00234H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
35	B00235H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
36	B00236H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
37	B00237H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
38	B00245H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
39	B00247H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
40	B00277H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
41	B00278H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
42	B00280H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
43	B00284H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
44	B00287H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
45	B00288H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
46	B00289H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
47	B00290H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
48	B00292H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
49	B00293H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
50	B00294H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
51	B00296H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
52	B00298H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030
53	B00299H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030

END FORM
53 STRAINS

Strains isolated from water at 4C which require unknown growth factors.

1	B00003L	BEAUFORT SAMPLE 03 WATER 04C STATION010
2	B00022L	BEAUFORT SAMPLE 03 WATER 04C STATION010
3	B00023L	BEAUFORT SAMPLE 03 WATER 04C STATION010
4	B00051L	BEAUFORT SAMPLE 20 WATER 04C STATION002
5	B00064L	BEAUFORT SAMPLE 20 WATER 04C STATION002
6	B00065L	BEAUFORT SAMPLE 20 WATER 04C STATION002

END FORM
6 STRAINS

Strains isolated from sediment at 4C which require unknown growth factors.

1	B00081L	BEAUFORT SAMPLE 16 SEDIMENT 04C STATION002
2	B00088L	BEAUFORT SAMPLE 16 SEDIMENT 04C STATION002
3	B00136L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
4	B00138L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
5	B00140L	BEAUFORT SAMPLE 22 SEDIMENT 04C STATION071
6	B00177L	BEAUFORT SAMPLE 20 SEDIMENT 04C STATION055
7	B00231L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070
8	B00239L	BEAUFORT SAMPLE 21 SEDIMENT 04C STATION070

END FORM 100192
8 STRAINS

Strains isolated from water at 20C which require unknown growth factors.

1	B00124H	BEAUFORT SAMPLE 27 WATER 20C STATION071
2	B00215H	BEAUFORT SAMPLE 26 WATER 20C STATION070
3	B00220H	BEAUFORT SAMPLE 26 WATER 20C STATION070
4	B00267H	BEAUFORT SAMPLE 11 WATER 20C STATION030
5	B00274H	BEAUFORT SAMPLE 11 WATER 20C STATION030

END FORM 100191

5 STRAINS

Strains isolated from sediment at 20C which require unknown growth factors.

1	B00034H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
2	B00040H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
3	B00041H	BEAUFORT	SAMPLE	03	SEDIMENT	20C	STATION010
4	B00076H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
5	B00078H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
6	B00079H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
7	B00088H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
8	B00096H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
9	B00097H	BEAUFORT	SAMPLE	16	SEDIMENT	20C	STATION002
10	B00129H	BEAUFORT	SAMPLE	22	SEDIMENT	20C	STATION071
11	B00197H	BEAUFORT	SAMPLE	20	SEDIMENT	20C	STATION055
12	B00226H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
13	B00227H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
14	B00238H	BEAUFORT	SAMPLE	21	SEDIMENT	20C	STATION070
15	B00281H	BEAUFORT	SAMPLE	09	SEDIMENT	20C	STATION030

END FORM 100191
15 STRAINS

ANNUAL REPORT

Assessment of Potential Interactions of Microorganisms and Pollutants Resulting from Petroleum Development on the Outer Continental Shelf in the Gulf of Alaska

April 1, 1976

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INTRODUCTION

Microorganisms are essential components of all ecosystems. Changes in microbial populations may greatly alter the characteristics of an ecosystem. Human activities often modify the environment for microorganisms. In some cases microorganisms respond to such changes in a way that lessens the human impact. For example, microorganisms are capable of biodegrading many pollutants that man adds to various ecosystems, often maintaining environmental quality in such situations. In some cases, microorganisms are unable to biodegrade polluting materials and undesirable accumulations of the pollutants occur. In still other situations, microorganisms carry out tranformations of the pollutants that produce undesirable toxic products. Microorganisms also carry out metabolic activities essential for ecologic balance. Human modification of an environment may alter the ability of microorganisms to carry out key elemental cycling activities. Some microorganisms cause disease in man or other organisms. Human activities may change the populations of such pathogenic microorganisms, altering the incidence of a particular disease.

This project was designed to investigate the potential interactions of microorganisms and pollutants that may result from development of petroleum resources in the outer continental shelf of the Gulf of Alaska. Knowledge about the naturally occurring microorganisms is essential for such an assessment. Studies have been begun on establishing a baseline description of microbial communities in the Gulf of Alaska. This baseline description includes quantitative information on the occurrence of different physiological groups of microorganisms and on the qualitative taxonomic characteristics of dominant species of microorganisms. It includes information on the ability of the indigenous microorganisms to transform petroleum hydrocarbons that might enter the ecosystem from outer continental shelf petroleum development. Also, information is included on the natural incidence of potential human pathogens in shellfish in the Gulf of Alaska.

MATERIALS AND METHODS

Literature Review

A review of existing literature on microorganisms in the Gulf of Alaska including microorganisms related to petroleum pollutants and pathogenic microorganisms was conducted using the computer search facilities OASIS and of the Lockheed data base. Data bases searched include National Technical Information Service, Biological Abstracts, Bioresearch Index, Oceanic Index, Selected Water Research Abstracts and Chemical Titles. Abstracts were reviewed and appropriate articles obtained from NTIS or the original source.

Sample Collection

Water and sediment samples were collected during October in the western Gulf of Alaska. Samples were collected from the NOAA vessel Discoverer. Water samples were collected with a Niskin sterile water sampler. Sediment samples were collected with a VanVeem grab or Haps corer. Sediment samples were removed aseptically from the top 2 cm of the core or grab sample. Samples were collected at Gulf of Alaska Shelf Study Stations Nos. 101, 102, 103, 104, 105, 106, 119, 121, 124, 133, 134, 137, 145, 146, 148, 156, and 159. The actual location and depth of each samples has been supplied by Discoverer personnel (Fig.1, Table I and II).

Both Dungeness and Tanner crab samples were supplied for analysis of associated microorganisms that are potentially pathogenic for man by the Alaska Department of Fish and Game,Kodiak, and by the National Marine

Fisheries Laboratory, Seattle. Approximately 10 crabs per month have been received since October. The location of the crab collection is supplied by the collecting parties (Fig.2). Most of the crabs were collected in the western Gulf of Alaska. Some Tanner crabs also have been supplied from a cruise of the Miller Freeman in the Bering Sea.

Abiotic Sample Parameters

Salinity, temperature, and depth determinations were made by Discoverer personnel using a STD rosette sampler. The readings from the STD cases are to be supplied after readout of the computer storage. Aliquots of samples were frozen and sent to Dr. Vera Alexander for analysis of phosphate, ammonium, nitrate and silicate concentrations.

Enumeration of Microbial Populations

Direct counts from water. A sample of water was immediately preserved upon collection by addition of formaldehyde 1:1 v/v.

One-tenth to five-tenth milliliters of sample was mixed with one milliliter of 0.1% acridine orange in sterile tris buffer pH 7. One minute after mixing, the stained sample was filtered through a 0.22 μm Sartorius black filter. The filters were immediately viewed with an Olympus epifluorescence microscope, with a BG 12 plus blue exciter filter and a 480 nm blue barrier filter. Cells fluorescing orange or green were counted. Ten fields were counted for each aliquot filtered. Two aliquots from each sample were counted. Counts were converted to number per ml.

Indirect plate counts from water and sediment. Viable microorganisms were enumerated as different physiological groups using different microbiological media and incubation conditions. Two non-selective media, marine agar 2216 and MSWYE, were used for enumeration of total viable microorganisms. Several selective media were also used for enumeration of different groups of microorganisms. TCBS agar was used for enumeration of *Vibrio* species. Pseudosel agar was used for enumeration of *Pseudomonas* species. EMB agar was used for enumeration of enteric bacteria. SS agar was used for enumeration of *Salmonella*-*Shigella* species. Saboraud dextrose agar was used for enumeration of fungi. Oil agar (Bushnell Haas Agar plus 0.5% Prudhoe crude oil plus marine salts) was used for enumeration of oil-utilizing microorganisms. Counts of oil-degrading microorganisms were corrected for organisms that could grow on Bushnell Haas agar without added oil. These media were either incubated at 5C for enumeration of viable psychrophilic and psychrotrophic microorganisms or at 20C for enumeration of viable mesophilic microorganisms.

Depending on the concentrations of microorganisms in the samples counts were either from surface-spread plates of serial dilutions or from Millipore-filtered (0.45 μm) samples. Counts for 20C plates were done after 10 days of incubation; counts for 5C plates were done after 21 days of incubation. Triplicate plates were used for all counts.

Indirect plate counts from crab samples. Tissue from crab muscle, gill or gut was macerated in sterile water, 1 g tissue to 10 ml water. Serial dilutions were surface-spread in triplicate onto either marine agar 2216 for enumeration of total heterotrophs; McConkey's agar for enumeration of gram negative enteric bacteria, and TCBS agar for enumeration of *Vibrio* species. Plates were incubated at 35C aerobically for enumeration of mesophilic populations. Replicate marine agar plates were also incubated anaerobically using a Gas Pak system for enumeration of mesophilic anaerobes.

Qualitative Characterization and Identification of Microorganisms from Water and Sediment Samples

Colonies that developed on marine agar 2216 were restreaked for purification. Colonies isolated at 4C and 20C from different samples were selected at random for taxonomic studies. Colonies were also selected at random from 4C and 20C oil agar plates for characterization of range of hydrocarbon metabolism.

For taxonomic characterization an extensive series of tests were run on each organism. A complete list of tests being used is shown in Table III. Not all organisms are characterized with every test. The tests examine three broad areas: morphology; physiology and biochemistry; and nutritional. Tests from each broad area are needed to characterize and classify a microorganism. Morphological tests include size, shape and specific morphological features. Some of these specific features are shown by staining reactions, the key taxonomic staining test being the gram stain. Other specific features, such as motility, presence of endospores, acid-fast stain reaction, arrangement of cells, etc., are keyed to classical bacterial taxonomy. Physiological and biochemical tests include relation to oxygen, temperature, growth range, salt tolerance, presence of specific enzymes, sensitivity to antibiotics, presence of specific metabolic pathways, etc. These tests can be used both in taxonomic identification of the organisms and in understanding the ecological distribution and role within the ecosystem of these organisms. Nutritional tests include the ability to utilize many different substrates including the ability to metabolize different classes of compounds such as amino acids, carbohydrates, amines, carboxylic acids, alcohols, nucleic acids, and hydrocarbons. Extensive hydrocarbon utilization tests were run for organisms isolated from oil agar.

Identification of microorganisms from crab samples. Tanner crabs were sent from the field frozen; Dungeness crabs were sent from the field alive. For analysis the crabs were separated into muscle and gill tissues. In one case eggs were also recovered. The aseptically removed tissues were macerated and immediately added to tubes of enrichment media. Four different enrichment media were used to maximize the probability of isolating any microorganisms present that were capable of causing human disease. The initial enrichment media used were Trypticase Soy Broth with and without 3% marine salts added, and Brilliant Green Bile Broth with and without 3% marine salts added. Incubation of replicate initial enrichments was for 24 hours aerobically at 25C and at 35C. Additionally incubated plates of Trypticase Soy Agar were incubated at 35C under anaerobic conditions using a Gas Pak anaerobic system.

The enrichment cultures were then streaked onto isolation media. The isolation media used were Trypticase Soy Agar, marine agar 2216, EMB agar, EMB agar with 3% marine salts, SS agar, SS agar with 3% marine salts and TCBS agar. The EMB, SS and TCBS media are designed for the isolation of enteric bacteria, *Salmonella-Shigella* species and *Vibrio* species respectively. All of these are gram negative bacterial species. Trypticase Soy Agar and marine agar 2216 are considered non-selective media.

All distinguishable colonies were isolated for identification. All isolates were capable of growth on Trypticase Soy Agar and were therefore maintained on this medium. Gram negative rods were identified using the API 20E identification system. Gram positive cocci were identified by morphology, mannitol salt reaction, catalase production, reaction on blood agar, growth in SF medium, and optochin and/or bacitracin sensitivity tests. Gram positive rods were examined for presence of endospores and relation to oxygen.

In vivo Pathogenicity Studies

Cultures of Yersinia, Klebsiella, and Staphylococcus isolated from the crabs were prepared for administration to mice by intraperitoneal, intravenous or oral routes. The cells were washed free of medium by centrifugation and resuspended in non-pyrogenic sterile physiological saline. Replicate cells were also suspended in saline without washing. For intraperitoneal administration, the cells are injected with a 26g hypodermic needle. For oral administration, the cell suspension is added to the drinking bottles of animals who have been deprived of water overnight. The test animals were adult CFW male mice, 6 to 8 weeks old. Each test was performed in triplicate. The animals were observed for one week after treatment, or until death occurred, for behavioral symptoms. Animals that survived one week were killed by etherization and an autopsy performed. The lung, liver, mesentery, intestine, and spleen were examined for gross pathology. Animals that died during the week were immediately examined.

Analysis of data. In order to analyse the data generated from taxonomic testing, an agreement was made with Dr. Micah Krichevsky, National Institute of Health, for use of the NIH computer programs and facilities. The data is arranged in a searchable form so that organisms with any tested characteristic of interest, e.g. ability to metabolize hydrocarbons, can be identified by source of isolation. When testing of organisms is completed, the programs allow for comparison to other organisms including known organisms with generation of similarity coefficients. The API 20E system was used for identification of isolates from crabs.

RESULTS AND DISCUSSION

Literature Review

A review of the literature showed that while a large number of studies have been reported on distribution of microorganisms in marine environments, on the microbial degradation of petroleum hydrocarbons and on the occurrence of microorganisms in shellfish that cause human disease, only a few studies have been conducted in or near the Gulf of Alaska. A bibliographic listing of those reports directly applicable to the Gulf of Alaska is shown in Table IV. This table also includes reference to some major reviews of the field.

Abiotic Sample Parameters

It was only possible to complete nutrient analysis on a few of the water samples collected (Table V). Nitrogen in most samples was equally proportioned between NO_3 and NH_3. The average total inorganic nitrogen was approximately 13 μg at -N/l. Phosphate-P was present in lower concentrations than nitrogen, averaging 2 μg at -P/l. Only at Station 133 were phosphate concentrations high, 6.7 μg at P/l. Silicates ranged from 9 to 14 μg at Si/l..

Enumeration of Microorganisms

Direct counts from water samples. The direct counts on water samples ranged from 1×10^5 to 5×10^5/l (Table VI). All counts were of the order 10^5 organisms per ml. The highest counts were found at Stations 156 and 159 which were nearest to the Bering Sea.

Indirect counts from water and sediment. The indirect plate counts of aerobic heterotrophic microorganisms (Tables VII-X) from water were statistically significantly lower than the direct counts. Counts on marine agar 2216 (Tables VII-VIII) were higher than on MSWYE media (Tables IX-X). Therefore it was decided to use only marine agar 2216 in future work for total viable counts. The counts of mesophilic microorganisms were higher in almost all cases than the counts of psychrophiles and psychrotrophs. The total viable mesophilic counts from water ranged from 10^1 to 10^3/ml. The total viable psychrophilic-psychrotrophic counts from water ranged from 10^1-10^2/ml. The highest total viable counts from water were found at Stations 156 and 159 nearest the Bering Sea.

The indirect plate counts of heterotrophs from sediment samples were several orders of magnitude higher than comparable counts from water. Heterophic counts in sediment ranged from 10^4-10^6/gm dry wt. Mesophilic counts from sediment samples were slightly higher than psychrophilic-psychrotrophic counts.

Counts of fungi in sediments (Tables XI-XII) were 1-2 orders of magnitude lower than the total heterotrophic count. Some bacteria are capable of growing on the media used to select for fungi and may appear in these counts. Although only a few mesophilic fungal counts were performed, the comparable psychrophilic-psychrotrophic counts were higher. Counts of fungi in water showed generally less than 10/ml.

Counts of specific bacterial groups were very low. No mesophilic Pseudomonas sp. were detected in any of the water or sediment samples indicating if such organisms were present, they were in very low concentrations (Table XIII). Organisms that developed on the media selective for Salmonella-Shigella genera were also low with no colonies from sediment samples and less than 1/ml from water samples (Table XIV). Counts of "enteric" bacteria were similarly low (Table XV). Mesophilic Vibrio species, on the other hand, were detected in all samples tested and showed counts as high as 10^4/gm dry wt. in sediment samples (Table XVIII). With the exception of the Pseudomonas counts such results are consistent with other marine areas.

Oil-utilizing microorganisms were not detected in most samples tested (Tables XVII-XVIII). Only in one case at Station 124 were counts in excess of 10/ml. In most cases the numbers of oil-degrading microorganisms were less than 1/ml. These counts are consistent with other non-polluted marine areas.

Plate counts from crab samples. The microbial counts from crab samples are shown in Table XIX. The counts show that the greatest concentration of bacteria occurred in the gills of the crabs and that muscle tissue had relatively few bacteria per gram. There were also significant differences between the counts from crabs collected from different regions. The lowest counts were for the crabs collected from the Bering Sea. The highest counts were from the Dungeness crabs collected near Kodiak City.

Characterization of Microbial Isolants from Water and Sediment Samples

Only the morphological characteristics of 206 of the 370 heterotrophic isolants from Gulf of Alaska water and sediment samples have been completed and processed for computer analysis. A summary of some of the key morphological characteristics is shown in Table XX. Clearly, the majority of organisms isolated from both sediment and water samples were gram negative and were rod-shaped (Table XXI). Only 5.3% of the organisms were gram positive and only 1.6% of all organisms were coccoid-shaped. Almost two-thirds of all organisms were motile. There was a significant difference in motility between organisms isolated at 4C (75.8% motile) and those isolated at 20C (50.5% motile).

Although only a limited amount of data presently is stored in the computer for searching, it was decided to test the versatility of the data retrieval system and analyse some of the data that was stored. Examples of computer output are shown in Tables XXII and XXIII. In Table XXII the data was searched for the source of all of the gram positive isolants and the output showed that the distribution of these organisms is sparce but not restricted to one location. The data was searched for endospore-forming bacteria. Gram positive aerobic endospore-forming bacteria are members of the genus Bacillus. Endospore production is important because it is associated with heat resistance. Only one such organism was found, it having been isolated from sediment at 20C from Station 137. In Table XXIII the data was searched for positive reaction on acid fast staining. Most such isolants were from Station 133. Acid fast staining is a characteristic test for the genus Mycobacterium which contains several pathogenic species. Other searches of the data were used to generate Tables XX and XXI.

Several organisms isolated from oil agar plates have been tested for their ability to utilize 50 different hydrocarbons.

Identification of Microbial Isolants from Crab Samples

The species of bacteria that have been isolated from Dungeness and Tanner crabs are shown in Tables XXIV and XXV respectively. Examination of the data shows that the Dungeness crabs collected nearest Kodiak Island harbor in October had the greatest number of microbial species. In these Dungeness crabs many gram negative microorganisms were found in gill and muscle tissue as well as gram positive isolants. Many of these gram negative bacteria are considered as indicators of human pollution. In the gill and muscle tissues of Tanner crabs isolated in Ugak Bay in December away from human activity there were fewer species of gram negative isolants. The frequency of occurrence of the isolants in muscle of Dungeness crabs was Staphylococcus >Sarcina >Acinetobacter >all others. In Dungeness crab gill tissue the isolation frequency was Streptococcus >Pseudomonas >Alcaligenes >Moraxella = Acinetobacter = Aeromonas = Citrobacter = Enterobacter >Sarcina = Yersinia = Staphylococcus = Klebsiella. In Tanner crab muscle and gill Staphylococcus was isolated more frequently than Micrococcus. In the eggs of Tanner crabs Staphylococcus was also most frequently isolated.

Pathogenicity Studies

Three mice injected with coagulose negative Staphylococcus intravenously developed behavioral symptoms, lethargy, and disinterest in food, 24 hours after injection. The symptoms lasted for 3 days after which the animals recovered. Autopsy failed to show any pathological abnormalities.

Of six mice exposed to the Yersinia enterocolytica, 2 by iv, 2 by ip, and 2 orally, all showed behavioral symptoms 24 hours after inoculation. Symptoms included staggering, lethargy, and lack of responsiveness. One mouse died 5 days after intravenous injection.

Of 12 mice inoculated with Klebsiella all showed overt symptoms and 4 of the mice died. The greatest death occurred with intraperitoneal injection. It was possible to recover Klebsiella pneumoniae of the same biotype as the culture used for inoculation from blood, liver, spleen, and kidney of these dead mice. No deaths occurred following oral inoculation.

It appears from these results that serious potential human pathogens are associated with crabs collected from near Kodiak harbor. Further studies should immediately be conducted to assess the safety of commercial fishing for these crabs and consideration should be given to condemning such contaminated fishing areas.

TABLES

and

FIGURES

Table I

SAMPLE DESCRIPTION

SAMPLE NO.	DAY	MOYR	LOCATION	STATION	TYPE
*GW0101?01	14	1075	GULF OF ALASKA	STATION101	WATER
*GW0102?01	14	1075	GULF OF ALASKA	STATION102	WATER
*GW0103?01	14	1075	GULF OF ALASKA	STATION103	WATER
*GW0104?01	15	1075	GULF OF ALASKA	STATION104	WATER
*GW0105?01	15	1075	GULF OF ALASKA	STATION105	WATER
*GW0106?01	15	1075	GULF OF ALASKA	STATION106	WATER
*GW0119?01	14	1075	GULF OF ALASKA	STATION119	WATER
*GW0124?01	13	1075	GULF OF ALASKA	STATION124	WATER
*GW0133?01	12	1075	GULF OF ALASKA	STATION133	WATER
*GW0133?01	12	1075	GULF OF ALASKA	STATION137	WATER
*GW0145?01	11	1075	GULF OF ALASKA	STATION145	WATER
*GW0148?01	11	1075	GULF OF ALASKA	STATION148	WATER
*GW0156?01	10	1075	GULF OF ALASKA	STATION156	WATER
*GW0159?01	10	1075	GULF OF ALASKA	STATION159	WATER

*GB0101?01	14	1075	GULF OF ALASKA	STATION101	SEDIMENT
*GB0121?01	13	1075	GULF OF ALASKA	STATION121	SEDIMENT
*GB0134?01	12	1075	GULF OF ALASKA	STATION134	SEDIMENT
*GB0137?01	12	1075	GULF OF ALASKA	STATION137	SEDIMENT
*GB0146?01	11	1075	GULF OF ALASKA	STATION146	SEDIMENT
*GB0148?01	11	1075	GULF OF ALASKA	STATION148	SEDIMENT

Table II

SAMPLE NO.	SAMPLE LOCATION			
	LATITUDE	LONGITUDE	DEPTH(M)	TEMP(C)
*GW0101?02	59-18.60N	152-23.48W	002.0	+9.1
*GW0102?02	59-10.10N	152-04.45W	002.0	+9.2
*GW0103?02	59-00.55N	151-48.15W	002.0	+9.3
*GW0104?02	58-50.00N	151-26.15W	002.0	+8.4
*GW0105?02	58-40.11N	151-07.32W	002.0	+8.4
*GW0106?02	58-28.74N	150-49.28W	002.0	+7.7
*GW0119?02	57-06.01N	156-00.58W	002.0	+8.6
*GW0124?02	56-07.01N	154-39.93W	002.0	+8.3
*GW0133?02	55-44.82N	158-49.33W	002.0	+8.8
*GW0137?02	54-55.03N	157-58.54W	002.0	+8.6
*GW0145?02	55-01.00N	161-19.8 W	002.0	+8.0
*GW0148?02	54-23.69N	160-49.24W	002.0	+7.8
*GW0156?02	54-29.00N	165-11.4 W	002.0	+6.4
*GW0159?02	53-51.98N	164-33.71W	002.0	+7.5
*GB0101?02	59-18.60N	152-23.48W	091.0	–
*GB0121?02	56-43.64N	155-27.98W	230.5	–
*GB0134?02	55-33.58N	158-39.95W	154.0	–
*GB0137?02	54-55.03N	157-58.54W	099.0	–
*GB0146?02	54-49.50N	161-11.77W	075.0	–
*GB0148?02	54-23.69N	160-49.24W	109.7	–

Table III

ATLAS QUESTION SET SEQUENTIAL

003001: Cells are spherical.
003005: Cells are pear-shaped.
003008: Cells are rod-shaped.
003011: Rod axis is curved in one plane.
003013: Rod axis is helical (spiral).
003016: Rods have tapered ends.
003017: Rods have rounded ends.
003018: Rods have square ends.
003023: Pleomorphic cells are characteristic.
003026: Longer axis of rod is less than twice the shorter axis (cocco-bacillary).
004001: Longest axis of each cell is less than 0.5 micrometer.
004002: Longest axis of each cell is 0.5 - 1 micrometer.
004003: Longest axis of each cell is 1.1 - 2.0 micrometers.
004004: Longest axis of each cell is 2.1 - 3.0 micrometers.
004005: Longest axis of each cell is 3.1 - 4.0 micrometers.
004006: Longest axis of each cell is 4.1 - 5.0 micrometers.
004007: Longest axis of each cell is 5.1 - 10 micrometers.
004008: Longest axis of each cell is 11 - 15 micrometers.
004009: Longest axis of each cell is 16 - 100 micrometers.
004011: Shortest axis of each cell is less than 0.5 micrometer.
004012: Shortest axis of each cell is 0.5 - 1 micrometer.
004013: Shortest axis of each cell is 1.1 - 2.0 micrometers.
004014: Shortest axis of each cell is 2.1 - 3.0 micrometers.
004015: Shortest axis of each cell is 3.1 - 4.0 micrometers.
004016: Shortest axis of each cell is 4.1 - 5.0 micrometers.
005004: Poly beta-hydroxybutyric acid inclusions in the cell.
005006: Poly metaphosphate inclusions (volutin) in the cell.
006001: Endospores produced (any refractile intracellular body capable of germination into a new vegetative cell).
006007: Endospore(s) central in sporangium.
006008: Endospore(s) terminal.
006014: Endospores wider than the vegetative cell (sporangium swollen).
008001: Cells branch.
011001: Capsule is present.
012009: Cells are acid fast by Ziehl-Neelsen method.
012014: Sudan black B reveals intracellular lipids (fat bodies) (also see Sections 5 and 21).
012021: Gram positive.
012022: Gram negative.
012023: Gram variable.
013001: Cells motile.
013004: Cells demonstrate creeping or gliding motility on a solid surface.
013009: Cells have flagella.
013010: Flagella polar.
013022: Flagella peritrichous.
013023: Two or more flagella of distinctly different appearance in different locations on the cell.
015001: Cells occur singly.
015002: Cells occur in pairs.
015003: Cells arranged in angular fashion after division (snapping).
015004: Cells occur in chains.
015005: Cells arranged in irregular aggregates.

015006: Cells arranged in two-dimensional tetrads.
015007: Cells arranged in cubical packets (three-dimensional).
015017: Organisms filamentous, greater than 10 micrometers, if multicellular the organism has little or no indentation at each septum (For branched filaments also see Section 8).
016005: Agar macro-colonies are translucent.
016006: Agar macro-colonies are transparent.
016007: Agar macro-colonies are opaque.
016008: Agar macro-colony margin is entire.
016009: Agar macro-colony margin is erose.
016010: Agar macro-colony margin is filamentous (rhizoid).
016015: Agar macro-colony is convoluted.
016016: Agar macro-colony is flat (membranous).
016017: Agar macro-colony is raised but not convex.
016018: Agar macro-colony is umbonate.
016019: Colony swarming is exhibited on agar (dispersion of individual members of a population due to active motility).
016023: Colony consistency is viscid (mucoid).
016027: Colony surface is glistening.
016028: Colony surface is dull (matte).
016030: Colony surface is smooth.
016031: Colony surface is rough.
016043: Floccular growth in liquid culture.
016044: Ring growth on the wall of the tube in liquid culture.
016046: Pellicle in liquid culture.
016053: Growth takes place at an initial pH of 9.0.
016054: Growth takes place at an initial pH of 7.0.
016055: Growth takes place at an initial pH of 6.0.
016056: Growth takes place at an initial pH of 5.0.
016057: Growth takes place at an initial pH of 4.0.
016060: In 1.5-2.0% previously solidified agar, inoculated by stab, growth is confined to the surface or a depth from the surface of approximately no greater than 1 mm. (i.e., an obligate aerobe)
016062: In 1.5-2.0% previously solidified agar, inoculated by stab, growth begins BELOW THE SURFACE when incubated in air.
016063: In 1.5-2.0% previously solidified agar, inoculated by seeding or by stab, incubated in air, growth is largely confined to a linear dimension of approximately 5 cm from the bottom of the tube in a 16 x 150 mm tube filled with medium to a depth of 9-10 cm. (i.e., obligate anaerobe)
016136: Molecular nitrogen can be used as the sole source of nitrogen.
016137: Ammonium salts can serve as the sole source of nitrogen for growth.
016138: Nitrate can serve as the sole source of nitrogen for growth.
016139: Nitrite can serve as the sole source of nitrogen for growth.
016187: Growth takes place at an initial pH of 8.0.
016189: Agar macro-colony is convex.
016190: Turbidity of liquid culture is evenly dispersed.
016194: Growth takes place at an initial pH of 10.0.
016206: Maximum turbidity in liquid cultures is slight.
016207: Maximum turbidity in liquid cultures is moderate.
016208: Maximum turbidity in liquid cultures is heavy.
016212: At least one vitamin (growth factor) is required for growth.
016249: Urea can be used as the sole source of nitrogen.
016347: Urea can be used as the sole source of carbon and nitrogen.
016357: Isolated agar colonies are less than 1 mm. diameter within ten days.
016358: Isolated agar colonies are 1-2 mm diameter within ten days.
016359: Isolated agar colonies are 2-6 mm diameter within ten days.
016361: Agar macro-colony margin is lobate.

016362: Agar macro-colony margin is undulate.
016363: Colony spreading is exhibited on agar (growth extends several millimeters or more beyond the point of innoculation).
016369: Gelling agent (eg., agar) is required for growth.
017011: Growth at 0 C.
017012: Growth at 10 C.
017013: Growth at 15 C.
017014: Growth at 25 C.
017015: Growth at 37 C.
017032: Growth at 5 C.
017037: Growth at 20 C.
017045: Growth at 43 C.
018003: Growth in the presence of 0.5% NaCl.
018004: Growth in the presence of 3% NaCl.
018006: Growth in the presence of 5% NaCl.
018008: Growth in the presence of 10% NaCl.
018009: Growth in the presence of 15% NaCl.
018022: Growth in the presence of 7.5% NaCl.
018028: Added NaCl is required for growth.
019001: Sensitive to ampicillin concentration (disc) 2 ugm.
019021: Sensitive to bacitracin concentration (disc) 2 units.
019043: Sensitive to chloromycetin (chloramphenicol) concentration (disc) 5 ugm.
019044: Sensitive to chloromycetin (chloramphenicol) concentration (disc) 30 ugm.
019063: Sensitive to chlortetracycline (aureomycin) concentration (disc) 30 ugm.
019064: Sensitive to colistin concentration (disc) 2 ugm.
019065: Sensitive to colistin concentration (disc) 10 ugm.
019084: Sensitive to 2,4-diamino-6,7-diisopropylpteridine (0/129 vibriostat) crystals on agar.
019085: Sensitive to erythromycin (ilotycin) concentration (disc) 2 ugm.
019086: Sensitive to erythromycin (ilotycin) concentration (disc) 15 ugm.
019105: Sensitive to kanamycin concentration (disc) 5 ugm.
019106: Sensitive to kanamycin concentration (disc) 30 ugm.
019129: Sensitive to nalidixic acid concentration (disc) 30 ugm.
019148: Sensitive to neomycin (mycifradin) concentration (disc) 5 ugm.
019149: Sensitive to neomycin (mycifradin) concentration (disc) 30 ugm.
019168: Sensitive to nitrofurantoin concentration (disc) 100 ugm.
019169: Sensitive to nitrofurantoin concentration (disc) 300 ugm.
019188: Sensitive to novobiocin (albamycin) concentration (disc) 30 ugm.
019208: Sensitive to oxytetracycline (tetramycin, terramycin) concentration (disc) 30 ugm.
019210: Sensitive to penicillin G concentration (disc) 2 units.
019211: Sensitive to penicillin G concentration (disc) 10 units.
019230: Sensitive to polymyxin B (aerosporin) concentration (disc) 50 units.
019231: Sensitive to polymyxin B (aerosporin) concentration (disc) 300 units.
019233: Sensitive to streptomycin concentration (disc) 2.0 ugm.
019235: Sensitive to streptomycin concentration (disc) 10 ugm.
019274: Sensitive to tetracycline (achromycin) concentration (disc) 5 ugm.
019275: Sensitive to tetracycline (achromycin) concentration (disc) 30 ugm.
019294: Sensitive to triple sulfa (sulfadiazine/sulfamethazine/ sulfamerazine) concentration (disc) 1 mgm.
019297: Sensitive to vancocyn (vancomycin) concentration (disc) 30.0 ugm.
019374: Sensitive to gentamicin concentration (disc) 10 ugm.

019430: Sensitive to ampicillin concentration (disc) 10 ugm.
019484: Sensitive to chlortetracycline (aureomycin) concentration (disc) 5 ugm.
019486: Sensitive to novobiocin (albamycin) concentration (disc) 5 ugm.
020001: Colonies are pure (paper) white on solid medium.
020002: Colonies are gray on solid medium.
020007: Colonies luminescent in the dark.
020019: Diffusible (water-soluble) pigments are produced.
020020: Diffusible blue pigments are produced.
020021: Diffusible yellow pigments are produced.
020022: Diffusible green pigments are produced.
020023: Diffusible red pigments are produced.
020024: Diffusible orange pigments are produced.
020025: Diffusible violet (purple) pigments are produced.
020026: Diffusible brown pigments are produced.
020027: Diffusible black pigments are produced.
020038: Non-diffusible red pigments are produced.
020039: Non-diffusible brown pigments are produced.
020040: Non-diffusible green pigments are produced.
020041: Non-diffusible violet (purple) pigments are produced.
020042: Non-diffusible blue pigments are produced.
020043: Non-diffusible golden (yellow) pigments are produced.
020044: Non-diffusible orange pigments are produced.
020057: Non-diffusible black pigments are produced.
020058: Colonies fluoresce with short wavelength ultraviolet light (ca. 260 nm.).
020060: Fluorescent pigment observable with short wavelength ultraviolet light (ca. 260 nm.).
020080: Non-diffusible pigment occurs only in the center of the colony.
020081: Non-diffusible pigment occurs in concentric rings within the colony.
024004: Agar is hydrolyzed (liquefied).
024005: Carrageenin is degraded.
024007: Casein is hydrolyzed (peptonized).
024009: Gelatin is hydrolyzed (liquefied).
024011: Pectin is hydrolyzed.
024014: D-Glucose catabolized aerobically.
024015: D-Glucose catabolized anaerobically.
024114: Tryptophan yields indole.
024135: Ammonia is produced.
024138: Nitrate is reduced.
024139: Nitrate is reduced to nitrite.
024140: Nitrite is reduced to nitrogen gas.
024149: Thiosulfate is reduced to hydrogen sulfide.
024154: Hydrogen sulfide is produced from cysteine.
024164: Hydrogen peroxide is decomposed.
024185: Methyl red test is positive.
024191: Voges-Proskauer test positive (also see question 35).
024199: Sheep blood hemolysis is beta.
024210: Nitrite is reduced.
024212: L-Arginine utilization results in basic endproducts (medium becomes alkaline).
024248: Kovacs' oxidase test positive (smear from colony turns dark purple with tetramethylparaphenylenediamine dihydrochloride).
024251: Hydrogen sulfide is produced from peptones.
024448: Nitrite is reduced to nitrous oxide.
024449: Nitrate is reduced to nitric oxide.
025007: L-Arabinose is utilized.
025010: D-Ribose is utilized.
025012: D-Xylose is utilized.
025017: L-Rhamnose is utilized.

025019: D-Fructose is utilized.
025020: D-Galactose is utilized.
025021: D-Glucose is utilized (also see Section 24).
025022: D-Mannose is utilized.
025023: L-Sorbose is utilized.
025036: Salicin is utilized.
025037: Cellobiose is utilized.
025038: Lactose is utilized.
025039: Maltose is utilized.
025041: Sucrose is utilized.
025042: Trehalose is utilized.
025044: Raffinose is utilized.
025053: Alginic Acid is utilized.
025184: Acid produced from D-Ribose.
025193: Acid produced from D-Fructose.
025194: Acid produced from D-Galactose.
025195: Acid produced from D-Glucose (also see Section 24).
025196: Acid produced from D-Mannose.
025211: Acid produced from Cellobiose.
025212: Acid produced from Lactose.
025213: Acid produced from Maltose.
025215: Acid produced from Sucrose.
025216: Acid produced from Trehalose.
025242: Gas produced from D-Ribose.
025251: Gas produced from D-Fructose.
025252: Gas produced from D-Galactose.
025253: Gas produced from D-Glucose (also see Section 24).
025254: Gas produced from D-Mannose.
025269: Gas produced from Cellobiose.
025270: Gas produced from Lactose.
025271: Gas produced from Maltose.
025273: Gas produced from Sucrose.
025274: Gas produced from Trehalose.
025300: D-Ribose can be used as the sole source of carbon.
025309: D-Fructose can be used as the sole source of carbon.
025311: D-Glucose can be used as the sole source of carbon (also
025312: Mannose can serve as the sole source of carbon.
see Section 24).
025351: Cellulose is hydrolyzed.
025352: Chitin is hydrolyzed.
025357: Starch is hydrolyzed.
026002: Allyl Alcohol is utilized.
026003: 1-Butanol is utilized.
026005: Ethanol is utilized.
026014: 1-Propanol is utilized.
026015: 2-Propanol is utilized.
026039: D(-) 1,2-Propanediol is utilized.
026045: 1,2,3-Propanetriol (Glycerol) is utilized.
026052: D-Arabitol is utilized.
026057: Dulcitol is utilized.
026065: D-Mannitol is utilized.
026068: D-Sorbitol is utilized.
026075: Cyclohexanol is utilized.
026079: Meso-Inositol is utilized.
026089: Phenol is utilized.
026351: Acid is produced from 1,2,3-Propanetriol (Glycerol).
026363: Acid is produced from Dulcitol.
026371: Acid is produced from D-Mannitol.
026453: Gas is produced from 1,2,3-Propanetriol (Glycerol).
026465: Gas is produced from Dulcitol.
026473: Gas is produced from D-Mannitol.

026555: 1,2,3-Propanetriol (Glycerol) can be used as the sole source of carbon.
026625: 2-Phenylethanol is utilized.
026631: 1-Hexadecanol is utilized.
028002: Acetic acid is utilized.
028003: Butyric acid is utilized.
028004: Caproic acid is utilized.
028005: Caprylic acid is utilized.
028008: Isovaleric acid is utilized.
028009: Lauric acid is utilized.
028011: Palmitic acid is utilized.
028013: Propionic acid is utilized.
028016: Valeric acid (pentanoic acid) is utilized.
028021: Glutaric acid is utilized.
028022: Malonic acid is utilized.
028027: Succinic acid is utilized.
028037: Oleic acid is utilized.
028045: Fumaric acid is utilized.
028046: Itaconic acid is utilized.
028047: Maleic acid is utilized.
028052: DL-Glyceric acid is utilized.
028054: Beta-hydroxybutyric acid is utilized.
028057: DL-Lactic acid is utilized.
028061: Mucic acid is utilized.
028064: L(+) Tartaric acid is utilized.
028066: Citric acid is utilized.
028068: 2-Ketogluconic acid is utilized.
028071: Pyruvic acid is utilized.
028072: Alpha-ketoglutaric acid is utilized.
028078: Benzoic acid is utilized.
028079: Meta-Hydroxybenzoic acid is utilized.
028080: Para-Hydroxybenzoic acid is utilized.
028097: Ascorbic acid is utilized.
028099: Galacturonic acid is utilized.
028101: D-Gluconic acid is utilized.
028105: Ortho-Hydroxybenzoic acid is utilized.
028107: Saccharic acid acid is utilized.
028109: Acetic acid can be used as the sole source of carbon.
028134: Succinic acid can be used as the sole source of carbon.
028152: Fumaric acid can be used as the sole source of carbon.
028161: Beta-hydroxybutyric acid can be used as the sole source of carbon.
028164: DL-Lactic acid can be used as the sole source of carbon.
028178: Pyruvic acid can be used as the sole source of carbon.
028179: Alpha-ketoglutaric acid can be used as the sole source of carbon.
028208: D-Gluconic acid can be used as the sole source of carbon.
028662: Stearic acid is utilized.
028668: Cyclohexane carboxylic acid is utilized.
029003: L-Alanine is utilized.
029004: Beta-Alanine is utilized.
029008: Gamma-Aminobutyric Acid is utilized.
029013: L-Arginine is utilized.
029015: L-Asparagine is utilized.
029016: L-Aspartic Acid is utilized.
029017: Betaine is utilized.
029020: L-Cysteine is utilized.
029021: L-Cystine is utilized.
029023: L-Glutamic Acid is utilized.
029024: Glycine is utilized.
029025: Hippurate is utilized.

029026: L-Histidine is utilized.
029030: L-Leucine is utilized.
029032: L-Iso-Leucine is utilized.
029035: L-Lysine is utilized.
029036: L-Methionine is utilized.
029037: L-Ornithine is utilized.
029039: L-Phenylalanine is utilized.
029041: L-Proline is utilized.
029042: Sarcosine is utilized.
029044: L-Serine is utilized.
029045: L-Threonine is utilized.
029047: L-Tryptophan is utilized.
029049: L-Tyrosine is utilized.
029051: L-Valine is utilized.
029118: L-Aspartic Acid can be used as the sole source of carbon.
029125: L-Glutamic Acid can be used as the sole source of carbon.
029137: L-Lysine can be used as the sole source of carbon.
029149: L-Tryptophan can be used as the sole source of carbon.
029156: L-Alanine can be used as the sole source of nitrogen.
029166: L-Arginine can be used as the sole source of nitrogen.
029168: L-Asparagine can be used as the sole source of nitrogen.
029169: L-Aspartic Acid can be used as the sole source of nitrogen.
029173: L-Cysteine can be used as the sole source of nitrogen.
029174: L-Cystine can be used as the sole source of nitrogen.
029176: L-Glutamic Acid can be used as the sole source of nitrogen.
029177: Glycine can be used as the sole source of nitrogen.
029179: L-Histidine can be used as the sole source of nitrogen.
029183: L-Leucine can be used as the sole source of nitrogen.
029185: L-Iso-Leucine can be used as the sole source of nitrogen.
029188: L-Lysine can be used as the sole source of nitrogen.
029189: L-Methionine can be used as the sole source of nitrogen.
029192: L-Phenylalanine can be used as the sole source of nitrogen.
029194: L-Proline can be used as the sole source of nitrogen.
029197: L-Serine can be used as the sole source of nitrogen.
029198: L-Threonine can be used as the sole source of nitrogen.
029200: L-Tryptophan can be used as the sole source of nitrogen.
029202: L-Tyrosine can be used as the sole source of nitrogen.
029204: L-Valine can be used as the sole source of nitrogen.
029294: L-Phenylalanine is deaminated.
029302: L-Tryptophan is deaminated.
029319: L-Arginine is decarboxylated.
029341: L-Lysine is decarboxylated.
029343: L-Ornithine is decarboxylated.
029620: DL-Carnitine is utilized.
030003: Alpha-Amylamine is utilized.
030012: Ethanolamine is utilized.
030015: Histamine is utilized.
030025: Putrescine is utilized.
030028: Tryptamine is utilized.
030031: Allantoin is utilized.
030144: Ethanolamine can be used as the sole source of nitrogen.
030147: Histamine can be used as the sole source of nitrogen.
030162: Allantoin can be used as the sole source of nitrogen.
030377: N-Acetylglucoseamine is utilized.
030399: Guanine is utilized.
030401: Guanine can be used as the sole source of nitrogen.
030413: Thymine is utilized.
030415: Thymine can be used as the sole source of nitrogen.
030474: Taurine is utilized.
031093: Cyclohexanone can be used as the sole source of carbon.
031101: N-Decane is utilized.

031102: N-Docosane is utilized.
031103: N-Dodecane is utilized.
031104: N-Eicosane is utilized.
031106: N-Heptadecane is utilized.
031107: N-Heptane is utilized.
031108: N-Hexadecane is utilized.
031111: N-Nonadecane is utilized.
031112: N-Nonane is utilized.
031113: N-Octadecane is utilized.
031114: N-Octane is utilized.
031115: N-Pentadecane is utilized.
031118: N-Tetradecane is utilized.
031119: N-Tridecane is utilized.
031120: N-Undecane is utilized.
031127: 3-Methyl Hexane is utilized.
031136: Cyclohexane is utilized.
031137: Cis-Decalin is utilized.
031144: 1-Octadecene is utilized.
031158: Anthracene is utilized.
031160: N-Butylbenzene is utilized.
031161: P-Cymene is utilized.
031162: N-Dodecylbenzene is utilized.
031163: Ethylbenzene is utilized.
031165: 2-Methylnapththalene is utilized.
031166: 1-Methylnapththalene is utilized.
031169: Naphthalene is utilized.
031171: Phenanthrene is utilized.
031172: Omega-Phenyldecane is utilized.
031174: 3-Phenyleicosane is utilized.
031175: Omega-Phenyloctadecane is utilized.
031176: Pseudocumene is utilized.
031178: Toluene is utilized.
031179: Xylene is utilized.
031590: Pristane (2,6,10,14-Tetra-methylpentadecane) is utilized.
031602: Pentadecylcyclohexane is utilized.
031608: N-Triacontane is utilized.
031614: N-Dotriacontane is utilized.
031620: N-Hexatriacontane is utilized.
031626: 2-Methylbutane is utilized.
031632: 2,2,4-Trimethylpentane is utilized.
031638: 2,2,4,4,6,8,8-Heptamethylnonane is utilized.
031644: 2-Methylundecane is utilized.
031650: Methylcyclohexane is utilized.
031656: Methylcyclopentane is utilized.
031662: 1,2-Dimethylcyclohexane is utilized.
031668: 1,4-Dimethylcyclohexane is utilized.
031674: Ethylcyclohexane is utilized.
031680: Octylcyclohexane is utilized.
031686: Dicyclohexyl is utilized.
031692: 4-Tert Butylbenzene is utilized.
031698: 1,2,3,4-Tetramethylbenzene (prehnitene) is utilized.
031704: 1-Phenyltridecane is utilized.
031710: Diphenylmethane is utilized.
031716: 1,3,5-Triphenylbenzene is utilized.
031722: 2-Ethylnaphthalene is utilized.
031728: 2,3-Dimethylnaphthalene is utilized.
031734: 2,6-Dimethylnaphthalene is utilized.
031740: 1,2,3,4-Tetrahydronaphthalene is utilized.
031746: Acenaphthalene is utilized.
031752: 9-Methylanthracene is utilized.
031758: 1-Methylphenanthrene is utilized.

031764: N-Tetracosane is utilized.
031770: 1-Pentadecene is utilized.
031776: 2,2,4,6,6-Pentamethylheptane is utilized.
031782: 1-Phenylheptane is utilized.
031788: N-Octocosane is utilized.
031794: 2,2,4,6,6-Pentamethyl-3-heptene is utilized.
031800: 1-Phenyl-3,4 dihydronaphthalene is utilized.
031806: 1-Phenylnaphthalene is utilized.
031812: 1-Phenyl-1-cyclohexene is utilized.
031818: Chrysene (1,2-Benzphenanthrene) is utilized.
031824: Pyrene (Benzo-phenanthrene) is utilized.
031830: Triphenylene (9,10 Benzphenanthrene) is utilized.
031836: Isopropylcyclohexane is utilized.
032020: Tween 20 is hydrolyzed.
032023: Tween 80 is hydrolyzed.
034137: Alkaline phosphatase (3.1.3.1) is produced.
034143: Urease (3.5.1.5) is produced.
040331: Sensitive to oxytetracycline (tetramycin, terramycin) concentration (disc) 5 ugm.
098001: Non-diffusible pink pigments are produced.
098002: D-Ribose is utilized when yeast extract and amino acids are added.
098003: D-Glucose is utilized when yeast extract and amino acids are added.
098004: D-Fructose is utilized when yeast extract and amino acids are added.
098005: D-Gluconate is utilized when yeast extract and amino acids are added.
098006: Pyruvate is utilized when yeast extract and amino acids are added.
098007: Acetate is utilized when yeast extract and amino acids are added.
098008: Succinate is utilized when yeast extract and amino acids are added.
098009: Lactate is utilized when yeast extract and amino acids added.
098010: Alpha-Ketoglutarate is utilized when yeast extract and amino acids are added.
098011: Glycerol is utilized when yeast extract and amino acids are added.
098012: Beta-Hydroxybutyrate is utilized when yeast extract and amino acids are added.
098013: L-Aspartate is utilized when yeast extract and amino acids are added.
098014: L-Glutamate is utilized when yeast extract and amino acids ARE ADDED.
098015: L-Tryptophan is utilized when yeast extract and amino acids are utilized.
098016: L-Lysine is utilized when yeast extract and amino acids are utilized.
098017: Peptone is utilized.
098018: Proteose peptone #3 is utilized.
098019: Tryptone is utilized.
098020: Phytone is utilized.
098021: Peptone is utilized when yeast extract and amino acids are added.
098022: Proteose peptone #3 is utilized when yeast extract and amino acids are added.
098023: Tryptone is utilized when yeast extract and amino acids are utilized.
098024: Peptone can serve as sole source of carbon.

098025: Proteose peptone #3 can serve as sole source of carbon.
098026: Tryptone can sere as sole source of carbon.
098027: Unknown growth factors are required.
098028: Yeast extract plus amino acids plus vitamins serve as growth factors.
098029: Vitamins can serve as growth factor.

Table IV

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Table V

NUTRIENT ANALYSES

SAMPLE NO.	PO4-P	NH3-N	NO3-N	SIO2-SI
*GW0119?03	05.95	02.2	08.5	013.0
*GW0124?03	07.82	02.2	07.8	009.0
*GW0133?03	06.52	06.7	05.9	014.0
*GW0137?03	07.30	02.3	07.9	010.0
*GW0145?03	07.30	01.4	06.0	009.0
*GW0148?03	07.93	02.2	05.9	008.0
*GW0156?03	07.72	01.2	07.1	010.0
*GW0159?03	08.49	02.7	07.1	010.0

Table VI

DIRECT COUNT

WATER	COUNT
*GW0101?04	1.2E5
*GW0102?04	3.0E5
*GW0103?04	1.4E5
*GW0104?04	4.3E5
*GW0105?04	3.8E5
*GW0106?04	1.8E5
*GW0119?04	3.6E5
*GW0124?04	3.3E5
*GW0133?04	3.8E5
*GW0137?04	1.0E5
*GW0145?04	2.8E5
*GW0148?04	2.1E5
*GW0156?04	5.0E5
*GW0159?04	4.7E5

SEDIMENT	
*GB0101?04	—
*GB0121?04	—
*GB0134?04	—
*GB0137?04	—
*GB0146?04	—
*GB0148?04	—

Table VII

AEROBIC HETEROTROPHIC PSYCHROPHILES AND PSYCHROTROPHS

WATER	COUNT	CONDITIONS
*GW0101?05	5.5E1	04C AEROBIC S MARINE 2216
*GW0102?05	5.0E1	04C AEROBIC S MARINE 2216
*GW0103?05	2.0E1	04C AEROBIC S MARINE 2216
*GW0104?05	5.0E1	04C AEROBIC S MARINE 2216
*GW0105?05	6.0E1	04C AEROBIC S MARINE 2216
*GW0106?05	6.5E1	04C AEROBIC S MARINE 2216
*GW0119?05	3.5E1	04C AEROBIC S MARINE 2216
*GW0124?05	9.7E1	04C AEROBIC S MARINE 2216
*GW0133?05	9.2E1	04C AEROBIC S MARINE 2216
*GW0137?05	1.2E2	04C AEROBIC S MARINE 2216
*GW0145?05	1.3E2	04C AEROBIC S MARINE 2216
*GW0148?05	1.9E2	04C AEROBIC S MARINE 2216
*GW0156?05	2.5E2	04C AEROBIC S MARINE 2216
*GW0159?05	2.2E2	04C AEROBIC S MARINE 2216
SEDIMENT		
*GB0101?05	1.0E4	04C AEROBIC S MARINE 2216
*GB0121?05	1.1E6	04C AEROBIC S MARINE 2216
*GB0134?05	1.4E6	04C AEROBIC S MARINE 2216
*GB0137?05	6.2E5	04C AEROBIC S MARINE 2216
*GB0146?05	—	04C AEROBIC S MARINE 2216
*GB0148?05	2.0E4	04C AEROBIC S MARINE 2216

Table VIII

AEROBIC HETEROTROPHIC MESOPHILES

WATER	COUNT	CONDITIONS
*GW0101?06	—	20C AEROBIC S MARINE 2216
*GW0102?06	—	20C AEROBIC S MARINE 2216
*GW0103?06	—	20C AEROBIC S MARINE 2216
*GW0104?06	—	20C AEROBIC S MARINE 2216
*GW0105?06	—	20C AEROBIC S MARINE 2216
*GW0106?06	—	20C AEROBIC S MARINE 2216
*GW0119?06	4.3E1	20C AEROBIC S MARINE 2216
*GW0124?06	8.0E1	20C AEROBIC S MARINE 2216
*GW0133?06	1.1E2	20C AEROBIC S MARINE 2216
*GW0137?06	—	20C AEROBIC S MARINE 2216
*GW0145?06	3.1E2	20C AEROBIC S MARINE 2216
*GW0148?06	5.7E2	20C AEROBIC S MARINE 2216
*GW0156?06	2.0E3	20C AEROBIC S MARINE 2216
*GW0159?06	5.6E2	20C AEROBIC S MARINE 2216

SEDIMENT		
*GB0101?06	—	20C AEROBIC S MARINE 2216
*GB0121?06	8.4E5	20C AEROBIC S MARINE 2216
*GB0134?06	1.2E6	20C AEROBIC S MARINE 2216
*GB0137?06	3.5E5	20C AEROBIC S MARINE 2216
*GB0146?06	—	20C AEROBIC S MARINE 2216
*GB0148?06	—	20C AEROBIC S MARINE 2216

Table IX

AEROBIC HETEROTROPHIC PSYCHROPHILES AND PSYCHROTROPHS

WATER	COUNT	CONDITIONS
*GW0101?07	—	04C AEROBIC S MSWYE
*GW0102?07	—	04C AEROBIC S MSWYE
*GW0103?07	—	04C AEROBIC S MSWYE
*GW0104?07	—	04C AEROBIC S MSWYE
*GW0105?07	—	04C AEROBIC S MSWYE
*GW0106?07	—	04C AEROBIC S MSWYE
*GW0119?07	—	04C AEROBIC S MSWYE
*GW0124?07	—	04C AEROBIC S MSWYE
*GW0133?07	—	04C AEROBIC S MSWYE
*GW0137?07	—	04C AEROBIC S MSWYE
*GW0145?07	3.0E1	04C AEROBIC S MSWYE
*GW0148?07	5.0E1	04C AEROBIC S MSWYE
*GW0156?07	7.0E1	04C AEROBIC S MSWYE
*GW0159?07	5.0E1	04C AEROBIC S MSWYE
SEDIMENT		
*GB0101?07	—	04C AEROBIC S MSWYE
*GB0121?07	—	04C AEROBIC S MSWYE
*GB0134?07	—	04C AEROBIC S MSWYE
*GB0137?07	7.3E3	04C AEROBIC S MSWYE
*GB0146?07	—	04C AEROBIC S MSWYE
*GB0148?07	2.5E4	04C AEROBIC S MSWYE

Table X

AEROBIC HETEROTROPHIC MESOPHILES

WATER	COUNT	CONDITIONS
*GW0101?08	—	20C AEROBIC S MSWYE
*GW0102?08	—	20C AEROBIC S MSWYE
*GW0103?08	—	20C AEROBIC S MSWYE
*GW0104?08	—	20C AEROBIC S MSWYE
*GW0105?08	—	20C AEROBIC S MSWYE
*GW0106?08	—	20C AEROBIC S MSWYE
*GW0119?08	—	20C AEROBIC S MSWYE
*GW0124?08	—	20C AEROBIC S MSWYE
*GW0133?08	—	20C AEROBIC S MSWYE
*GW0137?08	5.0E5	20C AEROBIC S MSWYE
*GW0145?08	2.0E2	20C AEROBIC S MSWYE
*GW0148?08	2.0E2	20C AEROBIC S MSWYE
*GW0156?08	5.0E2	20C AEROBIC S MSWYE
*GW0159?08	2.0E1	20C AEROBIC S MSWYE

SEDIMENT	COUNT	CONDITIONS
*GB0101?08	—	20C AEROBIC S MSWYE
*GB0121?08	—	20C AEROBIC S MSWYE
*GB0134?08	—	20C AEROBIC S MSWYE
*GB0137?08	2.3E4	20C AEROBIC S MSWYE
*GB0146?08	—	20C AEROBIC S MSWYE
*GB0148?08	—	20C AEROBIC S MSWYE

Table XI

PSYCHROPHILIC AND PSYCHROTROPHIC "FUNGI"

WATER	COUNT	CONDITIONS			
*GW0101?215	<1.0E0	04C	AEROBIC	M	SDA
*GW0102?215	—	04C	AEROBIC	M	SDA
*GW0103?215	—	04C	AEROBIC	M	SDA
*GW0104?215	—	04C	AEROBIC	M	SDA
*GW0105?215	—	04C	AEROBIC	M	SDA
*GW0106?215	—	04C	AEROBIC	M	SDA
*GW0119?215	1.0E0	04C	AEROBIC	M	SDA
*GW0124?215	8.7E0	04C	AEROBIC	M	SDA
*GW0133?215	1.3E1	04C	AEROBIC	M	SDA
*GW0137?215	4.0E0	04C	AEROBIC	M	SDA
*GW0145?215	2.0E0	04C	AEROBIC	M	SDA
*GW0148?215	<1.0E0	04C	AEROBIC	M	SDA
*GW0156?215	<1.0E0	04C	AEROBIC	M	SDA
*GW0159?215	<1.0E0	04C	AEROBIC	M	SDA
SEDIMENT					
*GB0101?215	3.5E2	04C	AEROBIC	S	SDA
*GB0121?215	2.6E4	04C	AEROBIC	S	SDA
*GB0134?215	2.6E4	04C	AEROBIC	S	SDA
*GB0137?215	6.5E3	04C	AEROBIC	S	SDA
*GB0146?215	—	04C	AEROBIC	S	SDA
*GB0148?215	9.8E3	04C	AEROBIC	S	SDA

Table XII

MESOPHILIC "FUNGI"

WATER	COUNT	CONDITIONS
*GW0101?216	—	20C AEROBIC M SDA
*GW0102?216	—	20C AEROBIC M SDA
*GW0103?216	—	20C AEROBIC M SDA
*GW0104?216	—	20C AEROBIC M SDA
*GW0105?216	—	20C AEROBIC M SDA
*GW0106?216	—	20C AEROBIC M SDA
*GW0119?216	7.0E0	20C AEROBIC M SDA
*GW0124?216	1.2E1	20C AEROBIC M SDA
*GW0133?216	7.0E0	20C AEROBIC M SDA
*GW0137?216	1.2E0	20C AEROBIC M SDA
*GW0145?216	1.6E1	20C AEROBIC M SDA
*GW0148?216	2.0E0	20C AEROBIC M SDA
*GW0156?216	—	20C AEROBIC M SDA
*GW0159?216	1.0E1	20C AEROBIC M SDA
SEDIMENT		
*GB0101?216	—	20C AEROBIC S SDA
*GB0121?216	1.5E4	20C AEROBIC S SDA
*GB0134?216	3.1E1	20C AEROBIC S SDA
*GB0137?216	—	20C AEROBIC S SDA
*GB0143?216	—	20C AEROBIC S SDA
*GB0148?216	—	20C AEROBIC S SDA

Table XIII

"PSEUDOMONADS"

WATER	COUNT	CONDITIONS
*GW0101?12	—	20C AEROBIC M PSEUDOSEL
*GW0102?12	—	20C AEROBIC M PSEUDOSEL
*GW0103?12	—	20C AEROBIC M PSEUDOSEL
*GW0104?12	—	20C AEROBIC M PSEUDOSEL
*GW0105?12	—	20C AEROBIC M PSEUDOSEL
*GW0106?12	—	20C AEROBIC M PSEUDOSEL
*GW0119?12	<1.0E-1	20C AEROBIC M PSEUDOSEL
*GW0124?12	<1.0E-1	20C AEROBIC M PSEUDOSEL
*GW0133?12	<1.0E-1	20C AEROBIC M PSEUDOSEL
*GW0137?12	<1.0E-1	20C AEROBIC M PSEUDOSEL
*GW0145?12	<1.0E-1	20C AEROBIC M PSEUDOSEL
*GW0148?12	<1.0E-1	20C AEROBIC M PSEUDOSEL
*GW0156?12	<1.0E-1	20C AEROBIC M PSEUDOSEL
*GW0159?12	<1.0E-1	20C AEROBIC M PSEUDOSEL

SEDIMENT		
*GB0101?12	—	20C AEROBIC M PSEUDOSEL
*GB0121?12	<1.0E2	20C AEROBIC M PSEUDOSEL
*GB0134?12	<1.0E2	20C AEROBIC M PSEUDOSEL
*GB0137?12	<1.0E2	20C AEROBIC M PSEUDOSEL
*GB0146?12	—	20C AEROBIC M PSEUDOSEL
*GB0148?12	—	20C AEROBIC M PSEUDOSEL

Table XIV

SALMONELLA-SHIGELLA

WATER	COUNT	CONDITIONS
*GW0101?11	—	20C AEROBIC M SS
*GW0102?11	—	20C AEROBIC M SS
*GW0103?11	—	20C AEROBIC M SS
*GW0104?11	—	20C AEROBIC M SS
*GW0105?11	—	20C AEROBIC M SS
*GW0106?11	—	20C AEROBIC M SS
*GW0119?11	1.0E0	20C AEROBIC M SS
*GW0124?11	<1.0E-1	20C AEROBIC M SS
*GW0133?11	<1.0E-1	20C AEROBIC M SS
*GW0137?11	<1.0E-1	20C AEROBIC M SS
*GW0145?11	0.2E0	20C AEROBIC M SS
*GW0148?11	<1.0E-1	20C AEROBIC M SS
*GW0156?11	0.8E0	20C AEROBIC M SS
*GW0159?11	1.0E0	20C AEROBIC M SS

SEDIMENT		
*GB0101?11	—	20C AEROBIC M SS
*GB0121?11	<1.0E2	20C AEROBIC M SS
*GB0134?11	<1.0E2	20C AEROBIC M SS
*GB0137?11	<1.0E2	20C AEROBIC M SS
*GB0146?11	—	20C AEROBIC M SS
*GB0148?11	—	20C AEROBIC M SS

Table XV

"ENTERIC BACTERIA"

WATER	COUNT	CONDITIONS
*GW0101?217	—	20C AERCBIC M EMB
*GW0102?217	—	20C AEROBIC M EMB
*GW0103?217	—	20C AERCBIC M EMB
*GW0104?217	—	20C AERCBIC M EMB
*GW0105?217	—	20C AERCBIC M EMB
*GW0106?217	—	20C AERCBIC M EMB
*GW0119?217	<1.0E-1	20C AEROBIC M EMB
*GW0124?217	<1.0E-1	20C AERCBIC M EMB
*GW0133?217	1.0E0	20C AERCBIC M EMB
*GW0137?217	<1.0E-1	20C AERCBIC M EMB
*GW0145?217	2.0E0	20C AERCBIC M EMB
*GW0148?217	1.3E1	20C AERCBIC M EMB
*GW0156?217	<1.0E-1	20C AERCBIC M EMB
*GW0159?217	<1.0E-1	20C AERCBIC M EMB
SEDIMENT		
*GB0101?217	—	20C AEROBIC M EMB
*GB0121?217	<1.0E2	20C AERCBIC M EMB
*GB0134?217	<1.0E2	20C AEROBIC M EMB
*GB0137?217	<1.0E2	20C AERCBIC M EMB
*GB0146?217	—	20C AERCBIC M EMB
*GB0148?217	—	20C AERCBIC M EMB

Table XVI

"VIBRIO" MESOPHILES

WATER	COUNT	CONDITIONS
*GW0101?10	—	20C AEROBIC M TCBS
*GW0102?10	—	20C AEROBIC M TCBS
*GW0103?10	—	20C AEROBIC M TCBS
*GW0104?10	—	20C AEROBIC M TCBS
*GW0105?10	—	20C AEROBIC M TCBS
*GW0106?10	—	20C AEROBIC M TCBS
*GW0119?10	1.5E1	20C AEROBIC M TCBS
*GW0124?10	1.2E1	20C AEROBIC M TCBS
*GW0133?10	4.0E0	20C AEROBIC M TCBS
*GW0137?10	5.4E0	20C AEROBIC M TCBS
*GW0145?10	8.7E0	20C AEROBIC M TCBS
*GW0148?10	4.9E0	20C AEROBIC M TCBS
*GW0156?10	1.0E1	20C AEROBIC M TCBS
*GW0159?10	0.9E0	20C AEROBIC M TCBS
SEDIMENT		
*GB0101?10	—	20C AEROBIC M TCBS
*GB0121?10	4.0E4	20C AEROBIC M TCBS
*GB0134?10	4.2E4	20C AEROBIC M TCBS
*GB0137?10	2.4E3	20C AEROBIC M TCBS
*GB0146?10	—	20C AEROBIC M TCBS
*GB0148?10	—	20C AEROBIC M TCBS

Table XVII

OIL UTILIZING PSYCHROPHILES AND PSYCHROTROPHS

WATER	COUNT	CONDITIONS
*GW0101?13	<1.0E-1	04C AEROBIC M OIL
*GW0102?13	—	04C AEROBIC M OIL
*GW0103?13	—	04C AEROBIC M OIL
*GW0104?13	—	04C AEROBIC M OIL
*GW0105?13	—	04C AEROBIC M OIL
*GW0106?13	—	04C AEROBIC M OIL
*GW0119?13	0.5E0	04C AEROBIC M OIL
*GW0124?13	1.5E1	04C AEROBIC M OIL
*GW0133?13	<1.0E-1	04C AEROBIC M OIL
*GW0137?13	<1.0E-1	04C AEROBIC M OIL
*GW0145?13	<1.0E0	04C AEROBIC M OIL
*GW0148?13	<1.0E0	04C AEROBIC M OIL
*GW0156?13	0.5E0	04C AEROBIC M OIL
*GW0159?13	0.1E0	04C AEROBIC M OIL
SEDIMENT		
*GB0101?13	<1.0E2	04C AEROBIC S OIL
*GB0121?13	<1.0E2	04C AEROBIC S OIL
*GB0134?13	<1.0E2	04C AEROBIC S OIL
*GB0137?13	<1.0E2	04C AEROBIC S OIL
*GB0146?13	—	04C AEROBIC S OIL
*GB0148?13	<1.0E2	04C AEROBIC S OIL

Table XVIII

OIL UTILIZING MESOPHILES

WATER	COUNT	CONDITIONS
*GW0101?14	—	20C AEROBIC M OIL
*GW0102?14	—	20C AEROBIC M OIL
*GW0103?14	—	20C AEROBIC M OIL
*GW0104?14	—	20C AEROBIC M OIL
*GW0105?14	—	20C AEROBIC M OIL
*GW0106?14	—	20C AEROBIC M OIL
*GW0119?14	<1.0E-1	20C AEROBIC M OIL
*GW0124?14	1.0E0	20C AEROBIC M OIL
*GW0133?14	<1.0E-1	20C AEROBIC M OIL
*GW0137?14	<1.0E-1	20C AEROBIC M OIL
*GW0145?14	<1.0E-1	20C AEROBIC M OIL
*GW0148?14	<1.0E-1	20C AEROBIC M OIL
*GW0156?14	<1.0E-1	20C AEROBIC M OIL
*GW0159?14	—	20C AEROBIC M OIL

SEDIMENT	COUNT	CONDITIONS
*GB0101?14	—	20C AEROBIC S OIL
*GB0121?14	<1.0E2	20C AEROBIC S OIL
*GB0134?14	<1.0E0	20C AEROBIC S OIL
*GB0137?14	—	20C AEROBIC S OIL
*GB0146?14	—	20C AEROBIC S OIL
*GB0148?14	—	20C AEROBIC S OIL

Table XIX

PLATE COUNTS

Type of Crab	Area of Collection	Organisms/gram tissue wet wt.							
		Marine Agar		TCBS (Vibrio)		McConkey's		Anaerobic Marine Agar	
		Muscle	Gill	Muscle	Gill	Muscle	Gill	Muscle	Gill
Dungeness	Chiniak Bay	~400	1.66×10^5	<50	$<10^3$	<50	$<10^3$	<50	<50
Tanner	Chiniak Bay (1)	<50	1.7×10^4	<50	$<10^3$	<50	$<10^3$	<50	2.5×10^4
	(2)	<50	4.3×10^4	<50	$<10^3$	<50	$<10^3$	<50	1.2×10^3
	Bering Sea (1)	<50	$<10^3$	<50	$<10^3$	<50	$<10^3$	<50	5.5×10^2
	(2)	<50	$<10^3$	<50	$<10^3$	<50	$<10^3$	<50	<50
	Ugak Bay (1)	<50	6.0×10^3	<50	$<10^3$	<50	$<10^3$	<50	9.0×10^2
	(2)	<50	5.2×10^4	<50	$<10^3$	<50	$<10^3$	3.8×10^3	3.6×10^4

Table XX

Number of Isolants

	20C		4C		Total
	Water	Sediment	Water	Sediment	
TOTAL ISOLATED	60	49	73	24	206
Gram Positive	4	2	4	0	10
Gram Negative	49	38	67	24	178
Coccoid-shaped	2	1	0	0	3
Rod-shaped	49	40	68	24	181
Non-motile	23	25	15	8	71
Motile	31	18	56	16	121

Table XXI

PERCENTAGE OF ORGANISMS TESTED

	Gram+	Gram−	Coccoid	Rod	Non-motile	Motile
Total 20C Isolants	6.5	93.5	3.2	96.8	49.5	50.5
Total 4C Isolants	4.2	95.8	0	100.0	24.2	75.8
Total Water Isolants	6.5	93.5	1.7	98.3	30.4	69.6
Total Sediment Isolants	3.1	96.9	1.5	98.5	47.6	52.4
TOTAL ORGANISMS	5.3	94.7	1.6	98.4	37.0	63.0

Table XXII

ACID FAST STAINS

```
FORM NUMBER =100190
    1   G000076       GULF OF ALASKA WATER 20C STATION133
    2   G000082       GULF OF ALASKA WATER 20C STATION133
    3   G000083       GULF OF ALASKA WATER 20C STATION133
    4   G000094       GULF OF ALASKA WATER 20C STATION133
    5   G000152       GULF OF ALASKA WATER 20C STATION148
    6   G000582       GULF OF ALASKA WATER 04C STATION124

END FORM                           100190
     6 STRAINS
```

Table XXIII

GRAM POSITIVE STAINS

FORM NUMBER =100190

1	G000086	GULF OF ALASKA WATER 20C STATION133
2	G000087	GULF OF ALASKA WATER 20C STATION133
3	G000152	GULF OF ALASKA WATER 20C STATION148
4	G000212	GULF OF ALASKA WATER 20C STATION159
5	G000258	GULF OF ALASKA SEDIMENT 20C STATION121
6	G000278	GULF OF ALASKA SEDIMENT 20C STATION134
7	G000527	GULF OF ALASKA WATER 04C STATION106
8	G000577	GULF OF ALASKA WATER 04C STATION124
9	G000582	GULF OF ALASKA WATER 04C STATION124
10	G000681	GULF OF ALASKA WATER 04C STATION148

END FORM 100190

10 STRAINS

Table XXIV

Microorganisms isolated from: DUNGENESS CRABS

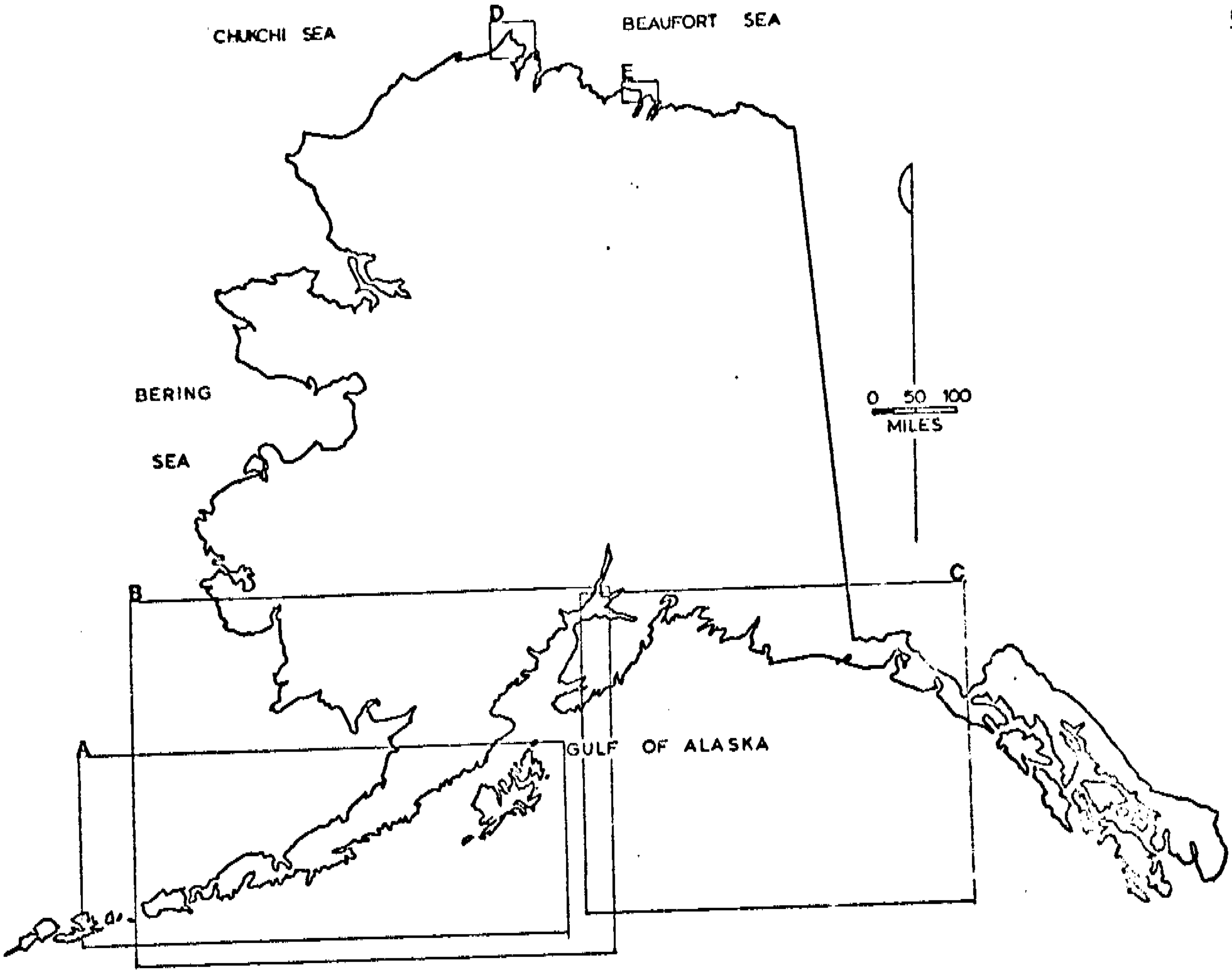
Gill	Muscle
Acinetobacter calcoaceticus *Pseudomonas maltophilia* *Pseudomonas fluorescens* Group D *streptococcus*, including one isolate - *Enterococcus* *Enterobacter agglomerans* *Citrobacter freundii* *Klebsiella pneumoniae*, possibly *K. ozonae* *Aeromonas hydroxyla* *Staphylococcus epidermidis* (Coag. neg.) *Sarcina* spp. *Yersinia enterolitica* *Alcaligenes* spp. *Moraxella* spp. *Pasteurella* spp.	*Staphylococcus epidermidis* *Sarcina* spp. Group D *streptococcus* *Pseudomonas* spp. *Alcaligenes* spp. *Moraxella* spp. *Pasteurella* spp. *Acinetobacter calcoaceticus* *Micrococcus* spp.

Table XXV

Microorganisms isolated from: TANNER CRABS

Gill	Muscle	Eggs
Staphylococcus epidermidis *Micrococcus* spp. *Alcaligenes* spp. *Moraxella* spp. *Acinetobacter calcoaceticus*	*Staphylococcus epidermidis* *Micrococcus* spp.	*Staphylococcus epidermidis* *Micrococcus* spp. *Sarcina* spp. *Alcaligenes* spp. *Acinetobacter calcoaceticus* *Pseudomonas fluorescens*

Fig. 1 Map showing sampling locations for water and sediment samples.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BEAUFORT SEA
D
E
BERING
SEA
0 50 100
MILES
B
C
A
GULF OF ALASKA

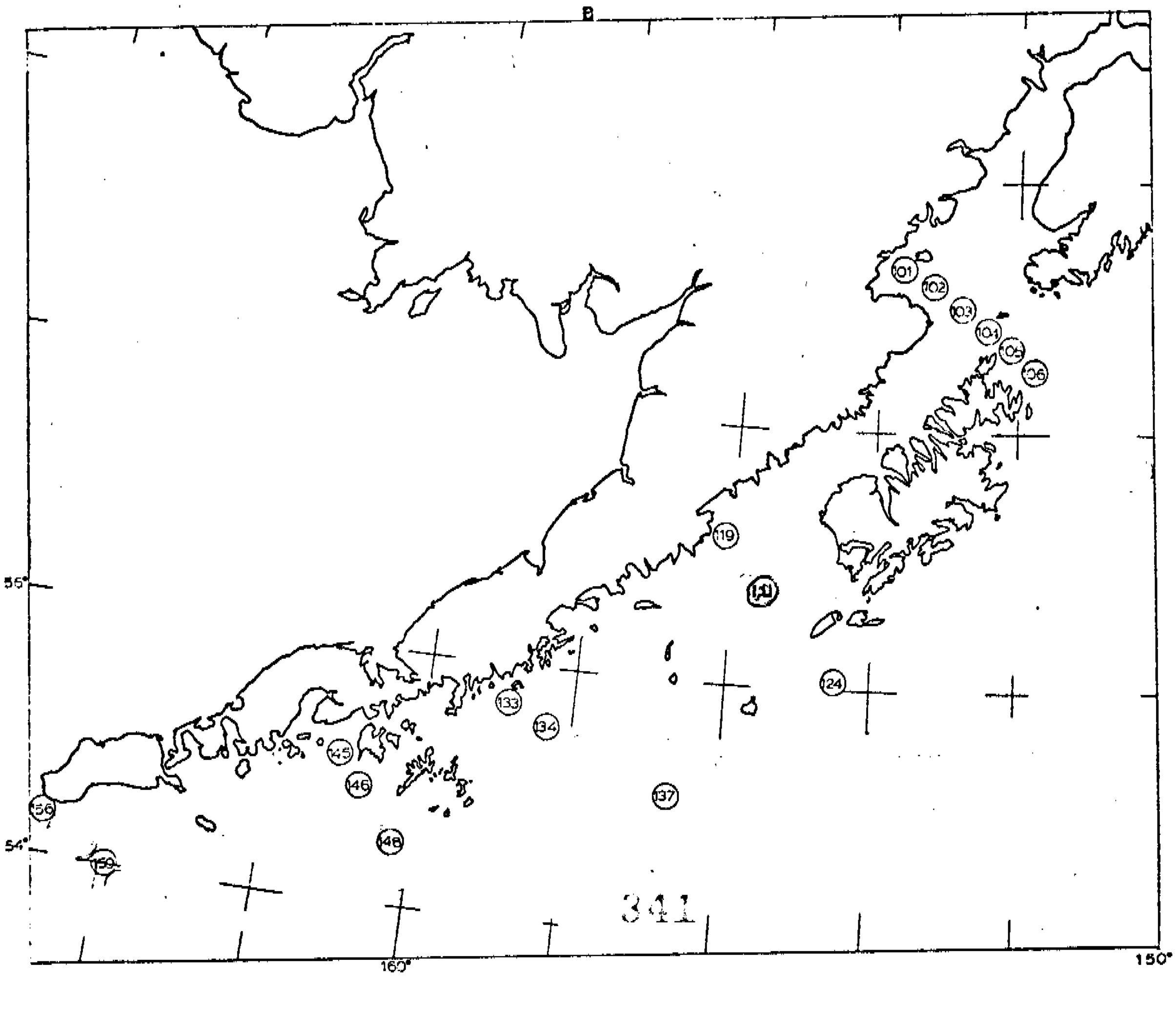
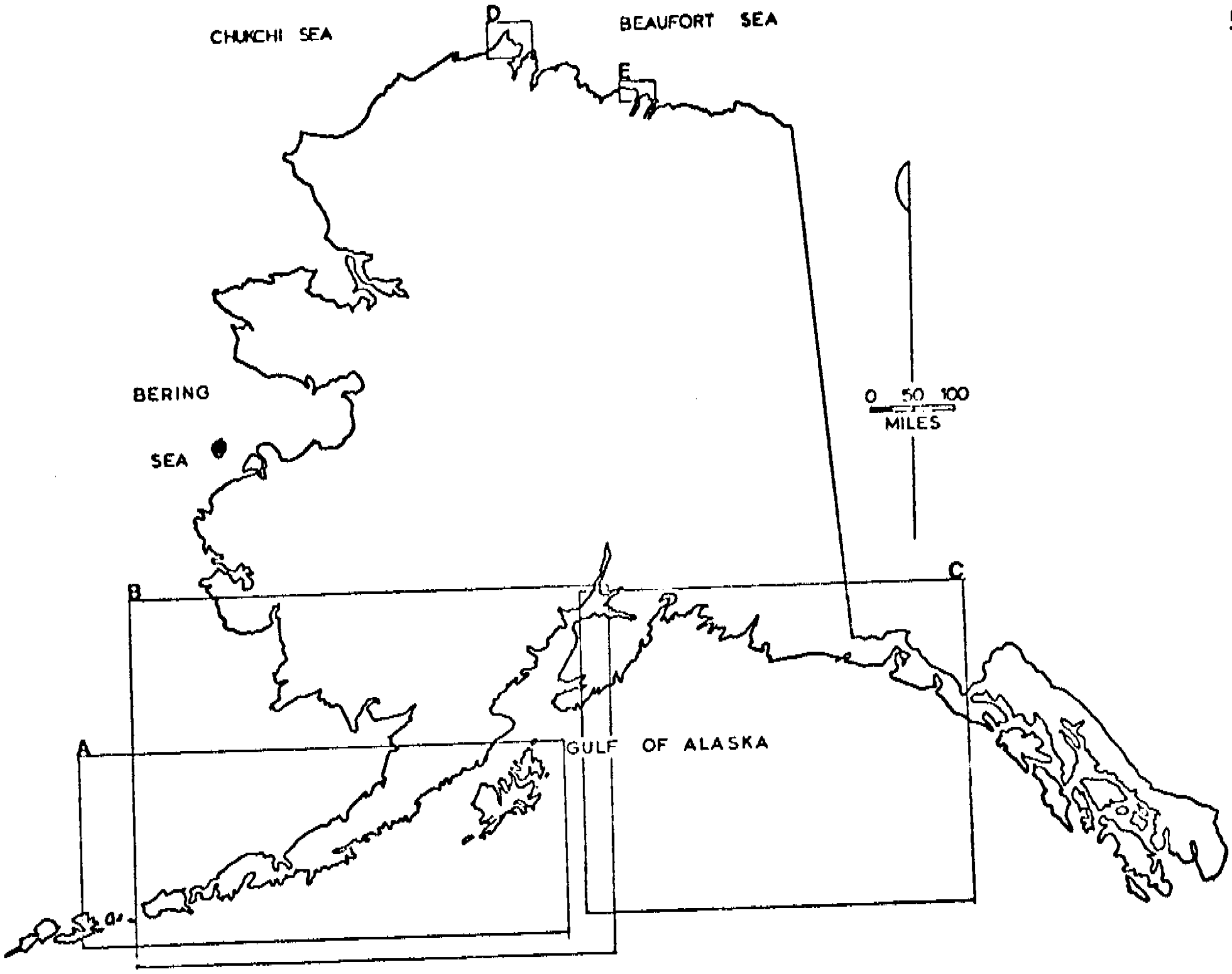

B
101
102
103
104
105
106
119
124
133
134
137
145
146
148
156
159
55°
54°
160°
150°

Fig. 2 Map showing locations for crab collections.

a. Bering Sea
b. Ugak Bay
c. Chiniak Bay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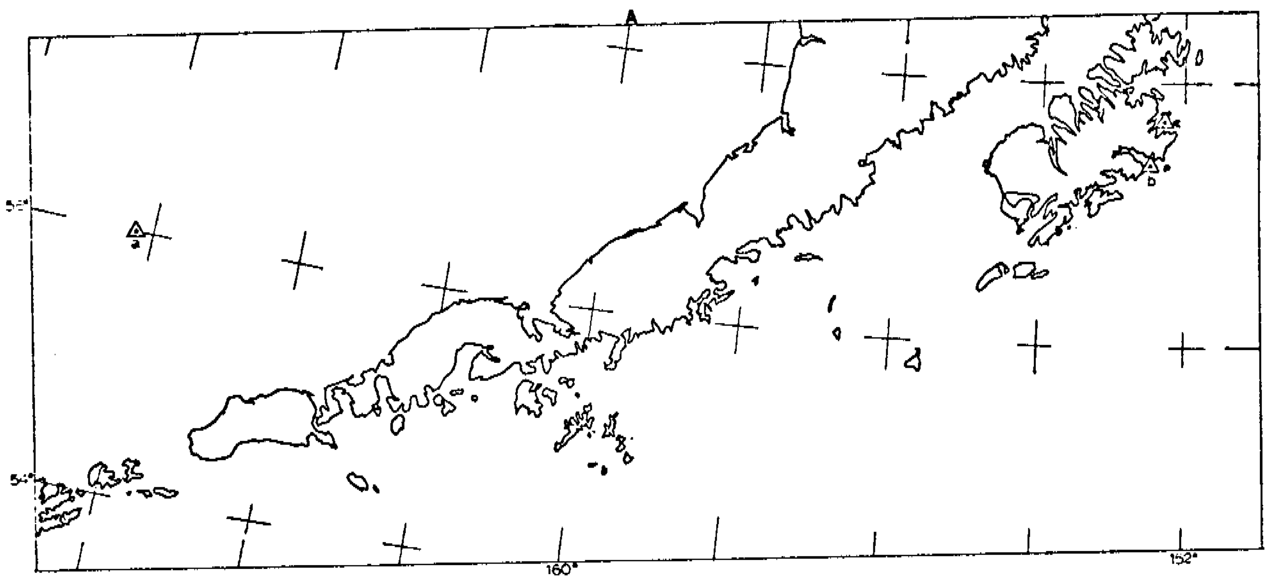
D
BEAUFORT SEA
E
BERING
SEA
0 50 100
MILES
B
C
A
GULF OF ALASKA


A
160°
152°

Future Work

During the remainder of the contract two more cruises are scheduled aboard the Discoverer for sampling. One of these cruises is presently in the northeast Gulf of Alaska. Additionally, beach samples are being collected. These samples will be processed for enumeration of microorganisms and compared to the previous samples. Microorganisms will be isolated from these samples for taxonomic characterization. It is anticipated that taxonomic characterization should be completed on microorganisms isolated from the October cruise as well as the April cruise by October 1976. Isolants from the August 1976 cruise will not be completed by that date.

Crab samples will continue to be examined for analysis of potential pathogens. Additionally, some clam and salmon specimens should be received for analysis.

As planned, assays will be made during the forthcoming cruises for rates of hydrocarbon biodegradation and bioemulsification. Assay should be completed by October. A complete proposal for future work during a second contract year is being prepared.

ANNUAL REPORT

Contract #01-6-022-11469
Research Unit #43/44/45

Reporting Period
July 1, 1975 - March 15, 1976
34 Pages

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I. SUMMARY OF OBJECTIVES, CONCLUSIONS AND IMPLICATIONS WITH RESPECT TO OCS OIL AND GAS DEVELOPMENT

The objectives of this study are to assure the quality of the chemical data reported to NOAA and to develop accurate and precise methods for chemical analysis of the marine environment. Specific conclusions can be found in the body of this report. Of maximum interest is the development of new liquid chromatographic procedures which enhance both the selectivity and sensitivity of analysis of hydrocarbons in biological tissue samples and polynuclear aromatic hydrocarbons in all matrices. The first sediment intercalibration study, while small in scope, nevertheless shows the advantages of such studies.

II. INTRODUCTION

A. General Nature and Scope of Study

1) Quality assurance program for trace hydrocarbon analysis
2) Methods development for analysis of individual high molecular weight aromatic hydrocarbons by LC-fluorescence techniques
3) Methods development for trace hydrocarbon analysis in the sea ice and at the sea ice-water interface

B. Specific Objectives

The objectives of the proposed research are 1) to serve as a quality assurance laboratory for hydrocarbon analysis in sediments, tissue and water, 2) to develop methodology for identification and quantitation of individual 3-, 4-, 5-, and 6-condensed ring aromatic hydrocarbons at ng/kg (part per trillion) levels; 3) to develop methodology for sampling the sea ice-water interface and analyzing it for its organic content; and 4) to continue methodology development for the determination of trace hydrocarbons in marine tissue.

C. Relevance to Problems of Petroleum Development

With the large number of environmental analyses being performed, the need for quality assurance (i.e., accurate and precise measurements) is great. Clearly, accuracy is far more difficult and costly to achieve than precision, and indeed, even precision is not easily achieved on an interlaboratory scale. Until such time as standard reference materials are available, a quality control function is essential to assure the comparability of numbers obtained by different laboratories.

With increasing petroleum development, serious consideration must be given to the presence of toxic polynuclear aromatic hydrocarbons arising from petroleum in the marine environment. In order to assess the biological effect of these molecules it is first necessary to develop chemical methodology for their analyses at very low levels (ng/kg). The liquid chromatographic (LC) technique described in this report permits ng/kg (ppt) analyses.

The NOAA task of primary emphasis in this research is:

A-33--Determination of total content and chemical species of hydrocarbons in the water column, in selected marine organisms, in sea ice and in the sea ice-water interface.

The results of the proposed research could have secondary influence on the following NOAA tasks:

A-31--Determine the relationship of living resources to the ice environment.

B-8--Examine the processes which determine the fate of hydrocarbons introduced into the environment.

B-14--Develop means to predict possible interactions between ice and oil and other contaminant discharges.

III. CURRENT STATE OF KNOWLEDGE

Due to the unavailability of standard reference materials and the lack of intercalibration samples no concerted laboratory intercomparison program exists to date. Current methodologies for determination of hydrocarbons in marine tissues and polynuclear aromatic hydrocarbons are not sensitive enough for the Gulf of Alaska study.

IV. STUDY AREAS

A. Gulf of Alaska
B. Bering Sea

V. SOURCE METHODS AND RATIONALE OF DATA COLLECTION

N/A

VI-VII. RESULTS AND DISCUSSION

Technical Note 889 titled "Trace Hydrocarbon Analysis: National Bureau of Standards Prince William Sound/ Northeastern Gulf of Alaska Baseline Study" has been released. This technical note describes in detail the NBS procedures for hydrocarbon analysis of the marine ecosystem and presents partial results of the baseline study. A less detailed, but complete, summary of the methodology was recently published in the Journal of Chromatographic Science. Copies of these two publications are appended to this annual report.

The hydrocarbon content (including polynuclear aromatic hydrocarbons [PAH's]) in water samples collected in spring 1975 were reported for all the baseline sites. Results were also reported for sediment samples collected in spring 1975 and water samples collected jointly with Dr. D. Shaw in October 1975. The tabulated data and a detailed discussion of these results are contained in the December 1975 semi-annual report.

Several new methods of analysis are reported below in the summary of fourth quarter operations. A procedure has been developed for the sensitive determination ($\geq$ 1 ng) of PAH's. This technique utilizes liquid chromatography with both UV and fluorescence detection. Progress has been made in optimizing the procedure for determining the trace hydrocarbon content of marine tissue.

As previously reported, studies are underway to determine if the Katalla River sediment would be suitable as a petroleum-in-sediment intercalibration material. Frozen samples of this sediment have been sent to J.A. Calder, Florida State University, and J.S. Warner, Battelle Columbus Laboratories, for trace hydrocarbon analysis by their respective analytical methodologies. In addition, we retained and analyzed four bottles of the sediment by headspace sampling and GC/GC-MS. The contents of a fifth bottle were Soxhlet extracted and cleaned up by LC to give the water content of the sediment and a total extractable hydrocarbon value. A complete discussion of results is found in the summary of fourth quarter activities.

VIII. CONCLUSIONS

The water and sediment data determined for the spring 1975 collection is consistent with prior water and sediment data. The results of our first limited sediment sample split are encouraging. The results of the analysis of the water samples collected jointly with Dr. D. Shaw indicated no difference (within experimental error) between the two water sampling devices used. Differences in the results, based on analytical methodology, cannot be assessed until we receive Dr. Shaw's results.

IX. NEEDS FOR FURTHER STUDY

Since the sea ice-water interface project was severely cut back this year, next year's efforts will have to be enlarged. Funding was not sufficient for us to collect samples this year and although the University of Alaska had agreed to collect samples for us, they have not as yet supplied us with samples.

We expect the quality assurance program to grow in the next year. During this period we should complete a sediment and tissue round robin. We expect all NOAA contractors involved in trace organic analysis to participate in this study. Of relevance to the quality assurance program are the recommendations of the NBS/EPA Workshop on SRM's for Offshore Drilling of Petroleum. A summary of this Workshop is appended to this annual report.

X SUMMARY OF FOURTH QUARTER ACTIVITIES

A. Sediment Intercalibration Study

As stated above, a small sediment intercalibration study was initiated. To date we have received data and results from Dr. John Calder of Florida State University. His results and ours are summarized in Table 1. Dr. Calder's analytical procedure involved multiple ultrasonic bath extractions of the sediment with methanol and methylene chloride followed by saponification of the lipids. The extracted non-saponifiables were subsequently chromatographed on alumina:silica gel, reduced to a small volume for GC analysis and then taken to dryness for weighing. A single sediment sample was analyzed at NBS by Soxhlet extraction (48 hours with ethyl ether). The ether extract was passed through anhydrous Na_2SO_4 and reduced to 2 ml; the hydrocarbons were isolated by liquid chromatography on a μBondapak NH_2 column, reduced to a small volume for GC analysis and then taken to dryness for weighing. We have shown μBondapak NH_2 columns to be efficient in the removal of organic compounds of biological origin from sediment extracts. These columns also yield more efficient class separations of the various compounds of interest (aliphatics, aromatics, thiophenes) than do the alumina:silica gel columns commonly used.

Although the results obtained from this intercalibration experiment are quite limited, they show that a more extensive intercalibration exercise using the Katalla River sediment would be valuable.

Homogeneity studies of the sediment from four different sample bottles (analyzed using headspace sampling-GC) gave values listed in Table 2. Statistical analysis indicates that, at a 99% confidence level the results from the 1Q series do not belong to the same population as the results of the other series. A possible explanation for this may be the following. Examination of the GC data of the 1Q series shows a much larger recovery of the first two internal standard compounds than normal for headspace sampled sediment. Inasmuch as the bulk of the hydrocarbons elute in the GC region of the first two internal standards, the high recovery of these standards causes the calculated analytical results to be low.

The data from the sediment in the three sample bottles, 9P, 10P, and 3N, indicate that with a sample size of ∿40 g the relative bottle-to-bottle precision is of the same order of magnitude (∿10% relative standard deviation of the mean) as that obtained for three replicate analyses from the same bottle (∿6% average relative standard deviation of the mean). A more extensive intercalibration exercise will be preceded by more efficient homogenization of the bulk sediment; thus the bottle-to-bottle precision should improve.

In comparing the gas chromatographic results of both laboratories several comments may be made. The overall agreement between the results (.97 μg/kg vs 3.5 μg/kg) is quite good considering the present state-of-the-art of hydrocarbon analyses in sediment samples. It is evident from the list of four most abundant compounds that the extraction methods appear to emphasize the recovery of the aliphatic hydrocarbons at the expense of the substituted two-condensed ring aromatic hydrocarbons. The substituted naphthalenes, of interest due to their high toxicity to marine life, elute chromatographically in the $\underline{n}$-C_{11} - $\underline{n}$-C_{13} range. An examination of Calder's and the NBS Soxhlet extraction GC data and the quantitative amounts of the various $\underline{n}$-alkanes indicates some losses of compounds (presumably during the evaporation-concentration step) up to $\sim\underline{n}$-C_{15}. The four largest peaks from Calder's aromatic fraction are listed in Table 1. These peaks, while unidentified, do elute in the range of the substituted naphthalenes ($\underline{n}$-C_{11} - $\underline{n}$-C_{13}) and would be subject to losses during the evaporation-concentration step.

The difference in GC elution profiles from solvent extracted and headspace sampled sediment samples is made further evident by comparing histograms of concentration vs time corresponding to the respective gas chromatograms (Fig. 1). While the $\underline{n}$-aliphatics are more prominent in the extracted sediment (Fig. 1A), the substituted naphthalenes are more prominent in the headspace sampled sediment. The GC-MS total ion chromatogram and m/e 43 and m/e 142, 156 and 170 single ion records (Fig. 2) confirm the latter. It appears, then, that while both the solvent extraction and headspace sampling methods yield essentially the same value for low level hydrocarbon contamination in a sediment sample, they emphasize different aspects of that contamination. Solvent extraction methods primarily provide information about the aliphatic hydrocarbons, in the $\underline{n}$-C_{12} - $\underline{n}$-C_{30} molecular weight range, in contrast to the headspace sampling method which additionally provides information about the toxic substituted naphthalenes. The latter technique can be complemented by the NBS extraction-LC-fluorescence detection method which provides information about the PAH concentration of the sample.

In the near future an NBS sampling party will collect ∿100 kg each of two Alaska intertidal sediments (Katalla River and a control site) for a more extensive intercalibration exercise. These sediments will be homogenized, have their homogeneity evaluated and be sent to the laboratories participating in the exercise.

B. Hydrocarbon Analysis in a Tissue Bound Matrix

Work is continuing on the development of an analytical method for the determination of petroleum hydrocarbons in various marine tissue samples. Initial efforts have been previously reported; in short, they involve dynamic headspace sampling of the tissue homogenate followed by liquid chromatographic removal of the biogenic polar components extracted. High resolution gas chromatography is then used for quantitation of the petroleum hydrocarbons present in the headspace extract. Two main areas of concern are currently being pursued. (1) Since most of the organic compounds being removed from the tissue homogenate are of biological origin, a substantial effort is being concentrated on the liquid chromatographic cleanup and removal of these biogenic compounds from the total extract. Effective cleanup should permit a reduction of the biogenic background in the gas chromatogram used for quantitation, and allow greater sensitivity (sub-microgram per kilogram) than now possible for individual components. (2) The determination of the relative recoveries of the petroleum hydrocarbons incorporated in the tissue sample is also of great concern. It is necessary to establish the level of recovery of the various classes of petroleum hydrocarbons from tissue so that appropriate sample sizes can be used for desired sensitivity levels. It is also imperative to know whether the internal standard compounds added to the tissue for quantitation purposes are recovered to the same extent as these components would be if incorporated in the tissue matrix.

As previously reported (July 15, 1975 Quarterly Report), a number of liquid chromatographic packing materials have been investigated for their ability to separate the petroleum hydrocarbons of interest from the biogenic compounds simultaneously headspace extracted from mussel tissue homogenate.

μBondapak NH_2 is an LC packing material currently being investigated for its ability to separate hydrocarbons from common biogenic compounds as a clean up step prior to GC analysis. When using a nonpolar mobile phase such as pentane, the μBondapak NH_2 column provides a class separation similar to that obtained using a silica column, i.e., saturated hydrocarbons elute before unsaturated hydrocarbons and aromatics, and the elution volume for the aromatics increases with the number of condensed rings. Retention volume data for some hydrocarbons and some alcohols (Table 3) indicate that alcohols are strongly retained on the μBondapak NH_2 column when a nonpolar mobile phase is used. The alcohols (possible biogenic compounds) can be eluted from the column by increasing the polarity of the mobile phase. Using the μBondapak NH_2 column to achieve a class separation eliminates the major difficulty encountered when using silica columns: loss of resolution due to deactivation caused by the presence of traces of water in the sample.

In a previous report (July 1975) a partial LC cleanup of the biogenic background headspace-sampled from mussels was reported using a copolymer (styrene/divinylbenzene/methacrylic acid) packing material. Figure 3 compares the hydrocarbon separations achieved using this acid column (A) and the μBondapak NH_2 column (B). Clearly, the μBondapak NH_2 provides a more efficient separation of the test mixtures. In addition the copolymer packing material was available only in a limited quantity. Further investigations using this material were abandoned to pursue the more promising μBondapak NH_2 column. Figure 4 compares the gas chromatogram obtained from a headspace-sampled mussel TENAX GC column (A) and the gas chromatogram of the 3-13 ml fraction (evaporated to ca. 200 μl) collected from a μBondapak NH_2 column (B).

The very efficient class separation and biogenic cleanup provided by the μBondapak NH_2 column will allow the collection and subsequent GC analysis of narrow fractions according to hydrocarbon class, such as aliphatics, unsaturated hydrocarbons, benzenes, naphthalenes, 3-ring aromatics, and higher PAH's (i.e., those having 4,5, and 6 rings). The possibility exists for using the μBondapak NH_2 column to achieve the class separation and then using a μBondapak C_{18} column to separate the various collected fractions according to solubility. Investigations of the μBondapak NH_2 column for cleanup and class separation of the headspace sampled mussels are continuing.

In the LC cleanup procedure the LC TENAX column (3 cm in length as compared to 6.5 cm for the GC TENAX column) which contains the extract from the headspace-sampled mussel, is stripped with pentane onto the μBondapak NH_2 column and a 10 ml fraction of the eluent is collected. The fraction is evaporated to ca. 200 μl and subsequently tramsferred to a GC TENAX column for high resolution GC analysis. Pentane is vented from the TENAX column by allowing the carrier gas to flow through it for about 5 minutes prior to connection to the capillary GC column.

Various experiments were performed in order to determine the extent of hydrocarbon losses which occur in the various steps of this LC cleanup procedure. Losses of the internal standard hydrocarbons due to the venting of excess pentane from the GC TENAX prior to GC analysis were found to be minimal (<10%). In the evaporation of the 10 ml pentane fraction to 200 μl and subsequent GC, some losses of lower molecular weight hydrocarbons were observed (∿75% for Me_5C_7, ∿25% for MeC_{14} and ∿10% for MeC_{16}). These losses are assumed to have occurred during the evaporation-concentration step.

In order to determine the overall recovery of hydrocarbons using the headspace sampling-LC cleanup procedure, a water blank containing known amounts of various hydrocarbons was analyzed. The overall hydrocarbon recoveries observed were 69% for MeC_{14}, 84% for MeC_{16}, 20% for phenanthrene and 93% for MeC_{18}. The low recovery of phenanthrene is consistent with previous headspace sampling results from water, indicating minimal losses during the LC cleanup procedure. Recoveries of the aliphatic hydrocarbons are quite comparable to those obtained above from the evaporation-concentration process. In summary, the losses of hydrocarbons during the LC cleanup procedure are quite acceptable ($\sim$25% for MeC_{14} and less for higher molecular weight compounds), and it will be utilized further in our experimentation with tissue.

We had previously determined that aromatic hydrocarbons utilized as internal standards in headspace analysis of *Mytilus* tissue homogenate can be recovered to the following extent (no LC cleanup): naphthalene 61 ± 20%, trimethylnaphthalene 31 ± 22% and phenanthrene, 16 ± 14% (NBS Technical Note 889). Experiments conducted with *Mytilus* exposed to ^{14}C-naphthalene showed a recovery of 78 ± 12% by the same headspace analysis technique. This indicated that, at least in the case of naphthalene, the aromatic internal standard added to the mussel tissue homogenate could be recovered to the same extent as that aromatic hydrocarbon incorporated into the live mussel.

Subsequent experimentation confirmed the previously determined recoveries of the aromatic hydrocarbons (18 ± 16% recovery for trimethylbenzene, 76 ± 31% for naphthalene, 47 ± 19% for trimethylnaphthalene and 12 ± 7% for phenanthrene) but indicated that aliphatic hydrocarbons added as internal standards show much lower recoveries from tissue homogenate (12 ± 6% for methyl-C_{11}, 11 ± 4% for methyl-C_{14}, 4 ± 0.5% for methyl-C_{16} and 2 ± 0.8% for methyl-C_{18}). It was assumed that the aliphatic hydrocarbons were being retained in the lipid fraction in the tissue homogenate and the partition coefficient for these hydrocarbons between the headspace sampling gas

(He or N_2) and the organophilic lipid fraction was quite unfavorable. A series of experiments were conducted using KOH, KCl, KOH+KCl, squalane and caffeine, as additives to the tissue homogenate, to determine whether the presence of these additives would cause the recoveries of the aliphatic compounds to increase.

Results of these preliminary experiments show some improvement in the recoveries of the aliphatic hydrocarbons when the homogenate was made 0.1F in KOH and 1F in KCl (9% for methyl-C_{11}, 19% for methyl-C_{14}, 17% for methyl-C_{16} and 13% for methyl-C_{18}). Some marginal improvement was noted with the use of squalane (∿20 mg in 30 g of tissue) and no improvement for the other additives tried. At the same time 0.1F KOH appeared to increase the recovery of the aromatic hydrocarbons added to the tissue (especially for trimethylnaphthalene and phenanthrene) while caffeine and 1F KCl appeared to reduce these recoveries. The combination of KCl and KOH appeared to have minimal effect on the aromatic hydrocarbon recoveries. Work is continuing on the problem of hydrocarbon recovery from tissue with the use of longer headspace sampling times (at 70 °C) being investigated alone and in conjunction with the KCl+KOH additives.

C. Liquid Chromatography of PAH's

The coupled column liquid chromatographic technique developed in this laboratory (see attached Tech Note #889) has been shown to be an effective means of preconcentrating and separating polynuclear aromatic hydrocarbons (PAH's). The extraction efficiency of the pre-column, and the elution order from the chromatographic system appear to be inversely related to the solubilities of these compounds in water (see Table 4). However, actual recoveries of PAH's from water samples are maximum for compounds with molar solubilities on the order of 1×10^{-7}. More soluble compounds such as benzene and naphthalene are not efficiently extracted by the pre-column. Recoveries of compounds with smaller molar solubilities in water suffer from adsorption losses on glass surfaces and transport tubing.

The effects of a 0.1% solution of caffeine on the solubility of various PAH's has been determined. It has been postulated that caffeine forms water soluble complexes with PAH's. (See Eisenbrand, J., and Bawmann, K., Z. Lebensm-Unters. Forsch. 1970, 144(5), 312-317). Our experimental results indicate that this complex is broken on the pre-column with the PAH being trapped and the bulk of the water soluble caffeine passing through unretained. Glucose and barbital have also been investigated as adsorption suppressants. It is evident from Table 5 that substantial losses of PAH's occur in untreated aqueous systems even after relatively short time periods (0-4 hours). The relative effectiveness of caffeine as a complexing agent in keeping the PAH's in solution is also quite evident. While some losses do occur, the test solutions appeared to be stable and suffer no further losses of PAH's after 16-20 hours. Neither glucose nor barbital approached the effectiveness of caffeine in these studies. Work to determine the minimum amount of caffeine needed to achieve this enhancement in recovery is underway.

During the past year we have investigated the use of fluorescence as a tool for obtaining added sensitivity and selectivity, and also as a tool to aid in the identification of PAH fractions as they elute from the chromatographic system. All photoelectric instruments for measuring fluorescence are termed fluorometers. Every fluorometer or fluorescence spectrometer, no matter how simple or complicated contains three basic items: 1) a source of radiant energy to irradiate the sample; 2) a sample cell; and 3) a detector to measure the fluorescence. They are designated filter fluorometers or fluorescence spectrometers (spectrofluorometers), according to the method of selecting the exciting and fluorescence wavelengths. The filter fluorometer uses optical filters for selection of the optimum spectral ranges for maximum emission intensity for a given class of compounds. The spectrofluorometer employs two monchromators for this purpose. With dual monochromators the wavelength of excitation and fluorescence may be determined and utilized selectively. These monochromators which provide a narrow spectral bandpass to increase selectivity, cause a loss in sensitivity. Thus, although filter fluorometers provide more sensitivity, spectrofluorometers allow us to obtain both excitation and emission spectra permitting compound identification.

We have briefly evaluated the fluorescence detectors of three commercial manufacturers and compared their performance to that of the Model 44D UV detector manufactured by Waters Associates. The data obtained during this limited study appear in Table 6 where the detection limits reported refer to the amounts of material represented by a given peak and not the amount of material actually in the detector flow cell at any given time. The most sensitive filter photometer evaluated offers only one order of magnitude increase in sensitivity over the UV photometer. The detection limits reported for the UV photometer and the spectrofluorometer are comparable. However, the spectrofluorometer may be used as a selective detector for a given PAH family (utilizing specific excitation and fluorescence wavelengths) or to obtain spectra on the various fractions as they elute from the chromatograph.

In order for the Jasco FP-4 spectrofluorometer to function both qualitatively and quantitatively as we desired several modifications were made to the instrument by Mr. Richard Christensen of NBS.

1) Modifications to Cell and Holder

It was noted that the holder for the 6 μl-flow cylindrical cell was constructed in such a way as to reduce the aperture of both the excitation and emission beams (Figure 5). The original holder was modified to admit the whole beam to the cell and another cylindrical cell of slightly larger dimensions was tried (Figure 5B). These modifications provided some performance advantages, but the sensitivity seemed to be limited by the small volume of the cell. In addition, considerable scattering from the excitation beam arose from the tubular geometry of the cell. Therefore it was decided to adopt a 36-μl cell of square cross-section. This cell and its holder are shown in Figure 5C; it has proven to be quite satisfactory except for some difficulties in clearing bubbles from some solvent systems.

2) Modifications to the Monochromator

In order to gain sensitivity, the manufacturer had fitted the monochromators with slits which gave a 10 nm spectral bandpass. It was therefore very difficult to obtain spectra from which identifications could be made (Figure 6A). Since the emission monochromator is readily accessible in the instrument, it was decided to sacrifice some sensitivity and fit it with smaller slits. The 1.0 mm slits were replaced with 0.5 mm slits, resulting in the improved spectrum shown in Figure 6b.

3) Modifications to the Flow System

In order to obtain spectra of peaks of interest, it was necessary to trap a part of that peak in the cell. (Total peak widths range from 0.5-2.00 cc depending upon the conditions under which the run is made.) This may be done in either of two ways:

a) stop flow; or

b) use a valve to shunt the flow from the chromatograph around the cell after the peak of interest has been trapped.

The latter method was selected since it does not cause any disruption in the chromatographic run. With the use of a three-way valve a spectrum may be taken every 1.5 minutes. Under normal run conditions, (flow rate 2 cc/min) peaks must be separated by 3 cc. However, the flow rate may be slowed to the point that each peak need only be resolved by 2 cc . Figure 7 shows the LC fluorescence analysis of the ether extract of a sediment sample collected in the Bahamas. A library of reference spectra is being compiled and several other sediment samples are being analyzed by this LC-fluorescence procedure. The results of these analyses plus analyses of water samples by coupled column and an extraction LC-fluorescence technique will be given in a future quarterly report.

Table 1. **Results** of an interlaboratory study of a Katalla River sediment.

Laboratory	Total Hydrocarbons (µg/g dry weight basis) Gravimetry	GC	Pristane/Phytane Ratio	Sample Size (dry weight)	Percent water	Four most abundant compounds/amounts (µg/kg)
J.A. Calder	33.0	3.5 (C_{12}-C_{25} range)	3.37 ± 0.44* (n=2)	207 g	20	pristane/270, n-C_{19}/178; n-C_{20}/178; n-C_{21}/170 **four largest peaks from aromatic fraction (retention time/amount) 3.09 min/100; 2.61 min/82; 3.92 min/74; 3.33 min/59
NBS-Headspace sampling GC/GC-MS	----	0.97 ± 0.07* (n=8) (C_{11}-C_{22} range)	2.34 ± 0.08* (n=5)	25-35 g		CH_3-naphthalene/40; $(CH_3)_2$-naphthalene/28; $(CH_3)_2$ naphthalene/27; $(CH_3)_2$-naphthalene/26
NBS-Soxhlet extraction	85.5	3.5 (C_{11}-C_{22} range)	1.56 (n=1)	190 g	24	n-C_{14}+$(CH_3)_2$-naphthalene/247; n-C_{13}/105; n-C_{17}/77; n-C_{15}/68.

* Standard deviation of replicate values from the mean of n replicate values.

** Identity of peaks not provided with data; see text for further discussion.

Table 2. Homogeneity studies on Katalla River sediment.

Analysis #	Number of Replicates	Concentration (μg/g dry weight)
10P	3	1.04 ± 0.03*
9P	3	0.77 ± 0.03
1Q	3	0.27 ± 0.02
3N	2	1.18 ± 0.25

*Standard deviation of replicate values from the mean of n replicate values.

Table 3. Chromatographic Retention Volumes (in milliliters) for a number of hydrocarbons and alcohols on three liquid chromatographic packing materials.

Compound	μBondapak NH_2			μBondapak CN	μBondapak C_{18}
	Cyclohexane	2% CH_2Cl_2 Cyclohexane	10% CH_2Cl_2 Cyclohexane	Cyclohexane	60% CH_3CN 40% H_2O
Benzene	4.4	4.2	4.1	3.3	6.9
m-xylene	4.4	4.2	4.0	3.3	11.5
mesitylene	4.4	4.2	3.9	3.3	15.2
naphthalene	6.0	5.3	4.4	3.6	10.9
2-methyl naphthalene	6.0	5.3	4.4	---	14.4
2,3-dimethyl naphthalene	6.0	5.3	4.4	3.6	18.3
anthracene	8.7	7.3	5.2	3.9	19.1
2-methyl anthracene	8.7	7.3	5.1	---	26.6
phenanthrene	---	7.4	5.3	4.0	18.2
p-terphenyl	10.1	7.4	---	---	----
1,3,5-triphenyl benzene	12.6	8.5	5.3	4.0	----
pyrene	12.2	8.9	5.8	4.1	24.7
fluoranthene	14.2	9.6	6.1	4.2	29.1
1,2-benzanthracene	19.0	11.8	6.6	4.5	35.0
chrysene	19.8	12.4	6.8	4.5	33.0
20-methyl cholanthene	22.0	13.2	6.9	4.6	----
benz(a)pyrene	----	16.3	8.9	4.8	50.0
3,4-benzopyrene	26.6	15.9	8.9	4.8	----
perylene	----	----	8.8	5.0	----
indeno[1,2,3-cd] pyrene	----	22.5	9.5	5.4	----
benzo[GHI]perylene	----	----	10.1	5.3	----
dibenzo(DEF,P) chrysene	----	32.4	11.9	---	----
ruberene	----	----	16.6	6.2	----
n-pentanol	>175				
n-undecanol	>175				
n-hexadecanol	>175				
p-cresol	>175				

Table 4. Retention of polynuclear aromatic hydrocarbons on µBondapak C18

	Elution* Volume (ml)	Coupled Column LC Recovery From H_2O	Solubility (mol/l)	
Benzene	6.9	<5	2.3×10^{-2}	a
Naphthalene	10.9	19 ± 2	8×10^{-4}	b
Phenanthrene	18.2	92 ± 12	9×10^{-6}	c
Pyrene	24.7	78 ± 17	9×10^{-7}	c
Fluoranthrene	29.1		1.2×10^{-6}	d
Chrysene	33.0		7×10^{-9}	c
1,2 Benzanthracene	35.0	58 ± 12	5×10^{-8}	c
3,4 Benzpyrene	50.0		1.6×10^{-9}	b
1,2,5,6 Dibenzanthracene	66.0	14 ± 8	2.0×10^{-9}	c

* Chromatographic Conditions

column - µBondapak C18
mobile phase: 60% CH_3CN, 40% H_2O
temp - ambient

a) McAuliffe, C., J. Phy. Chem. 70, 1267 (1966).

b) Eisenbrand, J., Deut. Lebensm. Rundsch. 67, 435 (1971).

c) Davis, W.W., Krahl, M.E. and Clowes, G.H.A., J. Am. Chem. Soc. 64, 108 (1942).

d) Eisenbrand, J.Z. Lebensm. Untersuch. Forsch. 144, 312 (1970); Chem. Abstracts, 74, 46153h.

Table 5. Recoveries of various PAH's during coupled column LC analysis of aqueous solutions containing complexing agents.

Experiment	Complexing Agent	Experimental Conditions	Percent Recovery**			
			Pyrene	Chrysene	Benz(a)pyrene	Dibenzanthracene
1	0.1% caffeine	Stir ~4 hr, then analyze	90	90	90	56
	None	"	71	39	32	22
2	0.1% caffeine	Stir 16-20 hr, then analyze	75	71	68	39
	None	"	26	28	14	15
3	0.1% caffeine	Stir, 40 hr and analyze	88	78	75	39
	None	"	4	7	4	3
4	0.1% glucose	Stir 40 hr, then analyze	3	20	5	20
5	0.1% barbital	Stir 40 hr, then analyze	29	28	6	28

* 0.5 μg of each PAH present in 500 ml of distilled water.

** % recovery compared to an on-column spike of the PAH's onto a C_{18}-μBondapak reverse phase LC column.

Table 6. Detection limits** (in ng) of PAH's on various commercial LC detectors

	Waters[1]	Jasco[2] FP-4 (as received)	Aminco[3]	Schoffel[4]
Naphthalene	4	13	X	X
Phenanthrene	0.04	1.5	X	X
Pyrene	0.09	0.19	X	X
Chrysene	0.10	0.14	X	X
3,4 Benzpyrene	0.06	0.05 0.02*	0.02	0.007
1,2,5,6 Dibenzanthracene	0.51	0.20	1.55	No measurement made

1 Waters 440 UV photometer - absorbance at 254 nm monitored.

2 Jasco FP-4 Spectrofluorometer - excitation and emission λ's optimized for each compound.

3 Aminco-Bowman Fluoro-monitor - primary filter: Corning #7-51, Secondary filter: Wratten #8.

4 Schoffel Model 970 Fluorescence monitor - excitation - 254 nm; emission: filter, max transmission at 418 nm

X Spectral region for detection of these compounds excluded by secondary filter employed. By selecting other filters, these compounds could be detected.

* Detection limit for 3,4 benzpyrene after flow cell and optical modifications.

** Detection limit defined as that amount of material that must be injected onto column to give a detector response twice that of noise.

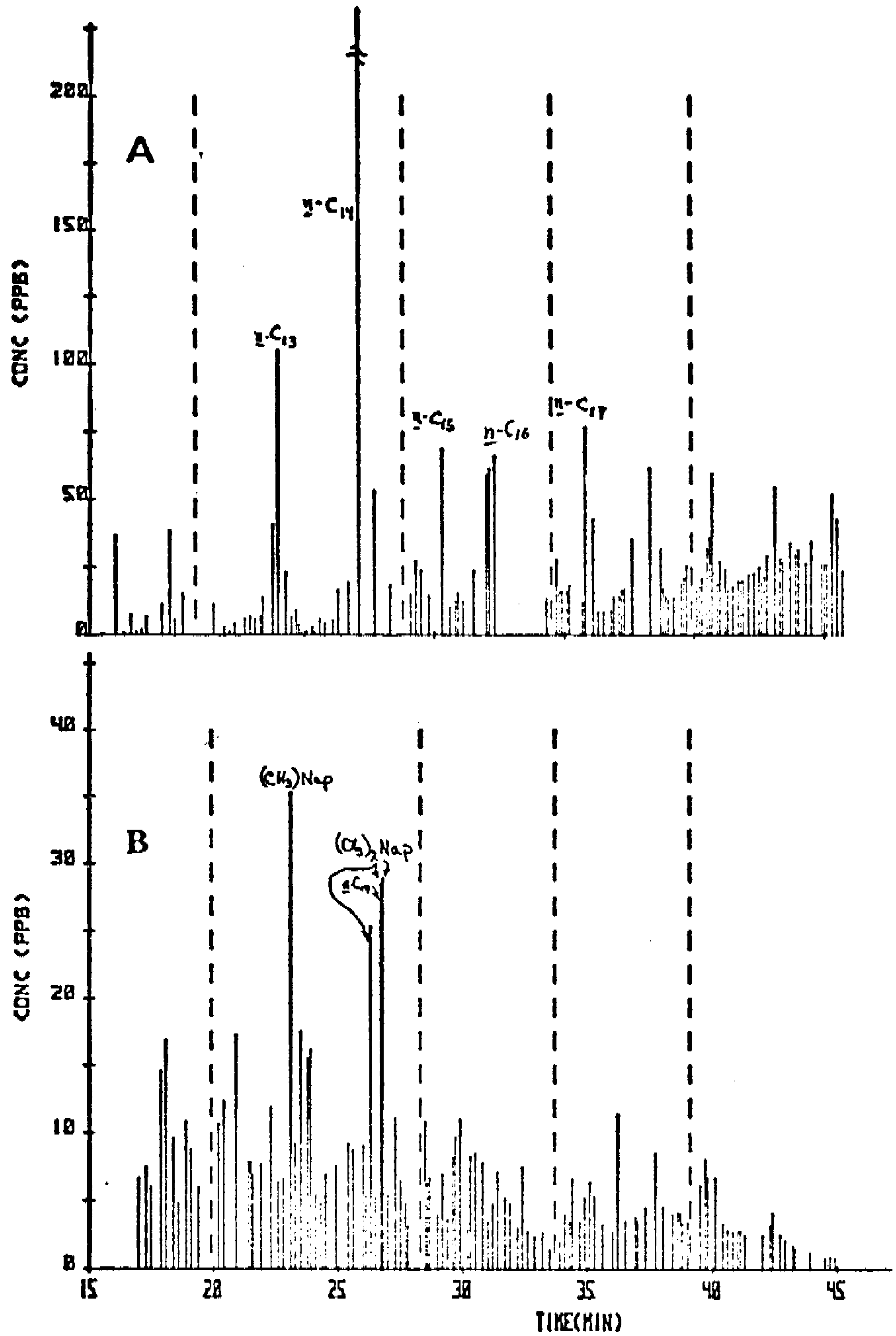

Figure 1. Concentration vs time histograms of (A) Soxhlet extracted and (B) headspace sampled Katalla River sediment. Peak heights from the respective gas chromatograms have been plotted as single species concentrations (reduced relative to the internal standards). The retention times of the internal standards are denoted by dashed lines.

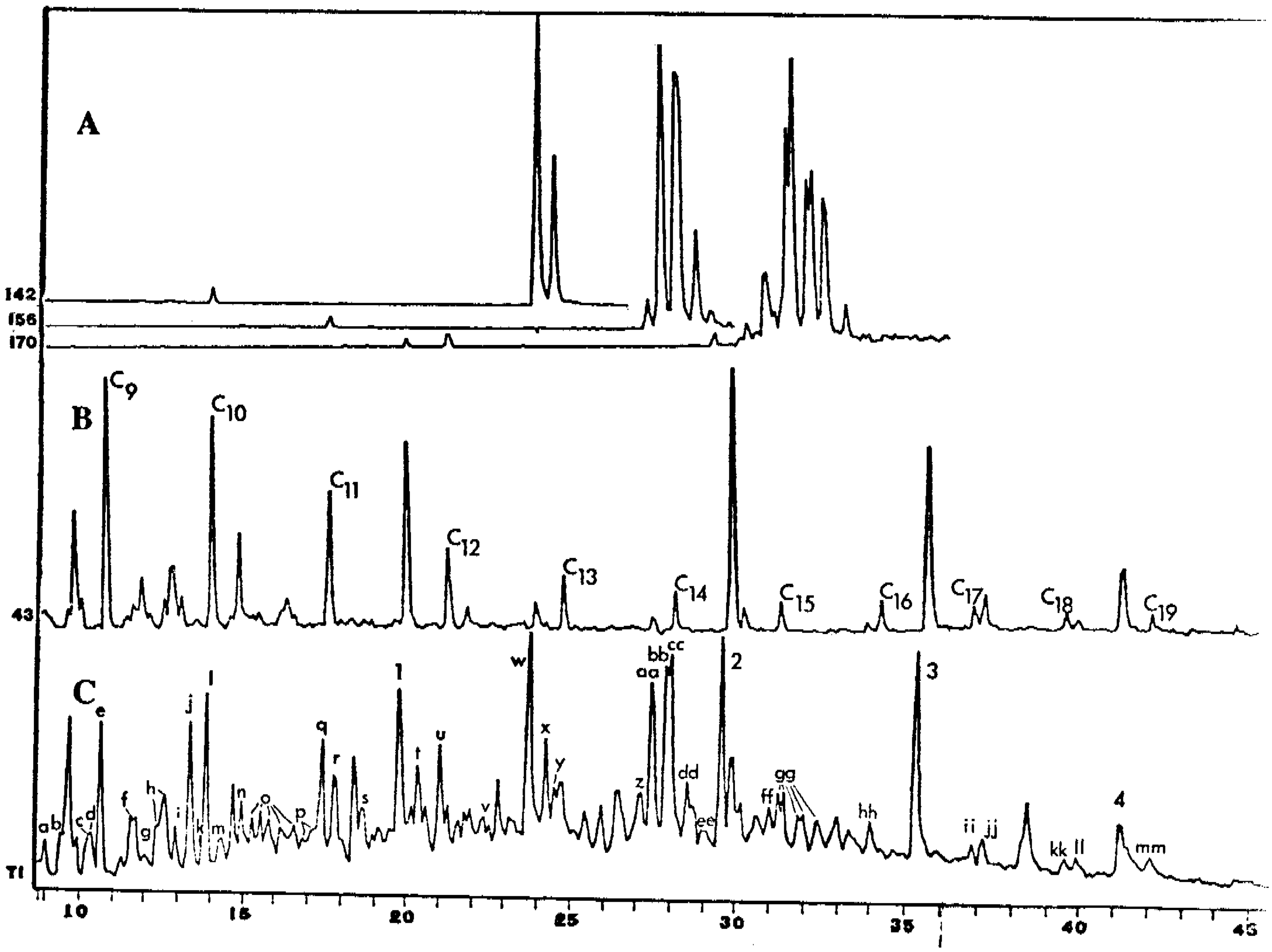

Figure 2. GC-MS analysis of Katalla River sediment: (A) composite m/e 142, 156 and 170 single ion records indicating presence of C_1, C_2, and C_3-naphthalenes, respectively, (B) m/e 43 single ion record, (C) total ion chromatogram. C_x=alkane containing x carbon atoms. C_x-Ø=benzene substituted with x carbon atoms (e.g. C_3-Ø could be trimethyl-, propyl-, isopropylbenzene, etc.) Peaks labeled 1,2,3,4 are the internal standards methyl-C_{11}, methyl-C_{14}, methyl-C_{16}, and methyl-C_{18}, respectively. Identifications followed by "?" are not definite due to incompletely resolved spectra.

- a C_2-cyclohexane
- b C_2-Ø
- c C_2-Ø
- d C_3-thiophene
- e n-C_9
- f $\overline{C}_3$-cyclohexane
- g propyl-Ø
- h C_3-Ø
- i C_3-Ø
- j C_3-Ø & C_4-thiophene
- k C_4-thiophene
- l n-C_{10}
- m $\overline{C}_3$-Ø
- n C_4-cyclohexane
- o C_4-Ø
- p C_5-thiophene ?
- q n-C_{11}
- r $\overline{C}_4$-Ø
- s C_5-cyclohexane
- t C_2-decalin
- u n-C_{12}
- v $\overline{C}_6$-cyclohexane
- w C_1-naphthalene
- x C_1-naphthalene
- y n-C_{13}
- z ethyl-naphthalene
- aa C_2-naphthalene
- bb n-C_{14} & C_2-naphthalene
- cc $\overline{C}_2$-naphthalene
- dd C_2-naphthalene
- ee ethyl-naphthalene
- ff n-C_{15}
- gg $\overline{C}_3$-naphthalene
- hh n-C_{16}
- ii n-C_{17}
- jj pristane
- kk n-C_{18}
- ll phytane
- mm n-C_{19}

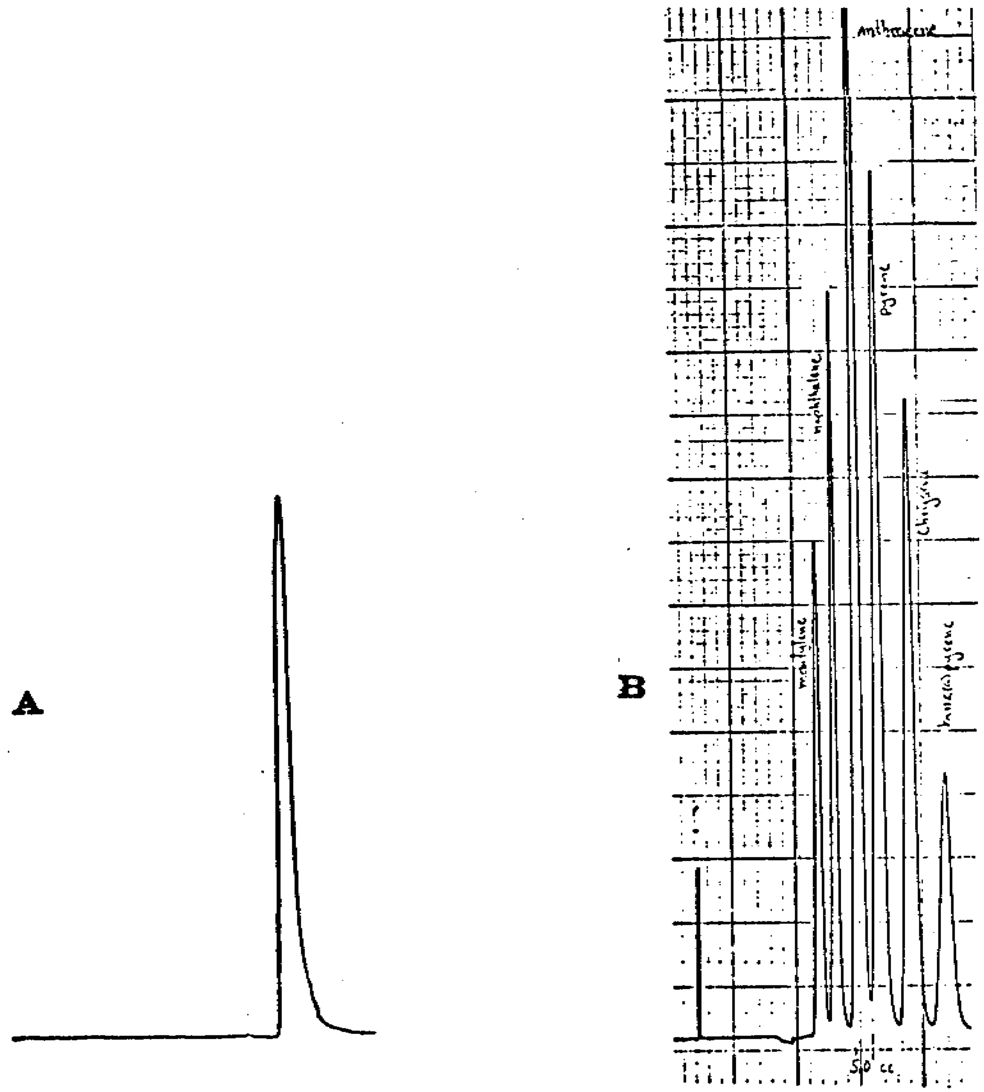

Figure 3 . (A) Liquid chromatogram on copoly(styrene/divinylbenzene/ methacrylic acid) packing material; hydrocarbon test mixture: mesitylene, naphthalene, trimethylnaphthalene, phenanthrene and 9-methylnonadecane; (B) chromatogram on μBondapak NH_2, test mixture: mesitylene, naphthalene, anthracene, pyrene, chrysene, benz(a)pyrene

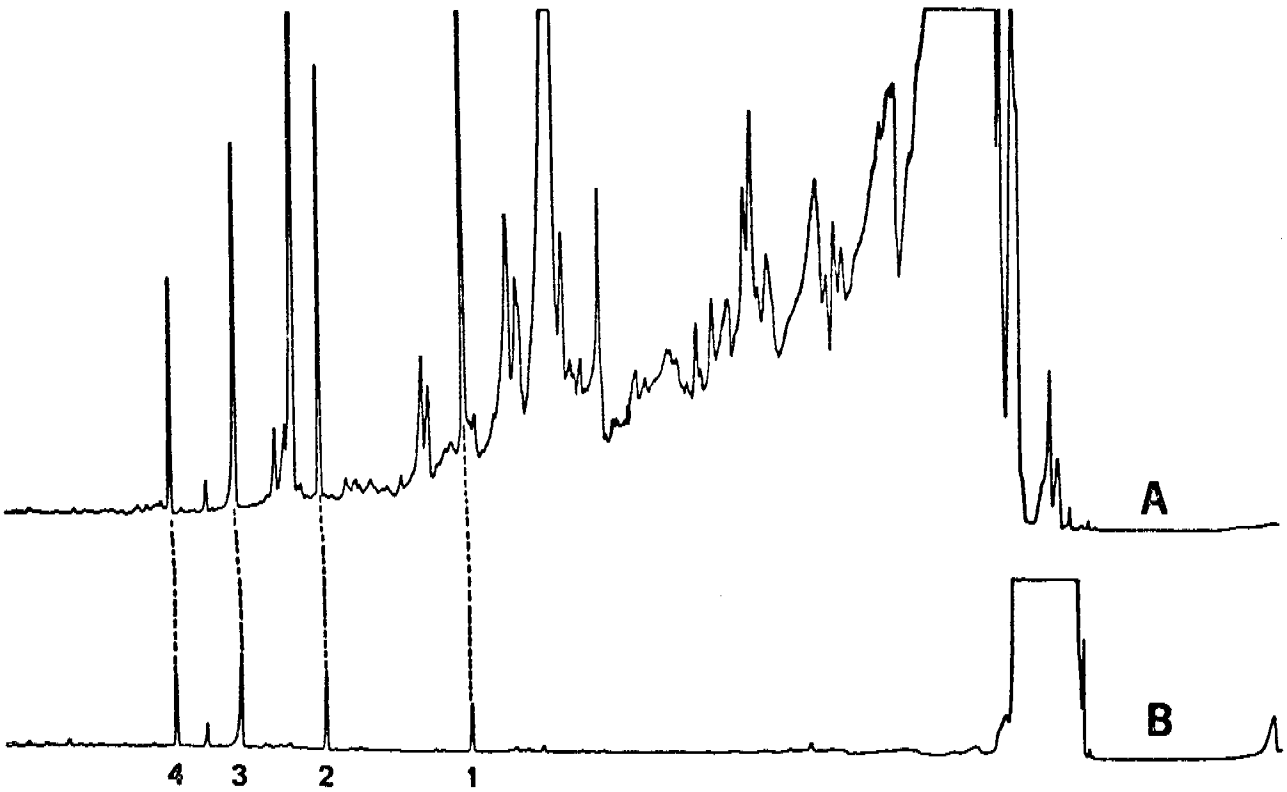

Figure 4. Gas chromatograms of headspace sampled whole mussels (A) with no LC cleanup of sample and (B) with LC cleanup using μBondapak NH_2 column. Both samples were spiked with (1) 5-methyl-tetradecane, (2) 7-methyl hexadecane, (3) phenanthrene, and (4) 2-methyl-octadecane.

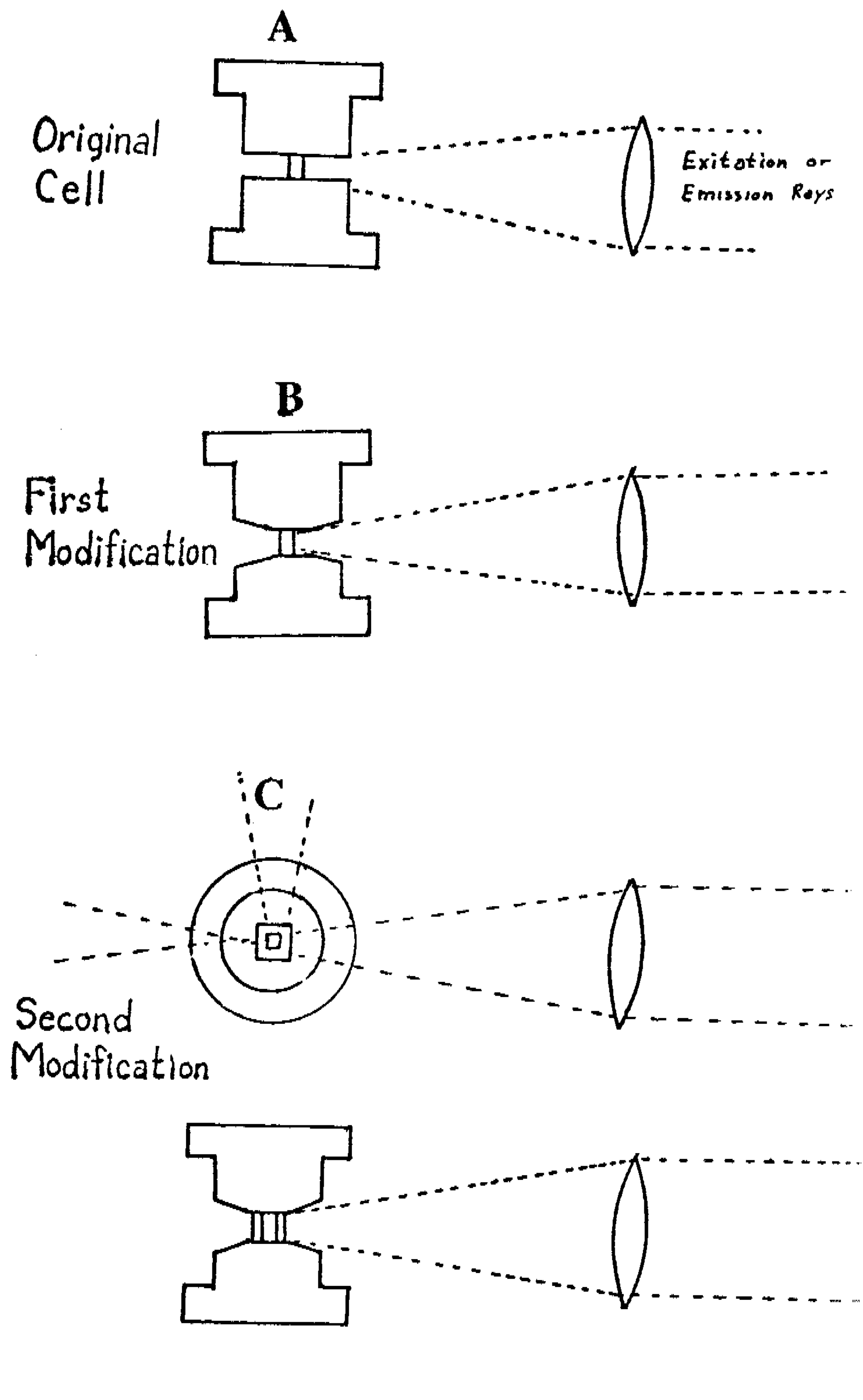

Figure 5. Modifications on Jasco FP-4 flow cell.

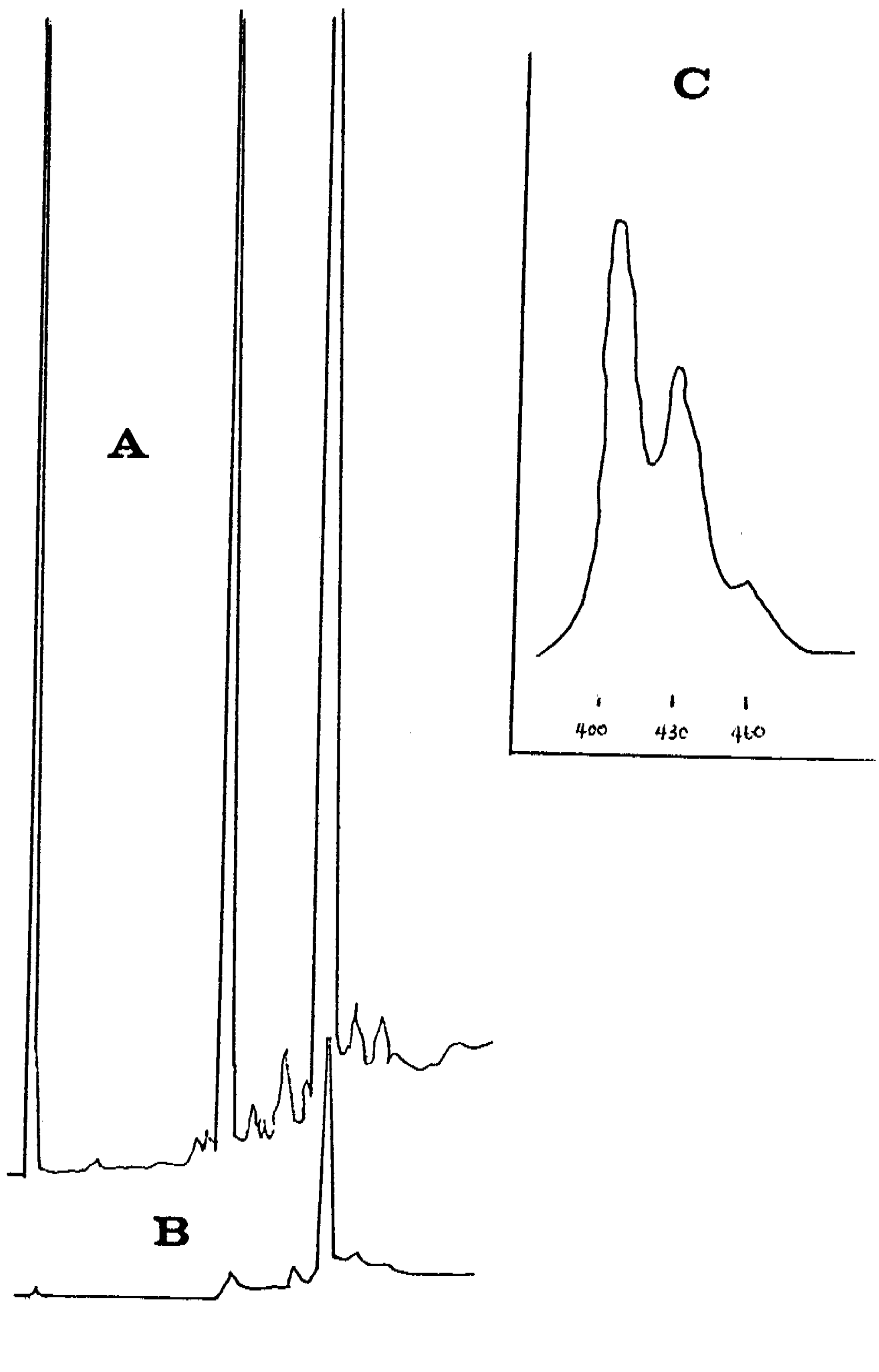

Figure 7. A. UV (254 nm) monitored chromatogram of an ether extract of a sediment sample collected in the Bahamas; B. Fluorescence monitored (ex 290 nm; em 405 nm) chromatogram of the same extract; C. Fluorescence emission spectrum of the major component in both chromatograms.

Workshop on SRM's for Offshore Drilling - Petroleum
Santa Barbara, California, October 6-7, 1975

Summary

There are currently nine offshore platforms along the coast of Santa Barbara, California. These platforms contain as many as 70 wells each. In the near future the number of offshore drilling rigs will probably drastically increase. This increase is being preceded by a large number of environmental baseline studies and will require significant efforts in environmental monitoring once offshore drilling begins. In 1973 the Bureau of Land Management contracted $400,000 for the purpose of offshore baseline studies; in 1975 baseline studies were funded at the level of $50,000,000. These baseline studies require many measurements and yield large volumes of data. For all these data to be meaningful they must be made comparable to data obtained by other researchers, at other times and in other geographic locations. One means of providing comparability is through intercalibration efforts between laboratories. NBS Standard reference Materials (SRM's) are designed to be tools for insuring meaningful measurement and hence, comparability of results. SRM's are defined as well-characterized materials, produced in quantity and certified by NBS to help: calibrate instruments, develop reference methods of measurements, and provide long-term quality control in measurement systems. It was the aim of this workshop to determine what SRM's are desired for analyses related to offshore oil drilling, what problems must be solved before these SRM's can be made available, and what interim calibration materials are desired to serve the time period until SRM's are released.

I. Summary of Suggestions and Viewpoints Expressed at the Workshop

A. General Comments

Several people presented background material on prior intercalibration studies. The ASTM has run round robin experiments on its oil and grease method. This technique is sensitive to high levels of hydrocarbons (mg/1) and is based on the 2930 cm^{-1} infrared adsorption band of freon extractable hydrocarbons. The method does not differentiate recent biogenic from non-biogenic material. ASTM is currently working on a technique to solve this problem. As part of IDOE-5 a round robin experiment has been organized on hydrocarbons added to cod liver oil. Results of this experiment indicate that aliphatic hydrocarbons in the range $\underline{n}$-C_{16} to $\underline{n}$-C_{28} are apparently stable over a two-year period if stored frozen with intermittent thawing for sample removal. There is currently a proposal for funding of a joint USSR-USA intercalibration program as part of IDOE. An SRM has already been issued by NBS for trace elements in fuel oil; trace elements in a sediment are currently being certified. A tuna fish research material is available from NBS for trace element intercalibration. This material has also been used by some laboratories for hydrocarbon intercalibration, but no hydrocarbon homogeneity check has been performed on the material by NBS.

Numerous problems exist in releasing even a research material for hydrocarbon intercalibration purposes. First, microorganisms can degrade crude oil, so they must be carefully excluded from any intercalibration material to avoid a change in its composition with time. Second, there are many laboratories performing hydrocarbon analyses and each laboratory has a different objective and different analytical method. The parameters determined are as variable as source identification of waterborne oil, µg/kg (baseline) hydrocarbon determination with or without single compound identification and quantitation, polynuclear aromatic hydrocarbon determination and volaile hydrocarbons (C_1-C_{10}) determination. The analytical methods differ in sample preparation and instrumentation. The end result is determined by any one of the following means: IR, UV, GC, LC, GC-MS, colorimetry and gravimetry. Given the current state of the art each method has a different bias and hence, yields somewhat different answers. It was suggested at the workshop that NBS specify acceptable or advisable techniques when sending out samples. It was further suggested that in all cases two samples would be desirable - a synthetic sample (SRM) certified for hydrocarbon content and a natural sample certified only for homogeneity. A suggested source for natural samples was Coal Oil Point, a known seep site near Santa Barbara.

B. Matrix-free SRM's

Several people expressed desires for matrix-free hydrocarbon SRM's. These requests fell into two classes: a) pure compounds and b) reference oils. Included in the first category were: pure n-octadecane, pure phytane, and pure representative aromatic hydrocarbons. Also included in this group were requests for mixtures of pure, representative compounds in an organic solvent (∿10 ppm) and a synthetic oil composed of a mixture of pure compounds. Requests in the second category included: reference oils for "fingerprinting" purposes, weathered oils from controlled weathering experiments (1 day and 3 day), and a series of oils such as the API "reference oils." Finally, since oil concentrates metals and pesticides, it was suggested that an oil certified for these constituents be considered as a candidate SRM.

C. Matrix-bound SRM's

1. Water SRM

There was considerable interest in trace organics in water SRM's. However, the general consensus was that the release of this SRM would be extremely difficult due to problems in stabilizing the SRM, probable large volume of the SRM and adsorption on container walls of trace constituents. Interests included drinking and waste water standards, and ocean water standards (several salinities) spiked with a reference petroleum at different concentrations (1, 5, 10 μg/l and 100 ng/l, suggested).

If one can produce a standard with the C_1-C_{10} hydrocarbons present, $HgCl_2$ should be added to prevent biodegradation. Due to possible adsorption losses, user made dilutions of the most concentrated standard would not be an acceptable means for making the more dilute standards. If a water sample is released it was suggested that one specify acceptable sampling techniques and analytical techiques, as well as blank handling procedures.

2. Sediment SRM

Although there was great interest in a sediment SRM, the only request for a specific material came from BLM. They would desire two standards, one at 200 ppb and one at 1000 ppm. Several people presented results of their research which would be helpful in feasibility studies for a sediment SRM. It is not currently known how hydrocarbons are held onto sediments. Possible means of stabilizing a sediment SRM include freeze-drying, radiation sterilization, and shipping under N_2. There is some evidence that dry sediments decompose faster than wet sediments. At 60 °C there is a finite amount of decomposition over a period of weeks. If one uses solvent extraction procedures, freeze-drying will not affect the hydrocarbon content of the sediment sample (since both freeze-drying and solvent concentration result in loss of the more volatile hydrocarbons). Finally, sediment acidification enhances the yield of solvent extractable material.

3. Tissue SRM

The requests for tissue SRM's also fell into two classes: a) compounds spiked into a lipid matrix and b) marine tissue containing trace level petroleum constituents. The IDOE-5 study has shown that a distillate crude is stable in cod liver oil for 3 years when stored frozen with occasional thawing for sample removal. A proposal was made that NBS release a lipid SRM containing hydrocarbons, as well as some of the characteristic nitrogen and sulfur compounds from petroleum. As far as actual tissue SRM's are concerned, there is no known ideal bioindicator species, but Mytilus seems to be the best currently available. Most people considered it important to have the whole tissue

SRM so that all the interfering biogenic compounds would be present. There was disagreement over issues such as release of whole organism vs individual organs, frozen vs freeze-dried tissue material, and biological incorporation vs laboratory spiking of marine tissue. As far as hydrocarbon concentration in a tissue SRM is concerned, the Bureau of Land Management recommended two standards, one at 4 ppm and one at 2000 ppm (total extractable hydrocarbons, including biogenics).

II. Recommendation Resulting from the Workshop

At the conclusion of the workshop, five SRM's were recommended by the participants for NBS consideration. These SRM's in order of decreasing priority are as follows:

1) natural sediment certified for trace elements and hydrocarbons;
2) biological tissue certified for trace elements and hydrocarbons;
3) a synthetic mixture of pure organic compounds contained in a pure lipid or an organic solvent.
4) a reference crude oil;
5) sea water certified for trace elements and hydrocarbons.

The sea water SRM was given lowest priority because of the presumed difficulty in preparing it, not because it was necessarily the least desired SRM.

NOTE: This report has been formally printed as Natonal Bureau of Standards Technical Note #889. Since the annual reports are in press the formal edition is not included.

ANNUAL REPORT
July 1975 to April 1976
Environmental Assessment of Alaskan Waters
-Trace Element Methodology-
Inorganic Elements

A. Introduction

The research reported here is directly related to Task A-33, to determine the content of selected trace metals in the water column, suspended particulate matter and bottom sediments. A part of this includes Task A-32, a survey of the available literature (including an evaluation for data on the concentration and distribution of selected trace elements.

A portion of the acquired data may be used as a part of Task B-11, to characterize chemically sediment influx and deposition and all of the data may be used as a part of Task E-2, to predict possible short and long-term environmental effects of possible oil and gas development.

For practical purposes the progress reported here is divided into three main areas:

1. The results of the literature survey and the evaluation of this survey.
2. The collection of samples and the analyses of these. This section includes data obtained on sample containers and the cleaning of these.
3. Data on the possible determination of speciation in ocean water and sediments. This was not a part of the original proposal but was discovered during this research and has been pursued as time permitted.

B. Progress

1. Literature Survey and Evaluation.

As described in our original proposal, a literature survey as well as an examination of existing sample collections was in progress as a part of a program entitled "The National Environmental Specimen Bank", sponsored by the Environmental Protection Agency and NBS. This survey has been completed and an evaluation completed. The general evaluation and references are included as appendix A. A summary of the results are as follows: Nearly all previous results of the concentration of trace elements in ocean waters, suspended particulate matter and sediments must be treated as suspect. Most of these results are probably worthless. This is the result both of the lack of trace element methodology of sufficient accuracy as well as a general lack of knowledge of the concentration of trace elements in the reagents used, in the containers used for collection and storage and in the laboratory environment used for sampling and analysis. Fortunately, this state has improved greatly in the past year. Improvements in the methodology and instrumentation have increased the precision and, most important, the accuracy which may be obtained. This is true for the three most commonly used analytical techniques, Graphite Furnace Atomic Absorption, (AAS), Anodic Stripping Voltammetry (ASV) and Activation Analysis (NAA). As an example of this, we have recently analyzed a water sample of known trace element concentration by AAS. The concentrations of 17 elements were determined either directly, or for three elements, with a ten-fold concentration (i.e. 10 μl total sample) with results that were accurate to ±3%. All elements were in the low ppb range.

3

The greatest remaining problem lies in contamination by the sample containers and/or the analytical environment. As a result of a study of the content of trace elements in containers and cleaning methods we are able to suggest both suitable containers and cleaning procedures that are adequate. This is treated in detail in Section 2 below. It is now evident that contamination from the laboratory environment can only be prevented by the use of the most stringent precautions inlcuding the use of class 100 laboratory space either as complete laboratory facilities or by means of small portable laboratory benches.

2. Collection of Samples and Analyses.

a. Sample Collection

One sample collection consisting of about 38 samples was made by NBS personnel near Glacier Bay. These samples were all acidified and frozen within one hour of collection, shipped frozen and kept frozen at NBS until analyses time. We had intended that part of this collection be filtered at the time of collection but unfortunately the filtering devices would not work properly in the cold conditions and there was not time to either repair the units or to use an alternate system we had prepared.

We received a second set of 8 samples hand-carried by Dr. D. Burrell. These had been acidified but not frozen. Additional samples sent to arrive coincident with Dr. Burrell were delayed by the airline and were ultimately received in bad condition. The worst of these were discarded, the rest used only for testing of various analytical techniques.

An additional set of samples sent by Dr. Burrell were received in good condition, still frozen and have been kept frozen until analysis time. The list of samples is shown as Table one.

These samples are being analyzed by AAS and NAA. The analyses are not yet complete but are on schedule. We plan to cross check several analyses by isotope dilution mass spectrometry.

b. Container and Cleaning Study

A complete report of the study of suitable containers and a suggested cleaning procedure is shown as Appendix B. We recommend that teflon or conventional polyethylene bottles be used and that the bottles be cleaned according to the method given. In addition, to prevent the loss of moisture from the polyethylene bottles or the transport of volatile metals (i.e. mercury) into the containers that they be kept either frozen or in bags made of polyethylene coated-aluminized mylar. This material is readily available, inexpensive and may be easily heat sealed.

3. Speciation Studies

During the course of the analytical program we analyzed several samples by a new method called Dual Plasma Emission Spectrometry developed in our laboratories. The details of this method and the instrumentation used is shown in Appendix C. During the analysis we discovered that we can identify at least two forms of mercury and chromium in varying amounts in the sediment and sea water samples. We believe that one of the mercury forms is methylmercury and the other is inorganic (probably mercuric chloride). The chromium species are as yet unidentified. We believe that it is possible with future work to identify and quantitatively determine these species and possibly others.

C. Suggestions for Future Work.

1. Storage, Analyses and Standards.

We believe that, given the present state of knowledge of the trace element concentration in ocean water and sediments, research should be conducted into the proper methods of collecting and preserving samples. We have initiated some work in this area and are currently preparing to collect several hundred gallons of clean sea water. We will study the effects of freezing, freeze-drying and additions of acids and noble metal preservatives on the loss of trace elements. The goal of this work would be a recommended method of collection and storage and, most important, to provide standards for analyses.

2. Speciation

Additional work should be done to determine the speciations of as many metals as possible but particularly mercury, chromium and tin in water and sediment samples. This will have important effects on our knowledge of the ultimate fate of trace element contamination of the natural environment.

Table 1

Alaskan Samples from University of Alaska

Sample	Size	Container	Description
Water	1 liter	Polyethylene bottle	NBS-000-25
Water	"	" "	Duplicate W.G.A. Station 146 Bottom 10/11/75 Filtered, Acidified
Water	"	" "	NBS-000-5
Water	"	" "	NBS-000-50
Water	"	" "	NBS-000-0
Water	"	" "	NBS Duplicate W.G.A. Station 133 Bottom 10/12/75 Filtered, Acidified
Water	"	" "	NBS Duplicate W.G.A. Station 120 Surface 10/13/75 W.A.
Water	"	" "	NBS Duplicate W.G.A. Station 121 Surface 10/13/75 Filtered, Acidified
Water	250 ml	" "	MB 69 Surface OF Duplicate
Water	"	" "	#59 30M Filtered, Duplicate
Water	"	" "	046 Surface, Filtered Duplicate
Water	"	" "	046 Surface Unfiltered, Duplicate
Water	"	" "	#59 30M Unfiltered, Duplicate
Water	1 gallon	Poly-"Cube tainer"	W.G.A. 158-5 Unfiltered, Acidified

Sample	Size	Container	Description
Water[a]	1 gallon	Poly-"Cube Tainer"	Bering Sea MB-46-0 M NBS Duplicate
Water[a]	"	" "	Bering Sea MB59-5 30 M NBS Duplicate
Water[b]	1 liter	Polyethylene bottle	EGA 15 11/27/75 1500 M Filtered, Acidified
Water[b]	"	" "	WGA 110 11/30/75 173 M Unfiltered, Acidified
Water[b]	"	" "	EGA 24 11/25/75 410 M Unfiltered, Acidified
Water[b]	"	" "	EGA 11 11/29/75 1350 Filtered, Acidified
Water[b]	"	" "	1500 M 11/27/75 Unfiltered, Acidified
Water[b]	"	" "	WGA 110 11/30/75 173 M Filtered, Acidified
Water[b]	"	" "	EGA 24 11/25/75 410 M Filtered, Acidified
Water[b]	"	" "	EGA 11 11/29/75 1350 M Unfiltered, Acidified
Sediment[b]	500 ml	Wide Mouth Poly Btl	Bering Sea Station 54
Sediment[b]	"	" " " "	Burrell Station 32-2-6C Eastern Gulf
Sediment[b]	"	" " " "	Bering Sea Station 19
Sediment[b]	"	" " " "	119 M EGA 55 Burrell Station 55 Eastern Gulf 11/29/75

Sample	Size	Container	Description
Sediment[b]	500 ml	Wide Mouth Poly Btl	Eastern Gulf Station 25-1-6C Silas Bend
Sediment[b]	"	" " " "	Bering Sea, Station 60
Sediment[b]	"	" " " "	Bering Sea Station 63
Sediment[b]	"	" " " "	Burrell, Eastern Gulf Silas Bend
Sediment[a]	250 ml	" " " "	Station 42 HAPS Cove 0-6 cm Gulf of Alaska 42-1-6C

[a] Presently being used by Dr. Hanamura.

[b] Stored in freezer.

APPENDIX I

Literature Survey on Sampling, Sample Handling, and Storage for The National Environmental Specimen Bank

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Approximately 660 of the returned survey forms sent out by ORNL for the NESB have been studied and evaluated at least two times with regard to the suitability of the specimen collection for sample integrity after long term storage. Few of the survey respondents answered the questions in sufficient detail to give a definitive answer, but most of the collections appear to be of use largely for taxonomical purposes.

In order to develop a consistent and comprehensive set of guidelines for the evaluation of this survey, a large portion of the recent literature concerning sampling and storage of environmental specimens has been examined. This has been done both manually and by use of bibliographical retrieval services such as Medline, Chemcon, Biosis, Cain, Defense Documentation Center and others. Also, the advice and opinion of workers in various aspects of the field has been obtained. A summary of the results of this survey is found below, separated into the various areas of concern.

Trace Elements

For trace elements there is an abundance of reports on sampling and storage (which should also apply to radionuclides);

however, many of them are contradictory and should be further resolved by careful experimental work. Much of the published analytical data apparently is inaccurate because of such problems as gross sampling contamination or subsequent procedural contamination and failure to make proper blank corrections. Richards states that some oceanographers have permitted the perpetuation of the notion that the concentrations of the sea are well known, when, in fact, they are not (1).

Patterson and Settle (2) report that the great mass of published lead data in plants, animal tissues and water is in error because of gross positive errors, and that the relatively large blanks usually present with lead concentrations less than a few μg/g often makes the value obtained meaningless. Many trace element analysts, particularly in the field of oceanography and marine biology, believe that much of the previously published work is unreliable as a result of sample contamination. The values being reported are progressively lower as techniques are being improved. Hume reports that if a synthetic sea water were prepared from the purest reagent chemicals available, it would still be higher in many trace elements than natural sea water (3). Whitnack also has evidence to show that the reagents used are more contaminated than sea water (4). Speecke, et al. state that many chances exist for a biological material to be contaminated before it is analyzed (5); but few authors give the impression of the awareness of this and that meaningless phrases are used, such as "metal-free" containers, "chemically clean" glass, etc., with no evidence to back it up. Berman states that one must never assume anything is acceptably free from trace metal contaminants until it has been tested (6).

It is felt that the materials, techniques, and expertise exist to provide viable long-term stored samples for most trace elements in most matrices; however, few in the field are using these techniques, partially because as Boutwell says, "...validity is an expensive commodity" (7).

The first consideration is the choice of the container and sampler composition and the method of cleaning and sampling. Murphy, Robertson, Thiers, Patterson, Tölg, and many others show results which indicate that rubber, neoprene, vycor, polyvinyl chloride, polystyrene, glass, polypropylene, linear polyethylene, platinum, etc., will introduce contamination in sampling and storage (8, 9, 10, 10a, 2, 11). Patterson recommends first, FEP Teflon, then ultrapure quartz, conventional polyethylene or TFE Teflon containers. All cleaning and sample treatment should be done in laminar flow hoods or a clean room. He recommends cleaning with hot concentrated HNO_3 for three days, rinsing with high purity distilled water, followed by hot dilute 0.05 percent HNO_3 (both water and acid, prepared as described by Kuehner, et al. (12)) for one day, rinsing and heating with 0.05 percent HNO_3 five days, rinsing, then storing filled with 0.05 percent HNO_3, wrapped in cleaned polyethylene until ready for use. (The two dilute HNO_3 leachings have not been found necessary by some other workers). When ready for use, the containers can be thoroughly rinsed and dried in laminar flow hoods. Cleaned plastic gloves are worn in all phases of cleaning, sampling, etc. (2). Berman found that even after thorough cleaning and scrubbing of fingers, 0.1 to 0.4 μg of lead could still be washed off. Washings from a chain smoker give results of 0.3-4 μg of lead (6).

Karin, et al. report a three-day leach of polyethylene in either 8 or 16 M HNO_3 was necessary to remove certain trace metal contaminants (13).

Sampling implements Patterson recommends are either Teflon or Teflon-encased, except for frozen tissue sampling where a series of HNO_3-acid cleaned stainless steel blades are used with very elaborate sampling procedures to remove areas contaminated by the blade (2). All of these type operations should be done in laminar flow hoods or clean room conditions.

Deionized water which has not been followed by distillation should not be used in any stages of the cleaning, sampling, or analysis as organic breakdown products may be formed, complexing some of the trace elements (8).

Numerous types of water samplers have been devised. Segar, et al. have described water sampling with Niskin bottles with rubber coated springs, Teflon coated coil springs and a new design Niskin bottle without internal closures. All gave trace metal contamination except the latter (14). Since Teflon is rather porous, apparently some metal diffusion through the spring coating must have occurred.

Harrison, et al. have designed a Teflon cylindrical sampler with a mechanism for opening both ends after submersion to the desired depth to avoid contamination from the water surface (15). It is attached to a metal frame and rudder which have a baked-on Teflon coating. It is also adapted so that the sample may be filtered immediately in an attached container holding a precleaned polyethylene bag in which the sample can be immediately sealed and frozen in liquid nitrogen. If the water sample is to be filtered, Morrison and Pierce, and many others suggest that it is best to do it immediately (16). The filter must be thoroughly precleaned, rinsed, and stored in cleaned polyethylene bags.

The sample chamber used by Patterson (2) consists of accordion pleated Teflon tubing, the entry port being protected by a bath of ultra pure water (prepared as already mentioned). At the deep water sampling depth desired, a trigger retracts the water bath shroud and ruptures the end diaphragm which contains the pure water. The water sampler is lowered continuously so that it is continually dropping into virgin water. After a short interval to allow the bath water to be washed away, a second trigger expands the sample accordion bag and seals the entry port.

The storage of aqueous samples presents an even greater challenge as most samples start undergoing changes the instant they are sampled. Pre-aging the sampler and sample container with some of the same sample would be desirable whenever possible. Amore states that losses as high as 50 percent can occur during one hour of storage (17). An EPA manual on methods of water analysis says that complete and unequivocal preservation of samples is a practical impossibility, that complete stability can never be obtained, and that preservation techniques only retard the chemical and biological changes that continue after the sample is taken (18). The methods of preservation are intended to retard biological action, retard hydrolysis of chemical compounds and reduce the volatility of the components. Their recommended methods include pH control, chemical addition, refrigeration, and freezing.

Although there is much in the literature on relatively short term storage of different aqueous (non-frozen) solutions under varying conditions, there are many disagreements and most of the results do not look favorable for long term storage. A USGS manual for water analysis says that the shorter the time that elapses between the collection of a sample and its analysis, the more reliable will be the results (19).

Pettis and Phillip give an excellent review of the literature on trace metal analysis in sea water. They discuss sampling and cleaning procedures, sample pretreatment, standard reference materials, and analytical method of determination of the trace metals (19a).

Robertson found that sea water adjusted to pH 8 stored in polyethylene resulted in a 90 percent indium loss in 20 days and a 90 percent loss of iron in 55 days (20). Hummel found that 75 percent of the gold in sea water was lost after three weeks in polyethylene (21). King, et al. found that less than 3 percent of the cadmium was lost to polyethylene at pH's of 3 to 10 after two weeks storage (22). West, et al. (23) found more silver adsorption on glass at pH 4 than at pH 7, a significant decrease occurring at pH 7, and a rise at pH 8, and they also state that pyrex showed more erratic adsorption patterns than polyethylene or silicone-coated containers. Struempler (24) states that acidification with nitric acid to pH 2 prevents adsorption of silver, lead, cadmium, and zinc on pyrex, and silver on polyethylene. Dyck (25) reports lack of confirmation with the work of West, et al. with silver, and states there is a direct increase in silver adsorbed on glass with increase in pH. He also states that for periods over several months, plastic adsorbed more silver than glass. Lai and Weiss (26) found no silver loss when sea water was stored in polyethylene and acidified to a pH of 3.5 to 4.0 with acetic acid. King, et al. (22) found losses as high as 75 percent for cadmium when stored in glass at pH 9. Eichholz, et al. (27) compared adsorption of a number of elements on pyrex and polyethylene and state that pyrex is preferable to polyethylene; however, they found less contamination for cesium, ruthenium, and zirconium when using polyethylene. Smith (28) studied stability of a number of ions including cadmium, antimony, tin, and lithium, and states that of the elements studied only lithium was stable over the pH range of one to 11. He therefore recommends acidification to pH one. In another report (29), he states that freezing the liquid samples as soon as they are collected is an excellent solution for the adorption problem. The losses may be due to adsorption or also to precipitation or particulate formation. Salman also states that freezing can be used to preserve the water samples at the collection site (29a).

Rattonetti examined the stability of a large number of trace metals in a variety of water matrices stored in polyethylene at differing pH's and concluded that loss to container walls is insignificant compared to losses to the particles present in natural aqueous systems (30).

Moody, et al. have prepared two mercury in water Standard Reference Materials at the 1 ppm and 1 ppb level which have been stable for over a year in both glass and polyethylene (31). This was achieved by the addition of 10 ng/g of Au^{+3} and 0.5 N nitric acid. Lo and Wai verified this for shorter term storage with 0.2 µg/g Au^{+3} and nitric acid at pH 0.5 (32), but were unable to confirm Feldman's stabilization with potassium dichromate (33) or the report of Issaq and Zielinski with hydrogen peroxide (34). Avotins and Jenne state that the biological effects have been overlooked in many of the mercury in water investigations, and that as a result of the unpredictable growth of bacterial and yeast populations, with production of metabolites, mercury may either vaporize, bind to the walls of the vessel or be stabilized in solution (35). Huey, et al. have reported that cadmium can be volatilized from its inorganic salts by a microorganism through conversion to a volatile organic compound (36). The volatilization is stimulated by vitamin B_{12}. Methylmercury formation by this organism is also stimulated by B_{12}, the absence of which causes the organism to form metallic mercury from inorganic mercuric salts. In samples where this type of reaction occurs, freeze-drying is not advisable as a method of sample preservation. For long term preservation for trace-element analysis, freezing and possibly freeze-drying for most elements (probably followed by radio-sterilization), would seem to be the most likely alternatives. Morrison and Pierce state that freezing may be a suitable preservation technique for trace elements but has not been adequately tested to date (16). Allen, et al. recommend immediate freezing at -10 to -15°C to prevent microbiological changes in soluble mineral and silica concentrations (37); however, for long term storage, immediate freezing in liquid nitrogen as recommended by Harrison, et al. (15) and others (29), followed by freeze-drying for most trace elements (and radiosterilization) or storage at -70° to -80°C would seem preferable. Low temperature (oxygen plasma) ashing and dry ashing are also possibilities in some cases.

Harrison, et al. (38) and Filby, et al. (38a), have reported that radioisotope studies of the volatile elements such as arsenic, antimony, selenium, bromide, and mercury have shown no significant losses in water samples which have been freeze-dried.

Heron studied the determination of phosphate in lake water before and after freezing (39). It was expected that rapid freezing would cause cell rupture resulting in higher phosphate values, but this did not occur. Varying phosphate values were found whenever growth of bacteria was occurring. This was prevented by pre-cleaning the sample bottle with a solution which is 5 percent in iodine and 8 percent in potassium iodide and immediate freezing of the water sample.

Philbert found that in freezing lake water samples soluble reactive silica and phosphorus concentrations were decreased in the thawed samples (40). A decrease in total alkalinity and dissolved chloride was also observed. Inconsistent changes were observed for ammonia and the various forms of nitrogen.

A USGS manual on methods of water sampling recommends that water samples for inorganic analysis should not be frozen (19); however, there is sufficient reason to expect that if the process is performed properly, freezing is acceptable for most trace elements. The samples should be subsampled before freezing, because once thawed, they should not be refrozen. The entire subsample should then be taken for analysis. They should be frozen in one of the container materials already discussed, under a gas such as nitrogen or argon to prevent sample oxidation. They should be sealed in at least 2 and possibly 3 [as Patterson recommends (2)] series of plastic bags. Since most plastics are porous (41), they should then be placed in a tightly sealed glass container containing nitrogen or argon with minimum void space, followed by storage in the dark at -70°C. Bothner and Robertson (42) have reported that sea water samples stored in polyethylene containers have picked up mercury from being stored in a room contaminated with metallic mercury. This has been verified in a closed chamber with pools of clean mercury surrounding a mercury solution in Teflon and polyethylene bottles, but has not as yet been verified in an ordinary laboratory atmosphere where spilled mercury would probably be covered with dust, thus effectively diminishing its vapor pressure (43).

When the frozen water sample is used, the whole sample should be used because of possible selective ion incorporation in the ice (44). The walls of the inner container will probably have to be washed with acid to remove any hydrolyzed or adsorbed material.

The possibility of losing organic or inorganic mercury during freeze-drying of biological materials was investigated by LaFleur, as Pillay, et al. had published data indicating losses (45). LaFleur found no losses for inorganic or naturally bound methyl- or phenylmercury in tissue and blood; however, for aqueous solutions, losses of up to 90 percent could occur for organic and up to 10 percent for metallic mercury (46).

Biological-Tissue and Fluids

For tissue and biological fluid sampling, the sampling device presents considerably more difficulties. The use of a laser beam for cutting bone by Hislop and Parker (47) offers many interesting possibilities. Some loss of trace elements on the surface may occur but would be negligible with regard to the entire sample. A quartz or glass knife should also be suitable for many kinds of tissue. Montgomery, et al. used a glass knife to cut fish in small pieces for the determination of iron, zinc, lead, cadmium, copper, and manganese (48). A problem here is the chipping of the cutting edge; weighing the knife before and after use may indicate if this is a problem.

Most workers use stainless steel implements. However, this is frought with dangers of contamination for many trace elements even when done as carefully as described by Patterson earlier (2). Versieck, et al. report on the contamination introduced during needle biopsies of liver (49). They state that steel surgical blades lead to somewhat less contamination, but are not suitable for some trace elements such as chromium and nickel. The needle biopsies resulted in contaminations of as much as 1.7 ppm of copper, 0.64 ppm of manganese, 11 ppm of chromium, 12 ppm of nickel, 20 ppm of iron, 0.24 ppm of cobalt, 0.012 ppm of silver, 0.46 ppm of tin, 0.069 ppm of antimony and 1.2 ppm of tantalum. Speecke, et al. have reported on the sampling and storage of biological materials for contamination by chromium, manganese, nickel and cobalt by drawing 4 series of 20 ml portions of blood using disposable needles (5). For manganese, the first 20 ml showed contamination of 0.2 ppb, the fourth, 0.02 ppb; for chromium, the first 85 ppb, the fourth 15 ppb; for nickel, the first 71 ppb, the fourth 12 ppb; for cobalt the first 0.9 ppb, and the fourth 0.2 ppb. They also compared contamination introduced in another series of liver samples using Meneghini biopsy needles and surgical blades. For the needles, they found contaminations of as much as 600 ppb of manganese, 9000 ppb of chromium, 12,000 ppb of nickel and 230 ppb of cobalt; for the surgical blades, 3 ppb of manganese, 15 ppb of chromium, 60 ppb of nickel, and 1 ppb of cobalt. They discuss the possibility of using laser beams on hard and soft tissues and platinum-rhodium alloy needles; however, it is preferable that the platinum needles have Kel-F hubs to avoid contamination. For storage, Speecke, et al. recommend immediate, rapid freeze-drying, but point out that some volatile materials may be lost. All the work should be done in a clean-room type laboratory with no exposed metal parts which might cause contamination.

Fisher, et al. (50) also reported that serum samples should be quickly frozen with as little air space as possible (as described earlier, the air should be displaced with nitrogen or argon). They also checked storage at room temperature, 8°C and -15°C. No differences for calcium, magnesium, copper, zinc, sodium, and potassium were noticed up to 16 days. Essentially no changes were observed in the refrigerated and frozen samples up to 50 days, but changes did occur in the samples stored at room temperature. Longer term storage would probably also result in changes in the refrigerated samples. Some microorganisms can grow in a temperature as low as -6°C (51).

In a discussion of sampling for clinical chemistry, Ibbott recommends separating the serum from the clot as soon as possible to avoid contamination from cell leakage (52). He also states that the majority of the serum components are stable indefinitely in dry ice (about -70°C), and that the samples exhibit concentration gradients due to freezing and must be thoroughly mixed after thawing. Omang and Vellar also point out the concentration gradients obtained after freezing and thawing serum, sweat, and urine. They found top-bottom differences of thawed samples of up to one hundred (53).

Museum Specimens

The futility of trace element analysis of museum type specimens stored in preservatives has been pointed out by a number of authors. Bowen and Sutton in analysis of marine sponges found that nickel accumulation in the preservative occurs quite frequently in these types of samples (54). Gibbs, et al. investigated the effects of time and preservatives in museum fish specimens and found no evidence to support the theory that preserved museum specimens can provide reliable estimates of heavy metal concentrations (55). They tested many types of preservatives such as ethanol, formalin, isopropyl alcohol, etc., and found interaction with the specimens in all cases. They may either leach trace metals from the specimen or contaminate the specimens by heavy metals contained in the preservatives or container. In many cases, metal identification tags are placed in with the preservative, which contribute even further to the contamination of the sample. In some instances, the trace metal content increased over the years and in other cases, decreased from leaching even in a short period of time, such as a month.

A possible exception for the museum type specimens are those which have been stored in relatively clean, dry areas not subject to leaching or contamination. Cockburn, et al. (56) describe the autopsy of an Egyptian mummy, Pum II, which included the analysis of some trace elements in bone by R. G. Smith (57). He found 0.6 ppm of lead and 0.43 ppm of mercury. The lead content of modern bone averages 6.55 to 18 ppm (58). Assuming no leaching has occurred, it would appear that man's environment has contributed considerably to his lead body burden. The mercury level is relatively unchanged, that of modern bone averaging about 0.45 ppm (59).

Crustal and Botanical Materials

The sampling and storage of soils, rocks, minerals, sediments, and plants does not present quite as many problems as the matrices already discussed, but more precautions should be taken then are generally observed. Morrison and Pierce (16) state that the use of a spade to sample soil is preferable to a soil auger and that dry samples can be collected in a clean cloth bag, but this procedure would certainly lead to contamination for some trace metals. Clean Teflon encased tools as recommended by Patterson and Settle (2) should be used except for most plants which can be picked with clean plastic gloves. It appears that soils and sediments with any significant water content (especially sediment samples) should be frozen in such a way that no water loss can occur, and stored as recommended for water samples.

There are many papers in the literature which indicate that soils and sediments undergo changes in structure and chemical state even when dried at room temperature. This should not have a great effect on the total trace element content in most cases, but if speciation, organic extractable trace elements, etc., are of interest, any form of drying may invalidate the sample. Attoe (60) reports that potassium may be fixed in a nonexchangeable form when a potassium-fertilized soil is air-dried. Air drying of unfertilized soils resulted in a 4-90 percent increase in exchangeable potassium when the soils are remoistened. Schalsha, et al. (61) state that air drying produces significant irreversible changes in volcanic ash soils. For instance, soil samples with a clay-type texture in the field, change to a sandy texture with air drying. Air drying also reportedly markedly affects cation exchange capacity, soluble phosphorus and iron, and decreases the pH slightly. Air drying decreased the total exchangeable and acid soluble iron, but increased the chelatable iron extracted by salicylate. The mechanical and chemical analysis of volcanic ash soils more accurately indicate field conditions when samples contain the original moisture at field capacity.

Barrow (62) found when soils were dried, inorganic sulfate immediately increased (probably as a result of decomposing organic sulfates in the soil becoming immediately available to the plants). Even when two different soils are dried at the same temperature, the relative availability of the sulfur may be no indication of the relative availability when they were fresh.

Harpstead and Brage (63) reported that the drying and storage of soils leads to a pronounced increase in their nitrifying ability because of the changes in the relative numbers of various microorganisms in the soil. Birch found that when remoistening dried soil, the first rapid decomposition slows down and this pattern is repeated during successive dryings and wettings (64). The magnitude of the decomposition depends on the amount of carbon in the soil and on the drying conditions, air drying being less effective than oven drying. Vacuum drying and oven drying gave the same moisture loss results, but oven drying gave a much greater amount of decomposition on rewetting.

Birch (65,66) also states that the longer a soil is kept air dried, the greater the amount of water-soluble and organic material that can be extracted, even though it does not lose additional moisture, and also the greater the amounts of carbon and nitrogen are mineralized on remoistening. He also finds greater effects if the soil is dried at 100°C, possibly because of increased gel porosity and surface area, and possibly because of increased microbiological activity occurring during the remoistening of the dried soil.

Nevo and Hagin (67) state that the changes occurring after three months of air drying storage was independent of microorganisms. The major factor is the change in the physical structure of the organic fraction. They found a good correlation between the nitrification rate and the surface area of particles of an organic soil.

Hesse (68) states that oven drying a soil, despite its reproducibility, should not be recommended, because of the profound changes caused. Also he says that storing a soil in a moist state has the effect of incubating it, but without temperature or moisture control, resulting in a build-up of carbon dioxide at the expense of oxygen. As such treatment results in many complicated reactions, it is most undesirable to keep a soil in a moist state for any length of time for the purpose of analysis. He also reports on investigations of J. M. Coleman (private communication) that moist soil samples stored in plastic containers can result in fundamental changes in clay minerals. It is thought that an organic complex passes from plastic into the clay mineral. All these references seem to point out that drying or freeze-drying may result in irreversible changes which will affect also the complexation state of the trace metals and that freezing at -70°C to -80°C as recommended earlier should be the method of storage.

Plant sampling can probably be done by picking with plastic gloves and storing by freezing in containers as already mentioned, with care to avoid moisture loss.

Arkeley, et al. (69) state that trace elements such as carried by peat dust deposited on plants are easily washed off (high purity distilled water should be used) but those deposited by sprays are not, because of partial absorption in the leaf. Lagerwerff (70) found increases in absorption of cadmium, zinc, and lead on leaf surfaces probably enhanced by drying.

Work by Koeppe and Miller (71) showed a much higher uptake of lead by maize roots than in the stems or leaves.

Washing with distilled water removed little lead, but washing with EDTA solution removed about 90 percent of the lead, indicating the lead is largely retained on the exterior surface of the roots.

For sampling of air particulates, Patterson and Settle (2) recommend cleaning Millipore or Nucleopore filters by soaking in cold 6N HCl two days, rinsing on a cleaned polyethylene Buchner funnel with high purity distilled water, soaking two days at 55°C with 1 percent NH_4F (prepared by neutralizing high purity NH_4OH with high purity HF) followed by rinsing with high purity water. These operations, of course, are carried out in a clean room atmosphere or laminar flow hoods. The filters are then stored in cleaned polyethylene bags or boxes. The lead blank on these filters was found to be less than 1 ng/47 mm filter.

Organics and Pesticides

With the exception of the use of plastic gloves for sampling to avoid contamination from body oils (72), storage containers and implements for trace organics and pesticides must definitely not be plastic of any kind with the possible exception of Teflon, as plastic is known to both introduce interferences and sorb pesticides (and organics) (73,73a). Many examples are given in the literature which show that additives such as plasticizers, organo-metallic or other stabilizer antioxidants, colorants or other components are leached from the plastic and contaminate the sample (74).

Some polyvinyl chloride tubings were shown to release a constituent to some systems containing alcohol, propylene glycol or polyethylene glycols (75). Gibbs found that asbestos fiber was highly contaminated by 3,3'-5, 5'-tetratertiary butyl diphenoquinone after storage in polyethylene bags (76). Lipids in soil samples stored in standard plastic lined canvas bags were found to take up phthalate esters and other contaminants from the plastic (77).

Most workers in the field recommend storage in glass containers with Teflon or aluminum foil lined caps (72,73,73a,78); however, it has been reported that Teflon sheet and aluminum foil have been found to contain up to 400 and 300 ppb, respectively, of di-2 ethylbutyl phthalate (79,80).

Hertz, et al. (81) recommended cleaning the glassware with soap and water, then in concentrated H_2SO_4 at 100°C for 30 min and finally rinsing with specially prepared distilled water made by redistilling the house distilled water over $KMnO_4$-KOH. The distillate is then passed through an XAD-2 column, and the water is redistilled to remove any particulates from the XAD-2 resin. Finally, the bottles are then rinsed with methanol and triple-distilled pentane, and filled with nitrogen from a liquid nitrogen source and sealed.

Others recommend wrapping the cleaned glassware in aluminum foil and heating at 625°C for four hours (82). The maintenance of high quality distilled water can be a problem as some microorganisms can grow rapidly in distilled water and some chemical reagents (82,83,84). It is reported by Hamilton and Myoda (82) that the amino acids, proteins and bacteria often found in some laboratory reagent solutions and distilled water, are probably airborne and enter the outlet of the stills or deionizing systems where they multiply. A method of catalytic pyrodistillation has been reported to remove organic impurities not removed by ordinary or oxidative distillation because of the steam volatility of the compounds or their derivatives (85).

It has been recommended in sampling that "an analyst or person directly concerned with the particular study should collect the samples. Inexperienced personnel should never be allowed to collect the samples unless they are very closely supervised" (78). This, of course, is true to all types of environmental sampling.

When sampling marine organisms and sediments for organics or pesticides, most workers recommend freezing immediately in dry ice or liquid nitrogen (72,81) and final storage at about -70° to -80°C (86) in the dark. Breakdown of pp'-DDT to pp'-TDE in Bengalese finch liver, and breakdown due to other biological processes have been reported at home freezer storage conditions (approximately -14°C) (87,88).

Bristol reported in a study of pesticide residues in potatoes that metabolically incorporated 2,4-D untreated potato samples stored whole at 4°C decreased over a period of 15 months, while those of 2,4-DCP remained constant. Recoveries of 2,4-D from frozen samples were constant over a 15-month period, but those of 2,4-DCP decreased slowly from 88 to 47 percent. The 2,4-DCP samples stored in plastic bags gave a characteristic odor, indicating the losses were due to volatilization from the frozen samples (89).

It is reported by the Federal Working Group on Pest Management that increased knowledge of sample contact with various kinds of synthetic wraps and containers demonstrates the necessity for glass and perhaps aluminum foil to preserve the integrity of wet samples. Immediate freezing and maintenance of the frozen sample until analysis is the best way to protect samples and prevent degradation and loss of pesticide residues (73). (This also is undoubtedly true for all organic components.) They also state that pesticides can migrate to the walls of a container and be adsorbed; hence, even with a glass container, after the sample is poured out, the walls should be rinsed with the solvent in case the extraction is not made in the container itself (this should also apply to any organics).

There is evidence in the literature that samples to be analyzed for organics or pesticides cannot be dried or freeze-dried without danger of some loss. One study showed 79 percent loss of lindane, 37 percent for dieldrin, 57 percent for p,p'-DDT and 31 percent in o,p'-DDT-DDD on whole eggs and 50 percent for lindane in egg yolk when samples were frozen at -23°C, freeze-dried for 24 hr, and transferred and stored in sealed glass vials at 4°C, so that there was no volatility loss in storage (90).

Morris found that preservation of zooplankton in formalin and methanol resulted in hydrolysis of the animals' lipid and degradation of polyunsaturated fatty acids (90a). He found that the samples were stable up to nine months if stored deep frozen under nitrogen.

Smith reports that changes in nonstructural carbohydrate concentrations occur during the storage of either heat or freeze-dried tissues and concluded that no preservation method is as good as the immediate analysis of fresh tissue; however, he did not investigate straight freezing (91). Other workers found losses in higher fatty acids under either oven or freeze-drying conditions after storage for nine months (92).

Dessicants for tissue preservation are used by some workers who are unable to freeze their samples. The samples are chilled, homogenized, and blended with a combination of sodium sulfate and powdered silica. It is stated that the resulting mixture is a dry, free-flowing powder wherein the pesticide residues are stable for 15 days or more at room temperature (73).

Microbiologicals

Microbiologicals or cellular organisms consist of many different types such as algae, protozoa, fungi (molds or yeasts), bacteria, submicroscopic viruses and other (microscopic nematodes, some insects and some crustaceans), necessitating a wide variety of different sampling and storage conditions. Most preservation has been done through culturing and subculturing. With care, these have been maintained for 5-8 years (93). The sampling implements and containers should obviously be sterile and glass is preferred to plastic, since bacteria tends to grow on plastic surfaces. Since all known life forms require water in the liquid state, this automatically limits the temperature range for microorganisms. Both bacteria and viruses can be freeze-dried to maintain culture collections and to preserve them for use as vaccines. Insects have been supercooled to -30°C without apparent damage; however, they die if ice crystals are formed. Mouse embryos have survived deep freezing to -196°C. Freezing is accompanied by the removal of water, so the cell is subject to damage by both freezing and drying. Mechanical injury is caused by ice crystals and the removal of the water causes an increase in dissolved substances. Biochemically debilitated cells may show a reduction or complete loss of some enzymes, and ice-damaged cells may have leaky membranes or an altered structure. The damage from freezing, drying, and thawing can range from essentially none to 100 percent, depending on the specific organism and conditions. Spores are resistant to both cold and drying. Rapid freezing is reported to be usually better with bacteria, whereas slow freezing is better for animal cell survival. It has been stated that rapid thawing gives better survival than slow thawing (51). Fleischer and Kervina report in studies on long-term preservation of liver for subcellular fractionation that rapid freezing and thawing minimizes the time in which degradation can occur (94). Repeated freezing and thawing is more harmful. Freeze-dried bacteria are better kept at refrigerator temperature than at room temperature (51).

McPeak and Camp (94a) have reported on work of Valeri, et al. (95), Meryman and Hornblower (96), and Gibson, et al. (97). Their studies on storage of red blood cells show that if the samples are stored at a higher temperature than -60°C, they deteriorate within a few weeks. If glycerol is used as a cryoprotective agent and the cells are frozen rapidly in liquid nitrogen and stored at -80°C, the cells are reported to be stable for over 10 years. Fluctuations in storage temperatures of not more than 10°C above or below -80°C are reported to have no adverse effect. Farrant, et al. (98) report that improved recovery of frozen cells can be obtained by interrupting rapid cooling with a timed exposure to a single subzero temperature.

There is a vast amount of additional information in the literature on the subjects of sampling, handling, and storage for microbiologicals, blood, and other biological samples. Since there are so many different types of species and the related optimum handling appropriate to each specie, it is difficult to summarize; however, a number of additional references are given below to indicate the type of problems that are encountered as well as some additional references concerning other subjects discussed above.

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APPENDIX B

Summary of Activities - Container Studies

The integrity of any sample can be no better than that of the container in which it is stored. The need for extremely clean containers for SRM's and other samples is obvious. Unfortunately, few subjects in chemistry are likely to provoke more disagreement than the choice of the proper container materials and the selection of the best method to clean them. Although Teflon remains the container of choice for most materials, its high cost prevents more general usage.

A number of investigations have been undertaken at NBS in an attempt to learn more about container materials. Among the materials investigated were Teflon (FEP, TFE, ETFE, PFA, and TFE Tape), conventional polyethylene (CPE) linear polyethylene (LPE), polycarbonate (PC), polypropylene (PP), polymethylpentane (PMP), polyvinylchloride (PVC), and polystyrene (PS). Four of these materials (CPE, LPE, PC, and FEP) were examined by isotope dilution mass spectrometry. The amount of lead leached from the container in one week of soaking in (1+1) HCl was determined and then the amount of lead leached from the same containers was determined after the bottles were soaked for one week in (1+1) HNO_3. Only the Teflon bottle was heated, however, at the end of this preliminary treatment with HCl and HNO_3, no further leaching was observed (except for PC) after long term leaching with dilute HNO_3 (0.5%).

Nineteen elements were examined using the spark source mass spectrometer. The leaching of the plastics was carried out in the same manner described for lead. Reports summarizing all of the mass spectrometric data are attached. It should be borne in mind that numbers at or below 1 ppb are essentially upper limit values. All concentrations are expressed in terms of ng/g of solution stored in the containers. Neutron activation analysis was employed to look at the impurity levels within the plastics themselves both before and after a cleaning process. Nineteen plastics and twelve elements were examined when possible. Due to the uncertainty in the data, we were unable to correlate the amount of an element leached out of a plastic with the change in the concentration of that element within the plastic.

It should be noted that reactor irradiation changes to some extent the nature of the matrix. All samples absorbed considerable gamma radiation and were visibly browned by ratiation damage. Some materials, especially PVC and the Teflons, were further damaged by the absorption of beta radiation induced in the matrix itself. Furthermore those radioactive atoms that are detected in the leach solution are precisely those which have undergone Szilard-Chalmers recoil and hence may not be representative of the unactivated atoms of interest. The overall result may be summarized as follows. CPE, PFA, TFE, PP, and PS were generally clean. FEP contained large amounts of K and W while Teflon pipe tape contained very large amounts of Zn. Among the other plastics, LPE contained large amounts of Na, Zn, and Ca. PMP contained large amounts of Zn, PC contained large amounts of Br, and PVC contained large amounts of Na and Sn. Usually, the concentration of impurities in a plastic were not significantly changed by the cleaning process. This would seem to indicate that only the surfaces of the plastics are being cleaned.

The plastics were also examined from the point of view of moisture loss. Teflon and polypropylene breathe water vapor at an annual rate of <0.05 percent. Conventional polyethylene loses about 0.1 percent per year, PVC loses about 0.5 percent per year, polymethylpentane loses about 1 percent per year and polycarbonate loses about 2 percent per year. Considering these results, and eliminating all Teflon products by virtue of cost, one is left with only one choice, ... conventional polyethylene. Polymethylpentane and polypropylene have slightly greater contamination levels and the other plastics still more.

Based upon the experience of these studies, the following is the minimum suggested cleaning for conventional polyethylene. Remove surface contamination (wipe using a solvent), rinse, and soak for one week in (1+5) HCl followed by soaking for one week in (1+5) HNO_3. Rinse with best distilled water, fill with distilled water and allow to stand for several weeks to remove acid which has diffused into the container walls. Empty and air dry in a clean room. Containers cleaned in this manner have been used for the preparation of SRM 1643, Trace Elements in Water. To date, no evidence of contamination has been found in preliminary sample work and although long range data is not yet available previous experience with stability studies would indicate that contamination will not be a problem. These results are being prepared for presentation as a paper in *Analytical Chemistry*.

UNITED STATES DEPARTMENT OF COMMERCE
National Bureau of Standards
Washington, D.C. 20234

August 8, 1975

MEMORANDUM FOR T. J. Murphy

From: M. J. Seward and P. J. Paulsen
Analytical Spectrometry Section

Subject: SSMS I.D. Analysis of Impurities Leached from Plastic Containers.

The analysis of the impurities in HCl and HNO_3 after leaching plastic containers is given in the attached tables. Please note that the volume of acid analyzed and amount of spike added are optimum for the analysis at the 3 to 10 ppb level. For this reason all values at or below approximately 1 ppb should be considered as upper limits. These elements were not necessarily actually detected in the samples.

Attachment

cc:
P.D.LaFleur
I.L.Barnes

Impurities Leached from Plastic Containers
ppb by weight

Elements	Teflon FEP (1+1) HNO_3 1A	Teflon FEP (1+1) HCl 1B	Linear Polyethylene (1+1) HNO_3 2A	Linear Polyethylene (1+1) HCl 2B
Pb	1	1	1	0.3
Tl	≤ 0.5	≤ 0.5	≤ 0.5	≤ 0.3
Ba	*2	*1	≤ 0.1	0.7
Te	0.3	1	0.1	---
Sn	0.5	0.7	0.6	≤ 0.5
Cd	0.2	0.3	0.1	0.1
Ag	≤ 4	≤ 3	0.1	---
Sr	0.1	≤ 0.5	0.5	0.1
Se	0.1	0.4	0.2	0.2
Zn	2	2	4	4.7
Cu	1	3	0.2	0.6
Ni	1	0.4	*0.8	0.4
Fe	*10	*8	*1.6	0.7
Cr	0.4	2	0.1	0.4
Ca	40	1	8	30
K	1	0.8	1	0.5
Mg	4	0.5	0.3	0.2
Al	3	2	0.7	2
Na	3	1	5	3

* Positive presence in sample

Note: Samples are spiked for an optimum concentration of 3 to 10 ppb; don't take 1 ppb and lower numbers too seriously (i.e., ≤ values).

Impurities Leached from Plastic Containers
ppb by weight

Elements	Conventional Polyethylene (1+1) HNO_3 3A	Conventional Polyethylene (1+1) HCl 3B	Polycarbamate (1+1) HNO_3 4A	Polycarbamate (1+1) HCl 4B
Pb	0.4	11	0.2	6
Tl	0.8	2	≤ 0.5	0.4
Ba	1	0.2	0.2	2
Te	≤ 0.3	0.4	0.2	---
Sn	≤ 0.5	≤ 0.5	0.1	≤ 8
Cd	0.1	0.2	0.2	≤ 5
Ag	---	---	---	---
Sr	0.1	0.1	≤ 0.1	0.2
Se	2	≤ 0.2	0.3	≤ 3
Zn	1	0.6	0.5	---
Cu	1	0.4	0.5	≤ 4
Ni	0.3	0.2	0.4	0.2
Fe	*2	0.6	*2	≤ 30
Cr	0.5	0.2	0.2	≤ 3
Ca	6	0.5	2	≤ 10
K	1	0.4	1	≤ 3
Mg	0.4	0.4	1	0.5
Al	7	6	3	2
Na	5	26	2	5

June 18, 1975

MEMORANDUM FOR I. L. Barnes, Chief
Analytical Spectrometry Section

From: T. J. Murphy and J. W. Gramlich
Analytical Spectrometry Section

Subject: Cleaning of Plastic Containers

The cleaning of plastic bottles by the alternate use of hydrochloric and nitric acids has been investigated by monitoring the lead leached from the bottles by each acid cleaning. Four plastic container materials were investigated. They were FEP Teflon, linear polyethylene, conventional polyethylene, and polycarbonate. The bottles were filled with the appropriate acid and allowed to stand full for a minimum of one week. The FEP Teflon bottle was heated to about 80 °C and the others were kept at room temperature.

The total lead leached from each bottle was determined by spiking a 200 g aliquot with ^{206}Pb, evaporating and determining the lead by mass spectrometry.

The results of these determinations are shown in Table 1. The results show that the bottles were essentially clean in regards to lead after the first cleaning with (1+1) HCl. The 0.5% HNO_3 was tried since Dr. Patterson of the California Institute of Technology claims that concentration of nitric acid is more efficient for cleaning Teflon Containers than (1+1) HNO_3. However, this was not confirmed in the present study. Even after two months standing, no further leaching of lead occurred.

Attachment

cc: P. D. LaFleur

Table 1 - Lead Leached From Containers

Bottle	Size	(1+1) HCl 1 week	(1+1) HNO_3 1 week	0.5% HNO_3 1 week	0.5% HNO_3 2 months
	ml	ng Pb	ng Pb	ng Pb	ng Pb
Teflon FEP	1000	203	7	—	—
Linear Polyethylene	1000	98	—	—	—
Conventional Polyethylene	500	54	—	—	—
Polycarbonate	500	111	7	7	—

— No significant amount over blank level.

APPENDIX C

Summary of Activities - Speciation in Water, Air and Related Materials

Determining the chemical species or form of an inorganic element in water, air, sediments, etc., is a difficult, if not impossible, task using most analytical techniques. This is true since most methods require some chemical pretreatment of the sample which invariably alters the chemical species.

We have developed a method which can be used in many cases to examine samples "as-is" and looks very promising for the determinaiton of speciation where the various chemical forms have a different volatility. This method, which is called dual plasma emission spectrometry, utilizes a separate controlled temperature heating chamber connected to a capacitively-coupled plasma torch (CCP). The characteristic emission is then analyzed using one or more monochrometers with electron multiplier detectors. A diagram of the dual plasma torch unit is shown in figure 1. In this example the sample (which may be liquid or solid) is shown inside the coils of a small induction furnace which is programmed through a specific, and known, heating cycle. The evolved species are carried by the argon/nitrogen carrier directly into the CCP where emission of the characteristic wavelength takes place. For very refractory samples a high temperature plasma can be formed within the sample chamber. Alternately the induction furnace can be replaced with a simple resistance furnace and/or cooling coils to permit the sample to be taken through any desired heating, cooling cycle.

The unit has been used to date to examine air particulate filters, adsorption tubes with vapor samples and a variety of water, sediments, tissue, yeast and other samples to examine these for various species of lead, mercury, chromium and arsenic contained within the samples.

Two examples of the application of this method are shown here. In figure 2 is shown the change in intensity of the Hg line as a sample of lyophilized tuna fish is heated through the temperature cycle shown. The peak starting at 184 °C has been shown to be due to mercuric chloride and that starting at 353 °C is due to mercuric oxide. A typical working curve for mercuric chloride is shown in figure 3. Similar curves have been obtained for ocean sediments and sea water, both of which show a lower temperature peak determined to be methyl mercury, but this has not as yet been examined quantitatively.

A similar effect has been noted for chromium in yeast (figure 4). In this case the chromium line at 4289 Å has been repetively scanned as the temperature was increased to look for any possible changes in background. The low temperature peak is believed to be an organo-chromium compound although it has not as yet been identified. The higher temperature peak is inorganic chromium. In neither case have the amounts of chromium been determined quantitatively although this should be possible.

The potential of this method to determine chemical speciation in a wide variety of samples and for a number of elements has been demonstrated. Much work remains to be done to further identify organo-metallic species and to determine these quantitatively. This aspect is being explored for chromium in yeast and mercury in fresh fish, sediment and water. Other applications will be explored in the future.

Figure 1

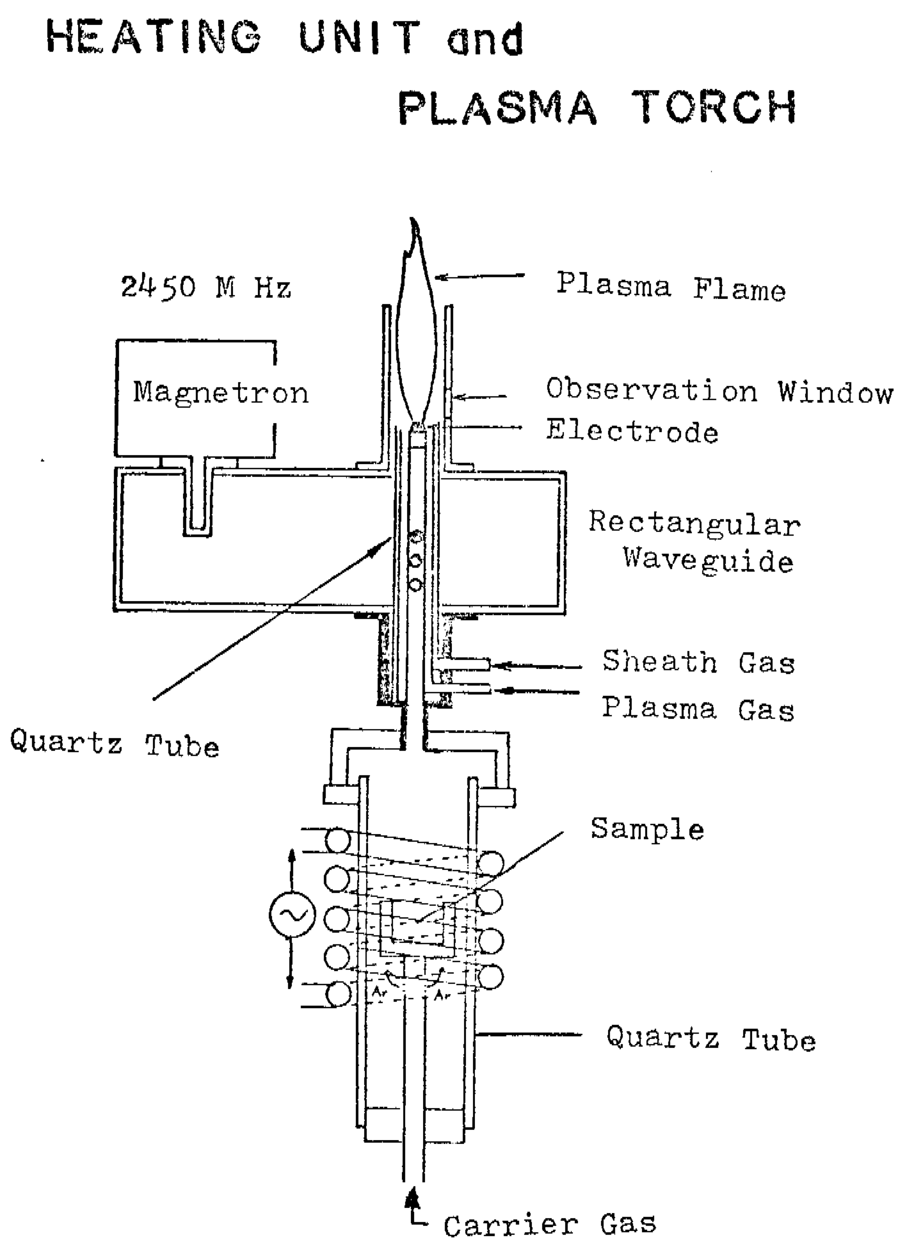

HEATING UNIT and
PLASMA TORCH
2450 M Hz
Plasma Flame
Magnetron
Observation Window
Electrode
Rectangular
Waveguide
Sheath Gas
Plasma Gas
Quartz Tube
Sample
Quartz Tube
Carrier Gas

Figure 2

Hg in Tuna Fish (SRM)

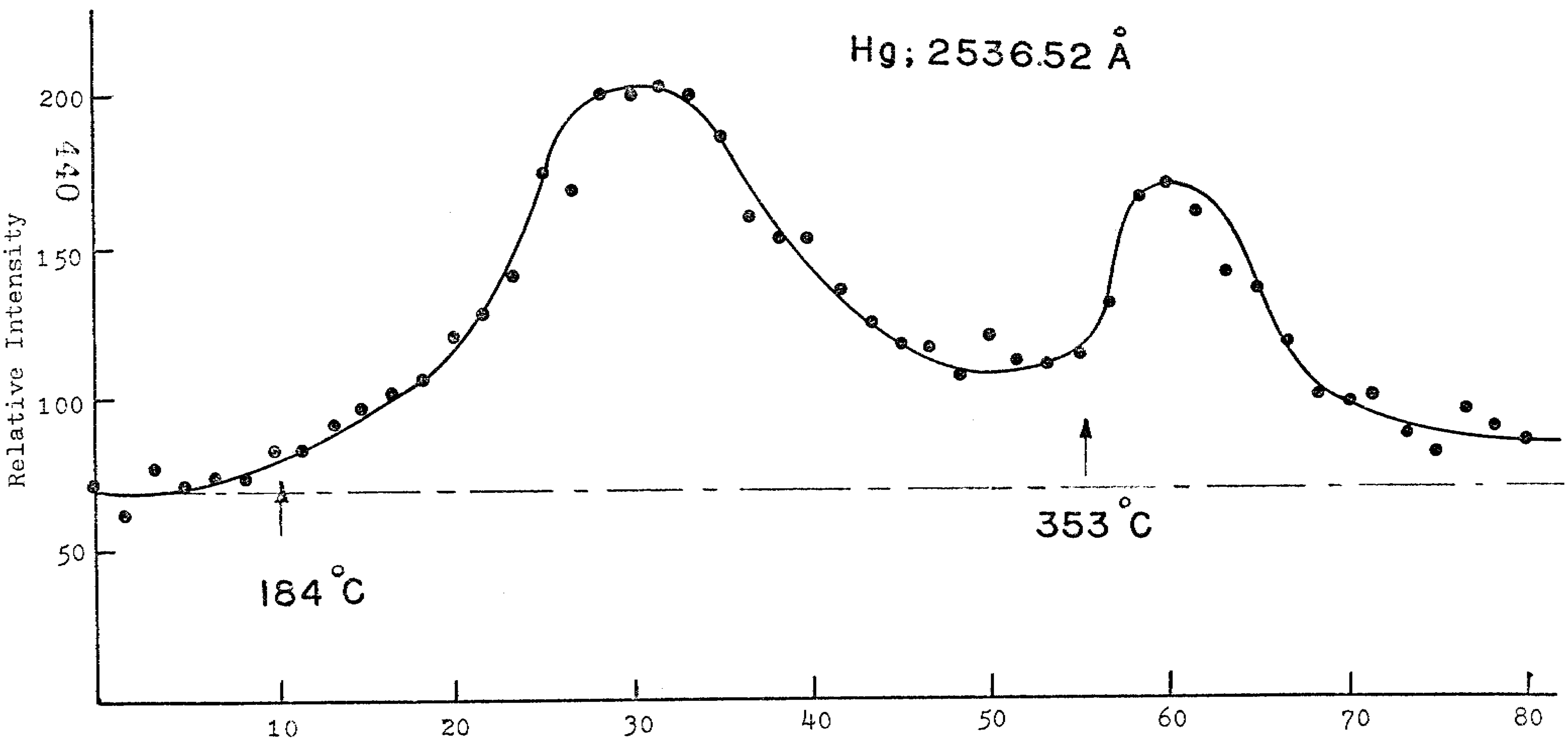
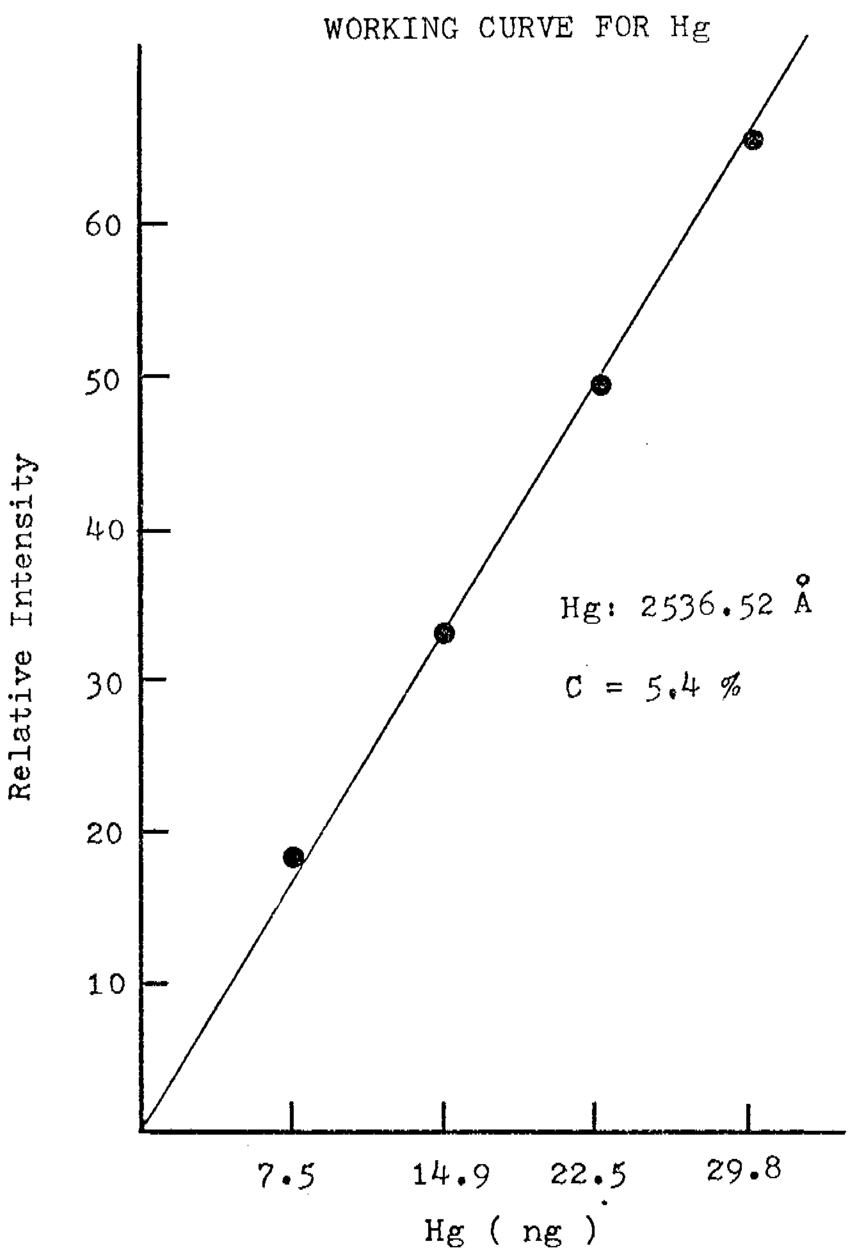


Figure 3


WORKING CURVE FOR Hg
Relative Intensity
60
50
40
30
20
10
Hg: 2536.52 Å
C = 5.4 %
7.5
14.9
22.5
29.8
Hg (ng)

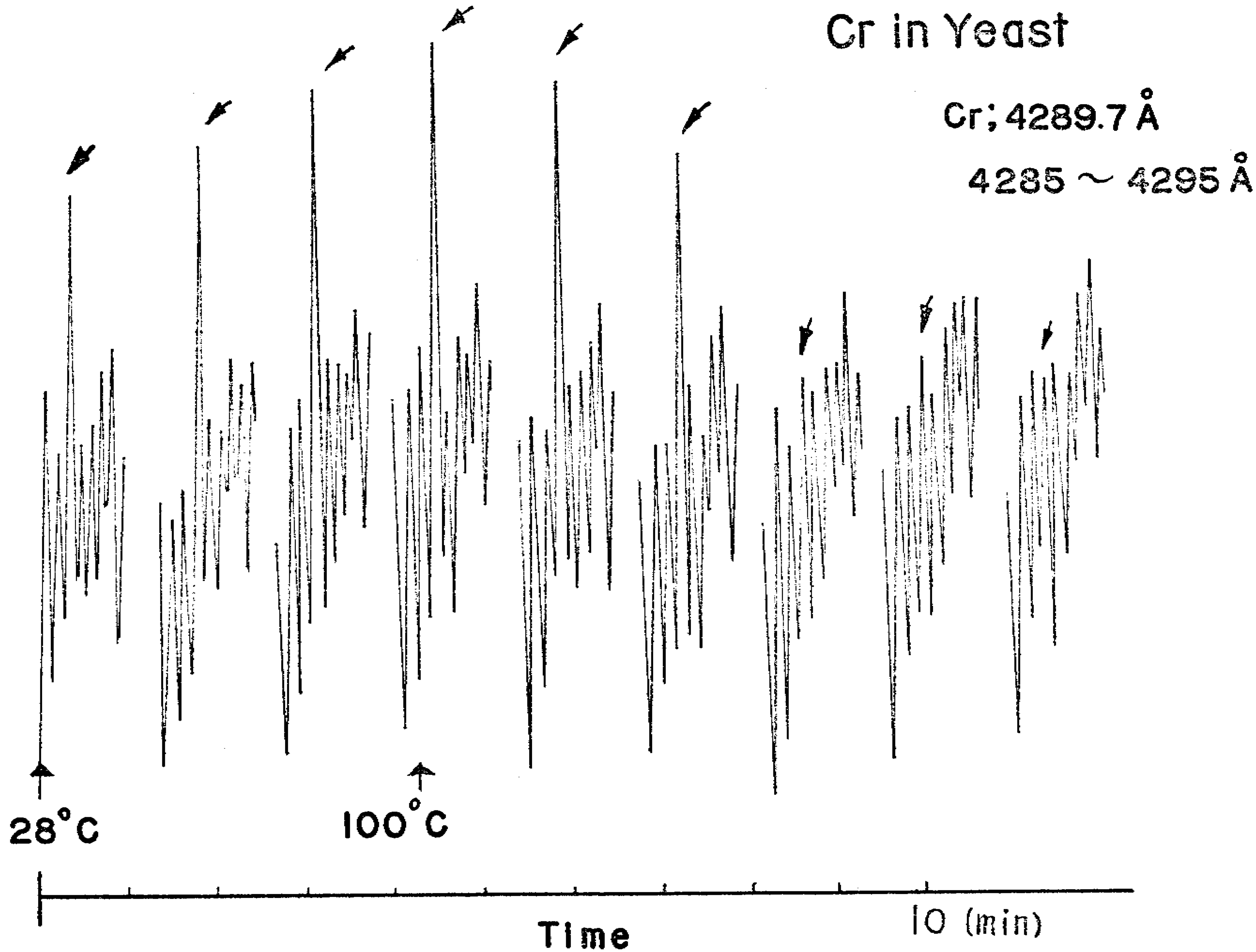


Figure 4

ANNUAL REPORT

Research Unit: #153/155

Reporting Period: 1 July 1975 thru 1 April 1976

Number of Pages: 99

Distribution of Light Hydrocarbons, C_1-C_4, in the Northeast Gulf of Alaska and the Southeastern Bering Shelf

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Dr. Richard Feely

Pacific Marine Environmental Laboratory

Seattle, Washington 98105

March 25, 1976

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1. GENERAL SUMMARY

1.1 Objectives

The low molecular weight hydrocarbon program was initiated in the OCS of Alaska in response to the environmental guidelines set forth in the Environmental Study Plan for the Gulf of Alaska, Southeastern Bering Sea and the Beaufort Seas (January, 1975). Briefly, the purpose was to establish the spatial and temporal variations (seasonal and diurnal) in the dissolved hydrocarbon fraction composed of methane, ethane, ethylene, propane, propylene, isobutane and n-butane. These data are being collected in order to establish baseline levels of naturally-occurring hydrocarbons in the lease areas prior to exploration, development, and production of fossil fuel reserves. These components have proven to be valuable indicators of petroleum input arising from drilling, production, and transportation of crude oil and refined products.

In support of the basic objectives, attention is being given to natural hydrocarbon sources, namely gas and oil seeps, production of hydrocarbons from near-surface sediments, and biogenic sources within the euphotic zone.

1.2 Conclusions

Field studies were conducted in the Northeast Gulf of Alaska and the Southeastern Bering Sea (Bristol Bay) during the Fall of 1975. No seasonal data are yet available.

1.21 Bristol Bay

Dissolved methane is the dominant and most variable hydrocarbon observed in the waters of Bristol Bay. Near-bottom concentrations of methane ranged from 600 nℓ/ℓ near Unimak Pass to 60 nℓ/ℓ in the extreme northern and eastern extremities of Bristol Bay. Surface concentrations were less variable, averaging near atmospheric equilibrium values of 50-70 nℓ/ℓ. Anomalous surface concentrations of methane were observed near Izenbeck Lagoon and Herendeen Bay.

The C_2-C_3 fraction was much less variable, ranging from 0.3 nℓ/ℓ to 1.5 nℓ/ℓ. In general, ethane and ethylene increased with depth toward the bottom as did methane, indicating this region is a probable source. Propane and propylene were generally invariant with depth, averaging 0.5 nℓ/ℓ for the sum. An apparent source of ethane exists near the Izenbeck Lagoon, but the data are inconclusive at this point.

Correlations between the near-bottom concentrations of methane, ethane, and ethylene and organic carbon concentration in surface sediments is apparent.

The concentrations of isobutane and n-butane was uniformly near or below the detection limit of 0.03 nℓ/ℓ. Maximum values near 0.1 nℓ/ℓ were observed in selected samples, but these results may be biased from shipboard contamination.

1.22 Northeast Gulf of Alaska

Not unlike the Bering Sea, methane is the dominant dissolved hydrocarbon at all depths, exceeding the concentration of all other components by a factor of 100 or more. Near-bottom concentrations of methane in the shelf region were uniformly greater than 200 nℓ/ℓ in sharp contrast to the normal conditions observed in the Bering Sea. Extremely high concentrations of methane were observed in the Hinchinbrook Sea Valley just south of the island of the same name. Here, the concentration of methane reached a maximum of nearly 1600 $n\ell/\ell$ within 5 m of the bottom. The apparent plume of methane-rich water arising from this source could be traced toward the east, over Tarr Bank, to a point near the Copper River Delta. It is not certain whether the observed trajectory of methane is due to circulation or a bottom source of methane arising from the fine-grained sediments north of Tarr Bank (Molnia and Carlson, 1975).

Surface concentrations of methane were unusually high over the shelf, rarely falling below 100 $n\ell/\ell$. Surface concentrations exceeding 250 $n\ell/\ell$ were observed near Kayak Island, although the source is not known. Accumulations of methane in surface waters are observed (Lamontagne *et al.*, 1971, 1973a), but the relationship to biological processes is obscure.

Concentrations and spatial variations of ethane, ethylene, propane and propylene were similar to those observed in Bristol Bay. Ethane and ethylene demonstrated a weak correlation with methane, although the methane/ethane ratios observed were much larger in the Gulf of Alaska than in Bristol Bay. It is not known why this is true, however, it appears that increased methane production from shelf sediments in the Gulf of Alaska is not supported by increases in other hydrocarbons.

The concentrations of ethane, ethylene, propane, and propylene were generally less than 1 $n\ell/\ell$. Iso- and n-butane, were near or below the detection limit of 0.03 $n\ell/\ell$.

Without additional corroborating evidence, it would appear that the concentrations of hydrocarbons observed in the OCS study areas arose from the bottom and the immediate surface layers. Methane production from organic-rich sediments is reasonably well understood, but the mechanisms leading to the production of ethane and ethylene from the same sediments is not clear. Increased concentrations of hydrocarbons in the mixed layer, not supported by a bottom source, appears to be biological in origin, although the mechanisms are not understood.

1.3 Implications to Oil and Gas Development

These studies were enacted as a part of the baseline characterization of dissolved natural hydrocarbons on the OCS of Alaska. The hope was to establish concentration levels, temporal and spatial variability of hydrocarbon components common to petroleum or natural gas prior to actual production. These measurements were felt to be an invaluable precursor to future monitoring efforts.

Measurements to date in the Bering Sea and Gulf of Alaska have established ambient concentration levels, and spatial variations, but have not addressed seasonal changes or source areas. The remainder of the field studies, largely to be completed in FY 1976, will address the remaining objectives outlined above, although somewhat incompletely.

A cursory examination of our present findings indicate that the LMWH will be excellent tracers of petroleum input in the Bering Sea because of their naturally low ambient concentrations. Surface methane concentrations in the northeast Gulf of Alaska are higher and more variable than those observed in the Bering Sea, which will reduce its effectiveness as a tracer of petroleum. On the other hand, the concentrations of the C_2-C_4 fractions are extremely low, providing a monitoring team with excellent tag of petroleum or natural gas containing these components. Our studies have also shown that normal production of methane from shelf sediments can be traced for distances greater than 100 km from known sources. Based on these preliminary observations, it is concluded that surface exchange and *in situ* consumption of a low molecular weight hydrocarbons may be sufficiently slow so as to allow them to be used as tracers of the soluble fractions of crude oil. Of course, the value of these components as tracers will depend critically on the magnitude of the input, whether it is at depth or at the surface, and the prevailing hydrographic and meteorological conditions at the point of input. The extent to which microbial metabolism of the volatile hydrocarbon fractions is important is not clear at this time.

The distribution of methane may also serve as a qualitative or semi-quantitative measure of local circulation. If benthic fluxes can be estimated, together with *in situ* consumption rates of methane, subtle near-bottom circulation processes may be characterized that are not resolved readily by routine velocity field observations. A case in point is the near-bottom methane plume observed near Tarr Bank and the Copper River Delta.

2. INTRODUCTION

2.1 General Nature of Study

The development of petroleum resources in the Gulf of Alaska may result in the release of toxic hydrocarbons to the marine environment with possible deleterious effects on the pelagic, benthic, and intertidal biota. increases in the natural levels of petroleum-derived hydrocarbons are likely to occur from the normal activities associated with exploration, production and transportation of crude and refined products within the region. Thus, it is of environmental importance that baseline levels of both naturally occurring and petroleum-derived hydrocarbons be established prior to the development of fossil fuel resources in the area.

Petroleum contains three broad classes of compounds: alkanes, cycloalkanes, and aromatics, but not olefinic hydrocarbons. The proportions of each varies in petroleum, depending on the geologic and geographic sources, but on the average paraffins represent about 30% of the total (Wilson, 1975). The low molecular weight hydrocarbons (LMWH) probably represent no more than 5% of the total, although the exact amount would depend on the natural gas content of the source rock.

It is presently believe that the most toxic fractions of crude oil are the low boiling point aliphatics and aromatics as well as the polynuclear aromatics (Blumer, 1971). Also associated with these complex fractions are the LMWH, in varying amounts. While these compounds are of lower toxicity than the aforementioned fractions (Sackett and Brooks, 1974), they are more soluble and hence are likely to be dispersed by normal mixing processes. Although the evaporation rates of the low molecular weight compounds are quite rapid (McAuliffe, 1966), significant injection of these volatile hydrocarbons into the water column can occur under conditions of turbulence.

Because of their relatively high solubility and low natural abundance, the temporal and spatial distributions of C_1-C_4 hydrocarbons are valuable indicators of petroleum pollution arising from offshore drilling and production platforms, ballast tank discharge, and shipping and transfer operations involving petroleum and petrochemicals (Brooks and Sackett, 1973; Sackett and Brooks, 1974).

The occurrence of light hydrocarbons in the water column may arise from both petroleum production activities and natural marine sources. Gaseous hydrocarbons may exchange across the sea surface in response to a concentration gradient (Broecker and Peng, 1974) diffuse from underlying sediments (Frank *et al.*, 1970), escape in the form of bubbles from natural occurring gas and oil seeps (Link, 1952; Geyer and Sweet, 1973), or be produced by *in situ* biological processes (Lamontagne *et al.*, 1973b).

Methane (CH_4) is a significant component of natural gas and is also produced in anoxic sediments by bacterial CO_2 reduction and fermentation reactions (Claypool, 1974). Thus, the presence of excess methane in the water column overlying organic-rich sediments is not an unequivocal indicator of a petroleum source, unless viewed jointly with the distribution of the heavier fractions, C_2-C_4 (Brooks and Sackett, 1973).

Above saturation values of methane, ethylene and propylene also have been observed in the surface layers of open ocean and are believed to be related to biological activity or photochemical reactions involving organic matter (Swinnerton and Lamontagne, 1974; Lamontagne *et al.*, 1973b).

2.2 Objectives

In conjunction with and in support of the OCSEAP program, the LMWH studies were carried out in the northeast Gulf of Alaska and the southeastern Bering Sea. The objectives of the program are to determine the distributions and natural sources of methane, ethane, ethylene, propane, propylene, isobutane and n-butane prior to drilling activity. Observational activities include areal and seasonal coverage to denote biological processes, benthic sources, as well as short-term time series to elucidate diurnal changes.

As a secondary objective, known offshore seeps were investigated to ascertain the composition of natural gas seeps and to evaluate the merits of naturally-injected LMWH as tracers of petroleum input. The successful implementation of this subprogram depends critically on seep composition and activity, depth of water and unconsolidated sediment cover, mean current fields, and topographic structures (Fischer and Stevenson, 1973).

2.3 Relevance to OCSEAP

The principal concern surrounding the distributions, sources, and sinks of LMWH is not their direct impact on biota, but rather as tracers of more toxic hydrocarbon fractions commonly found in crude oils. Of particular value is the use of LMWH to identify probable trajectories of the toxic dissolved fractions (e.g., PAH) during a spill or a well blowout. Because some of the hydrocarbons common to petroleum are also manufactured by marine organisms, it becomes necessary to evaluate the normal background levels of hydrocarbons before an accurate assessment of anthropogenic input can be made.

Accidental introduction of crude oil onto the surface of the ocean can be readily traced by a variety of visual techniques (e.g., remote sensing). However, the dispersion of soluble hydrocarbon fractions cannot be so easily traced, except with the expenditure of considerable time in sampling and laboratory analysis. In all likelihood, the results would not be available for days, or possibly weeks. The LMWH becomes valuable short-term tracers of dissolved hydrocarbon fractions because of the sensitivity of the method (i.e., parts per trillion), ease of the analysis, and real time data access. Utilizing a pumping system, sample processing, extraction and analysis can be readily accomplished in less than 10 minutes, or nearly in real time. This provides the monitoring team with the capability of ascertaining the time and space scales of the subsurface dispersion plume and to outline probable lateral boundaries for more detailed hydrocarbon sampling.

The success of the method depends on the nature of the accident, hydrographic and meteorological conditions, input concentration of hydrocarbons, and the natural ambient levels against which increases can be measured. Observations conducted in the Gulf of Mexico show that propane and butane are enriched by factors of 10^3 to 10^4 over ambient background levels in areas of known petroleum input (Brooks and Sackett, 1973).

The overall objective is to provide the criteria for an early warning detection of petroleum-derived hydrocarbons and to establish the feasibility of using light hydrocarbons as dispersion tracers, particularly in reference to near-bottom mixing and resuspension processes. In the event of a spill, it is likely that the C_1-C_4 fraction may be useful in guiding a sampling protocol for the relatively soluble toxic fractions of crude oil.

3. CURRENT KNOWLEDGE

Prior to these investigations, no observations had been made on the ambient concentrations of LMWH in the Gulf of Alaska or the Bering Sea (Rosenberg, 1972). In contrast, a few analyses are available from Cook Inlet (Kinney *et al.*, 1970). In this investigation elevated concentrations of methane were observed in the vicinity of the Forelands, north of Kalgin Island, but no definitive conclusions could be drawn as to the probable source. Gas seeps were cited as a possible source, but benthic methane production could not be ruled out. Unfortunately, the analysis of the C_2-C_4 fraction was not reliable, hence confirming data on the possible source of the methane was not available.

Recent studies carried out by us in the northeast Gulf of Alaska and the southeastern Bering Sea have determined characteristic LMWH distributions for the late fall season. Local hydrocarbon sources have been identified and some measure of the diurnal variability documented. Both vertical and horizontal distributions are available from our observations. Details of our findings to date will be presented in sections 6 and 7 of this report.

4. STUDY AREAS

4.1 Bering Sea

Observations for LMWH were conducted according to the station grid shown in Figure 4-1. The PMEL survey grid was developed primarily for the suspended particulate matter program, but because of its uniform coverage it was adopted as a preliminary operation grid for hydrocarbons as well. The PMEL grid was supplemented by observations from the Institute of Marine Science (IMS) cruise track, which increased the areal coverage toward the west. A total of 80 stations were occupied, 69 of which (51 PMEL and 18 EBBS stations) were sampled in vertical profile. Because of the shallow depths encountered in Bristol Bay, 3-4 nominal depths were selected at each station. The remaining 18 PMEL stations were involked to investigate the surface transport of LMWH from Izenbeck Lagoon. Only surface sample were acquired at these stations.

4.2 Northeast Gulf of Alaska

Observations for LMWH were conducted at the stations shown in Figure 4-2. The grid shown in Figure 4-2 was developed primarily to investigate the distributions of suspended particulate matter, but because of its uniform coverage it was adopted as a preliminary operational sampling grid for hydrocarbons as well. A total of 47 stations were occupied in vertical profile, usually 5-6 discrete depths being sampled at each station. Surface and near bottom samples (bottom -5 m) were taken uniformly at each station.

Figure 4-1 Station locations in the southeastern Bering Sea. The PMEL grid is denoted by 0; the IMS grid by ⬡. Surface stations near Izenbeck Lagoon are shown in lower case letters (i.e., a,b,c, etc.)

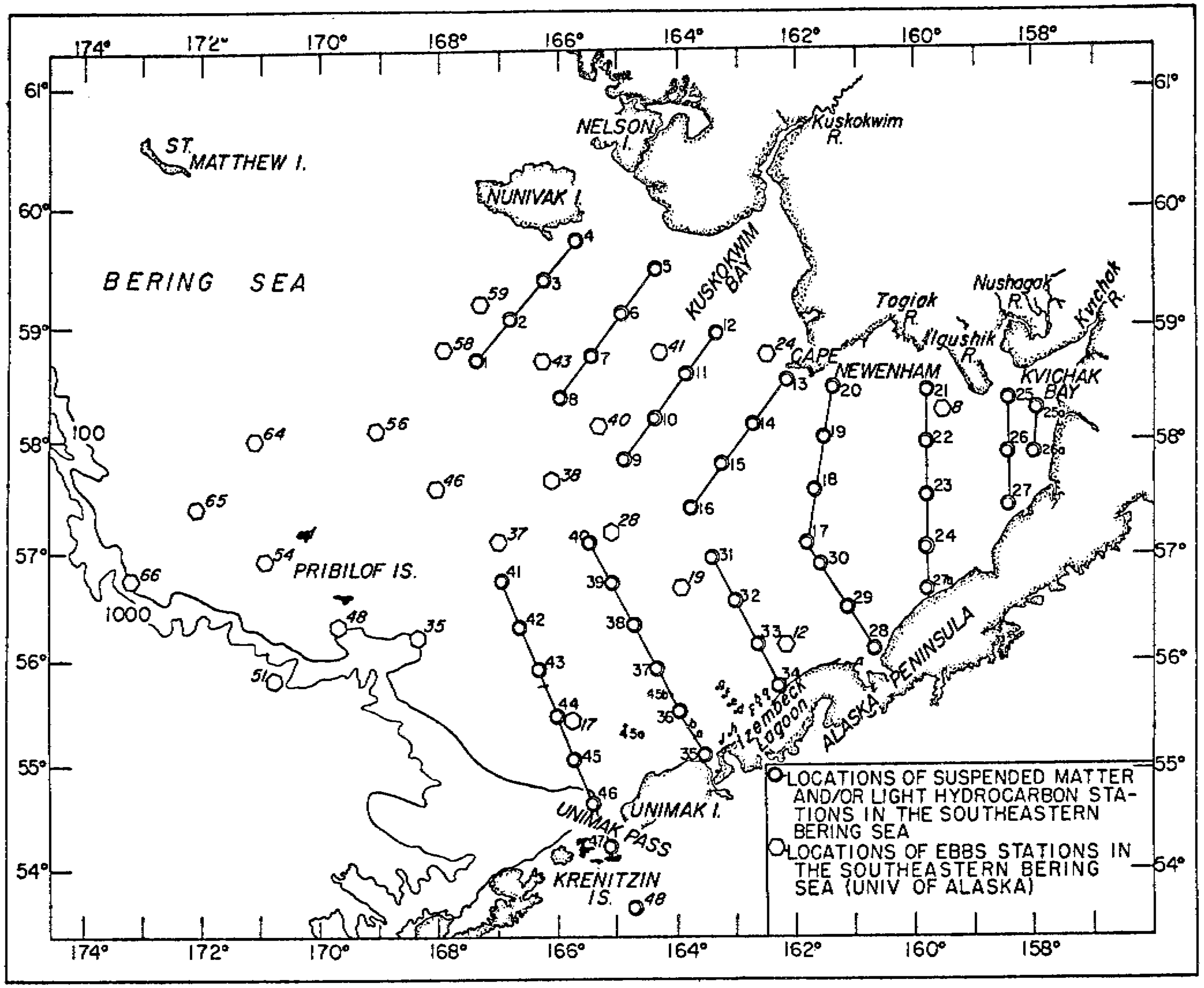
ST. MATTHEW I.
BERING SEA
NUNIVAK I.
NELSON I.
Kuskokwim R.
KUSKOKWIM BAY
CAPE NEWENHAM
Togiak R.
Igushik R.
Nushagak R.
Kvichak R.
KVICHAK BAY
PRIBILOF IS.
Izembeck Lagoon
ALASKA PENINSULA
UNIMAK I.
UNIMAK PASS
KRENITZIN IS.
100
1000
LOCATIONS OF SUSPENDED MATTER AND/OR LIGHT HYDROCARBON STATIONS IN THE SOUTHEASTERN BERING SEA
LOCATIONS OF EBBS STATIONS IN THE SOUTHEASTERN BERING SEA (UNIV OF ALASKA)

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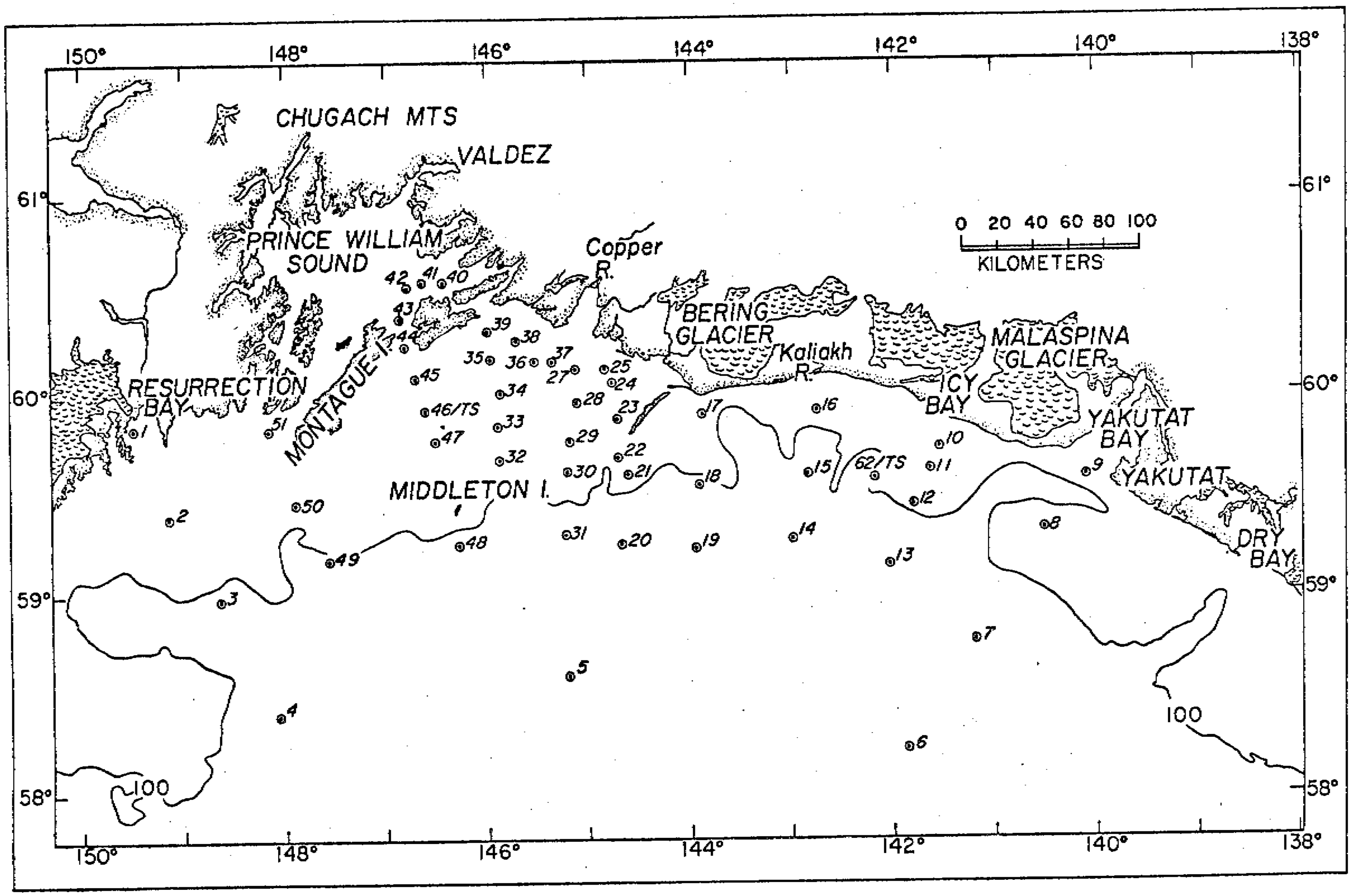
Figure 4-2 Station locations in the northeastern Gulf of Alaska. Investigations of gas-charged sediments near Kayak Island were conducted near station 22.



CHUGACH MTS
VALDEZ
PRINCE WILLIAM SOUND
Copper R.
BERING GLACIER
Kaliakh R.
MALASPINA GLACIER
ICY BAY
YAKUTAT BAY
YAKUTAT
DRY BAY
RESURRECTION BAY
MONTAGUE I.
MIDDLETON I.
0 20 40 60 80 100
KILOMETERS
150° 148° 146° 144° 142° 140° 138°
61° 60° 59° 58°
100

An attempt was made to identify gas seeps or gas-charged sediments along the southeast site of Kayak Island. However, the probable locations were in shallow, uncharted depths and it was not possible to sample the proposed sites without endangering the vessel (DISCOVERER).

5. METHODOLOGY

5.1 Sample Concentration

LMWH are stripped from 1 ℓ volume of seawater using the procedure recommended by Swinnerton and Linnenbom (1967). A diagram of the gas phase equilibrator is shown in Figure 5-1. Although the system actually used in these studies is somewhat simpler in detail than that shown in Figure 5-1, the principle remains the same.

Hydrocarbons are removed in a stream of ultra-pure He (120 ml/min) and condensed on an activated alumina trap maintained at -196°C. Approximately 12 minutes of stripping are required to quantitatively remove the hydrocarbons (>98%) from solution, after which time the trap is warmed to 90-100°C and the absorbed gases are allowed to pass into the gas chromatograph (GS).

5.2 Gas Chromatography

The hydrocarbons are chromatographed on a column (3/16" x 8') of Poropak(R) Q, 60-80 mesh, and detected sequentially with a flame ionization detector (FID) as they emerged from the column. The GC is a Hewlett packard model (R)5711, equipped with dual FID's. Analysis was carried out isothermally at 30°C with a GC He flow rate of 60 ml/min. Total chromatographic analysis time through the C_4's was approximately 15 minutes. A typical chromatogram of aliphatic components is shown in Figure 5-2A.

In order to be prepared for the 1975 field season, sufficient time was not available to adequately develop optimal GC analytical parameters

Figure 5-1 Low molecular weight hydrocarbon extraction system (Swinnerton and Linnenbom, 1967; Swinnerton *et al.*, 1968). The extraction system shown is a recent modification given to us by Mr. R. Lamontagne of the Naval Research Laboratories, Wash. D.C.

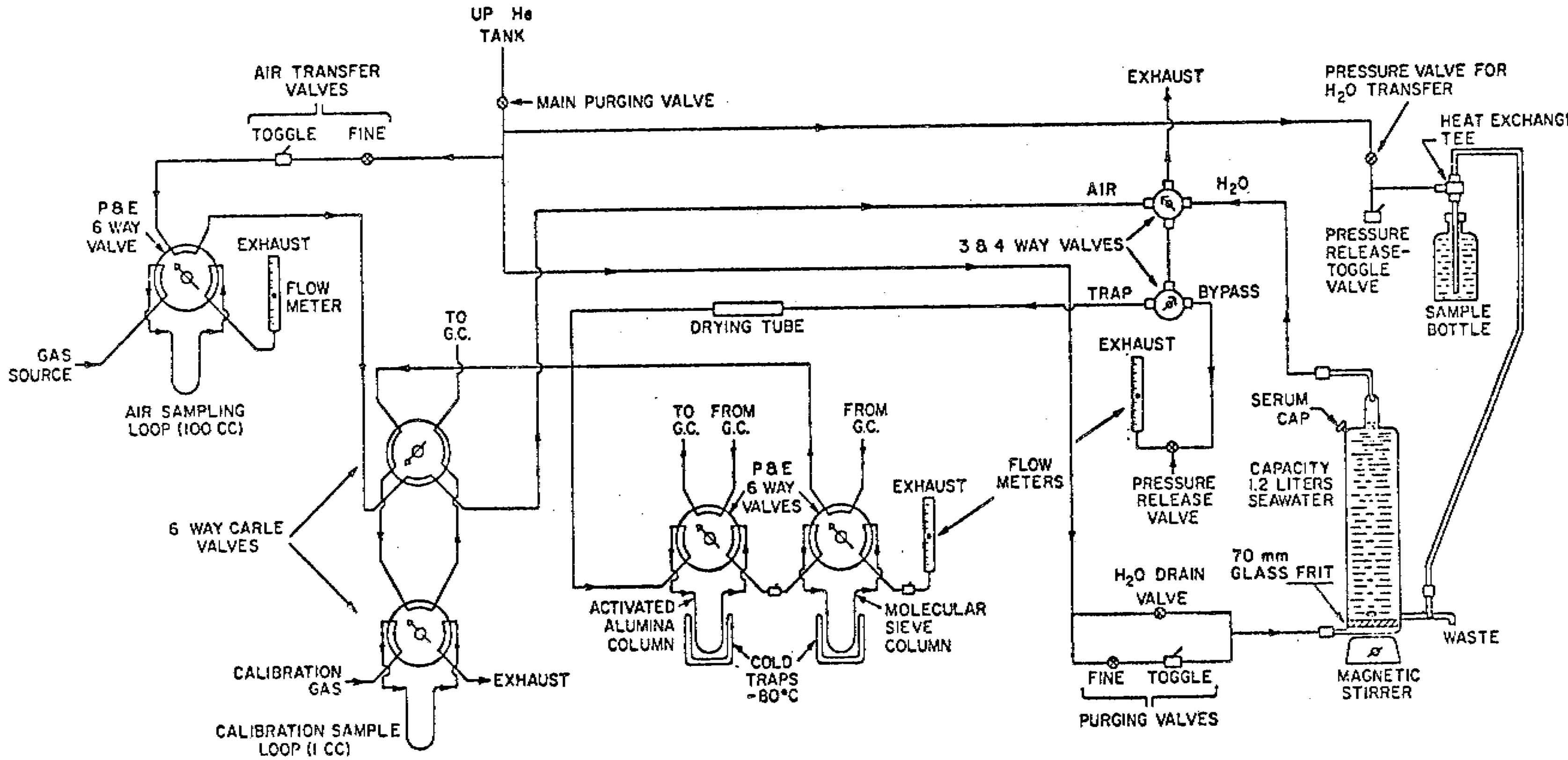
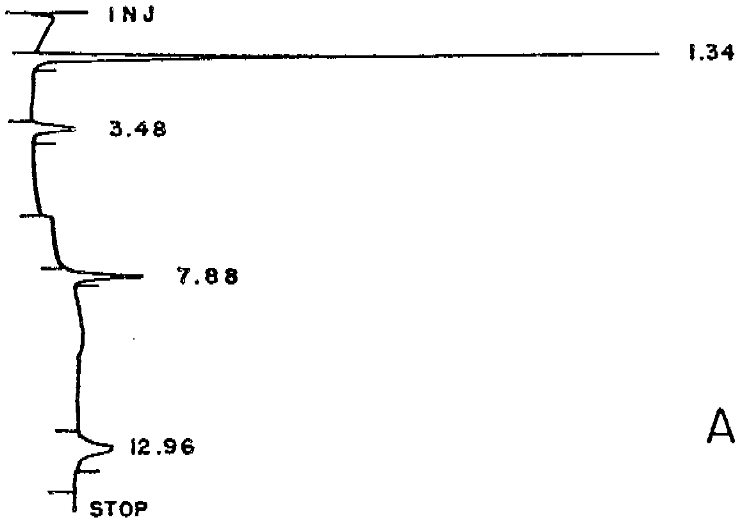
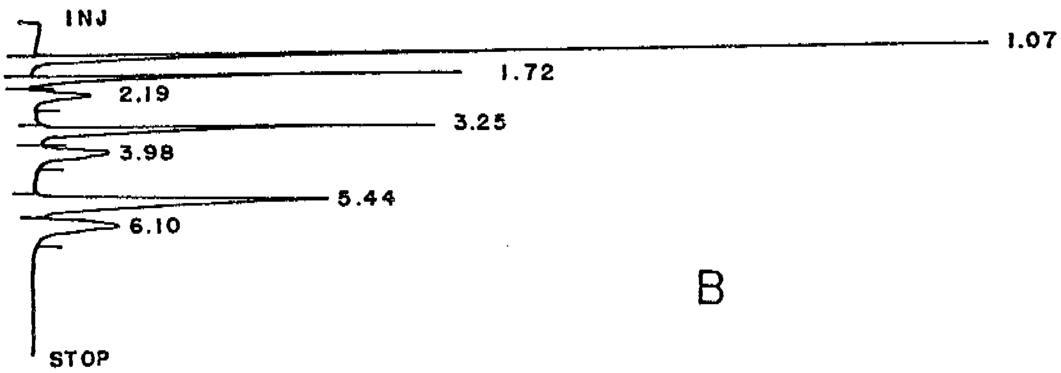

UP He
TANK
MAIN PURGING VALVE
AIR TRANSFER
VALVES
TOGGLE
FINE
P&E
6 WAY
VALVE
EXHAUST
FLOW
METER
GAS
SOURCE
AIR SAMPLING
LOOP (100 CC)
TO
G.C.
6 WAY CARLE
VALVES
CALIBRATION
GAS
EXHAUST
CALIBRATION SAMPLE
LOOP (1 CC)
DRYING TUBE
TO
G.C.
FROM
G.C.
FROM
G.C.
P&E
6 WAY
VALVES
EXHAUST
ACTIVATED
ALUMINA
COLUMN
COLD
TRAPS
-80°C
MOLECULAR
SIEVE
COLUMN
FLOW
METERS
EXHAUST
AIR
H2O
3 & 4 WAY VALVES
TRAP
BYPASS
EXHAUST
PRESSURE
RELEASE
VALVE
H2O DRAIN
VALVE
FINE
TOGGLE
PURGING VALVES
PRESSURE VALVE FOR
H2O TRANSFER
HEAT EXCHANGE
TEE
PRESSURE
RELEASE-
TOGGLE
VALVE
SAMPLE
BOTTLE
SERUM
CAP
CAPACITY
1.2 LITERS
SEAWATER
70 mm
GLASS FRIT
WASTE
MAGNETIC
STIRRER

Figure 5-2A Chromatographic response for the C_1-C_4 aliphatic hydrocarbons. Retention times are given in minutes. The sample was a Matheson certified standard containing methane (21.8 ppmv), ethane (1.3 ppmv), propane (1.25 ppmv), and n-butane (1.1 ppmv). Separation of the hydrocarbons was effected isothermally at 30°C on Poropak^R Q (3/16" x 8') with a helium carrier flow of 60 ml/min. Integration was performed by a Hewlett Packard^R model 3380 reporting integrator.

Figure 5-2B Chromatographic response of the C_1-C_4 aliphatic and olefinic hydrocarbons. Retention time in minutes is shown above the individual components. The sample was a Matheson certified standard containing methane (102.7 ppmv), ethane (5.0 ppmv), ethylene (1.9 ppmv), propane (5.0 ppmv), propylene (2.0 ppmv), iso-butane (5.1 ppmv) and n-butane (2.0 ppmv). Separation of the hydrocarbons was carried out on a Poropak^R Q column (3/16" x 8') in series with an activated alumina column (3/16" x 2") impregnated with silver nitrate (1% by weight). Temperature programming betwen 100° - 150°C was used to accelerate the analysis. Integration was performed on a Hewlett-Packard^R model 3380 reporting integrator.



A



B

(i.e., flow rates, solid supports, temperature programming, etc.). However, during the last 3 months, considerable effort has been given to the rapid chromatographic analysis of LMWH. The original Poropak(R) Q column has been supplemented with an activated alumina column (3/16" x 2") impregnated with 1% silver nitrate by weight. This modification, coupled with temperature programming from 110-150°C, has resulted in sharper peaks, better separation and reduced retention times for all components (Figure 5-2B). Although the total analysis time is now regulated by stripping time (i.e., 12 minutes), we are currently developing a vacuum extractor to reduce the stripping time to less than 3 minutes.

5.3 Quality Control

5.31 Standardization and Accuracy

The LMWH analysis was referenced to specially prepared hydrocarbon mixtures supplied and certified by Matheson Gas Products. The concentrations of the individual components were adjusted to meet the naturally-occurring hydrocarbon levels expected in the OCS study areas, although concentrations less than 1 ppm could not be reliably prepared. To confirm the analysis, one of the standards was sent to NBS for LMWH analysis, the results of which are given in Table 5-1. The NBS analyzed standard will be used to calibrate the remaining hydrocarbon standards.

TABLE 5-1. Analysis of Matheson certified hydrocarbon standard by National Bureau of Standards

Component	Matheson	NBS
	Nominal Concentration ppmv	
methane	23 ± 1	21.8 ± 0.8
ethane	1 ± 0.1	1.3 ± 0.1
propane	2 ± 0.2	1.25± 0.02
n-butane	1 ± 0.1	1.1 ± 0.02

5.32 Precision

Precision of analysis was accomplished in two ways. First, precision errors associated with standard injection and GC response were determined by replicate injection of standard gases. Injection of gas standard was accomplished with the aid of a Carle(R) sampling valve fitted with a calibrated 1 cm sample loop. The results of this experiment are depicted in Table 5-2, together with estimates of the relative error. It is readily seen that individual component precisions are better than 2.2%. Relative error increases as carbon number increases.

The overall error in precision, which includes water sampling, sample stripping, and GC response characteristics, was estimated from replicate analysis of near surface sea water. Water samples were taken in a 10 ℓ Niskin(R) sampler and subdivided for replicate analyses. This experiment was repeated 7 times, 4 in the Bering Sea and the remainder in the northeast Gulf of Alaska. The results of this study are shown in Table 5-3 in terms of mean concentrations ($\overline{X}$), standard deviation (S), and the relative error in percent. A blank column indicates that hydrocarbon concentrations were too low to produce an integrated response. Ignoring spurious values, it may be noted that the relative errors, except for n-butane, were generally less than 10%. Precise measurement of low concentrations of n-butane presented a problem, primarily because of inherent difficulties in obtaining quantitative stripping of the C_4 fraction.

The detection limit for each component was estimated from the nominal background noise. Interpreted peak areas less than 200 counts were considered insignificant, placing a defined lower limit on the detectability. The values are, based on the data shown in Table 5-2, methane - 0.12 nl/l, ethane - 0.06 nl/l, ethylene - 0.07 nl/l, propane - 0.04 ml/l, propylene - 0.04 nl/l, isobutane -0.03 nl/l, and n-butane - 0.03 nl/l.

TABLE 5-2. Analytical precision of the LMWH analysis determined from replicate injection of standards

Component	Conc. ppmv	A Unit	σ A Areas	% Error	N No. Samples
Methane	102.7	173793	1160	0.7	8
Ethane	5.0	15804	102	0.6	"
Ethylene	1.9	5254	77	1.5	"
Propane	5.0	25085	229	0.9	"
Propylene	2.0	9980	186	1.8	"
Isobutane	5.1	30584	454	1.5	"
n-Butane	2.0	11970	270	2.2	"

5.4 Data Collection Rationale

The original scope of the baseline study was to determine horizontal, vertical, and seasonal variations of LMWH in the study areas as a precursor to petroleum development. Stress was placed on the distribution of propane and butanes as their presence in elevated amounts is much stronger evidence for petroleum hydrocarbon input. The investigation of seeps was only

TABLE 5-3. Replicate analyses at 7 stations in the Bering Sea and northeast Gulf of Alaska. The mean (X) and standard deviation (S_x) are based on 3 replicate analyses at each station. Relative error (R.E.) is the quotient of the standard deviation and the mean, given in percent. All concentrations are given in nℓ/ℓ (NPT).

Stations	Methane			Ethane			Ethylene			Propane			Propylene			n-Butane		
	$\overline{X}$	S_x	R.E.	$\overline{X}$	S_x	R.E.	$\overline{X}$	S_x	R.E.	$\overline{X}$	S_x	R.E.	$\overline{X}$	S_x	R.E.	$\overline{X}$	S_x	R.E.
Bering Sea																		
EBB 59	63.9	3.6	5.6	0.63	0.06	9.5	0.66	0.02	3.0	-	-	-	-	-	-	0.24	0.11	45.8
PML 5	55.0	2.4	4.3	0.37	0.01	2.7	0.43	0.02	4.6	-	-	-	-	-	-	0.14	0.04	28.5
EBB 43	60.6	1.6	2.6	0.43	0.02	4.6	0.77	0.02	2.6	0.28	0.04	14.3	0.54	0.02	3.7	0.17	0.07	41.2
EBB 41	66.3	3.7	5.6	0.41	0.10	24.3	0.33	0.13	39.4	-	-	-	0.40	0.16	40.0	-	-	-
NEGOA																		
PML 1	173.1	0.86	0.5	0.53	0.10	18.8	1.0	0.10	10.0	0.17	0.01	5.9	-	-	-	-	-	-
PML 40	591.6	20.6	3.5	0.44	0.02	4 5	0.91	0.01	1.1	0.18	0.01	5.5	0.25	0.04	16.0	-	-	-
PML 9	123.6	1.0	0.8	0.16	18.7	18.7	0.64	0.02	3.1	0.11	0.01	9.1	0.18	0.01	5.5	-	-	-

tangentially approached as our sampling grid was not "tight" enough to unequivocally locate seeps. We did, however, attempt to locate seeps along the 10-fathom fault line southeast of Kayak Island with a dedicated 12 hour study (Carlson *et al.*, 1975).

In addition to the baseline survey, two 36-hour time series stations were occupied in each area. The purpose of these investigations was to ascertain the short term temporal changes in hydrocarbons, and thereby establish normal ambient variability against which future observations might be compared.

Ethylene and propylene, while not characteristic components of natural gas, were determined routinely in conjunction with the normal aliphatic components. Chromatographic separation of the olefins from the parent aliphatics results in a more accurate assessment of the concentrations of the latter, since the unsaturates are usually found in greater amounts.

In addition to the investigations carried out on the distribution of LMWH, considerable effort was mounted to elucidate natural hydrocarbon sources. To accomplish this, surface and near bottom samples were taken. In the Gulf of Alaska, sampling of the surface layers was carried out in conjunction with the productivity observations to ascertain possible hydrocarbon input due to photosynthetic or related biological processes. Near bottom samples were taken to characterize hydrocarbon sources in sediments. The origin of natural hydrocarbons must be understood before effective monitoring measures can be effectively mounted.

6. RESULTS

6.1 Bering Sea (Bristol Bay)

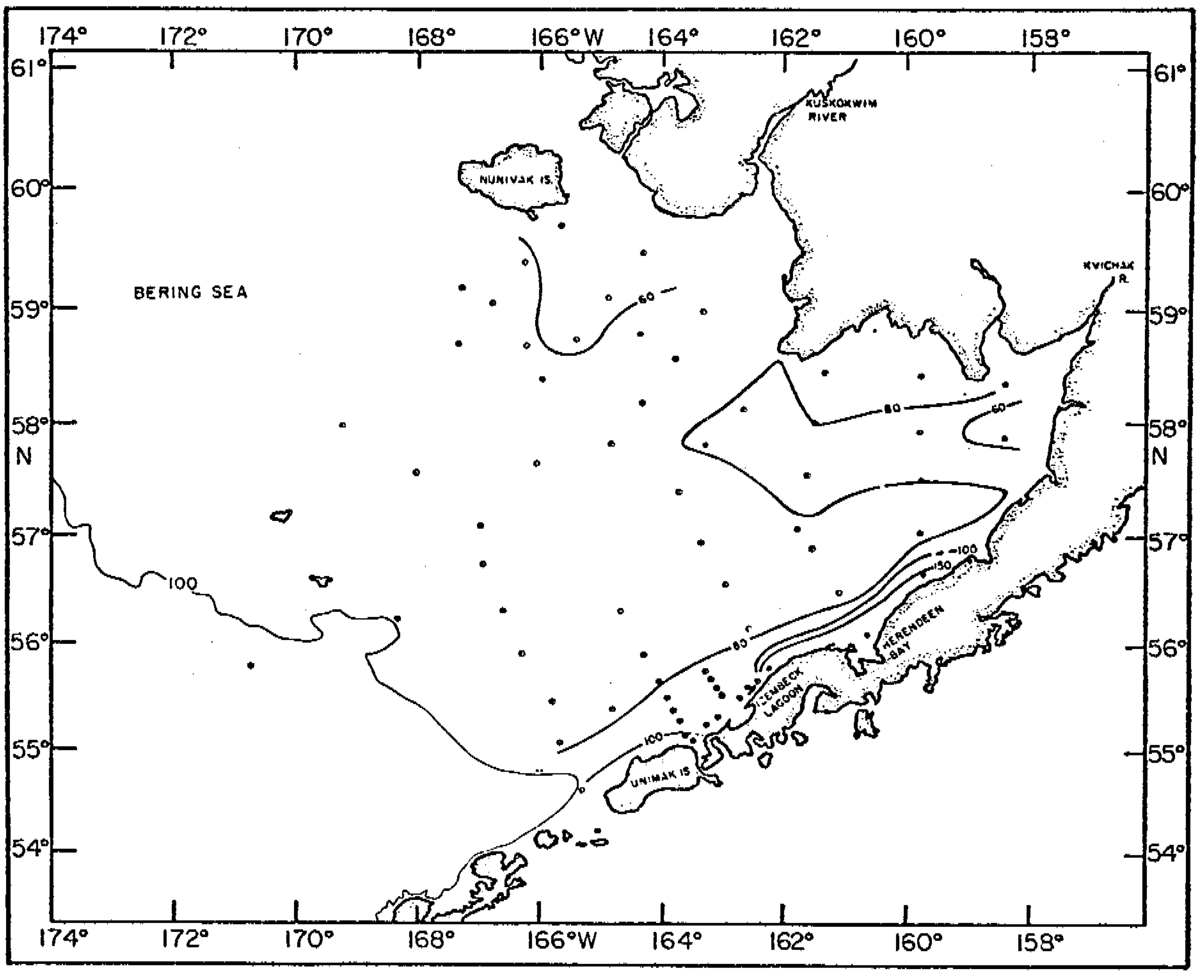
A total of 72 stations were occupied in Bristol Bay, comprising PMEL and IMS grids (see Figure 4-1). Usually 3 to 5 standard depths were sampled at each station, depending on the depth of water, hydrographic conditions, and sampling logistics. Analytical difficulties were encountered during segments of the cruise, resulting in an incomplete data record. Considerable difficulty was encountered with ship-induced petroleum contamination of the water samplers.

The results of our findings will be described in terms of areal distributions of significant hydrocarbon, their relationship to known source regions, and short term variability in concentrations brought about by tidal influences and/or meteorological events. Complete analysis of the hydrocarbon data in terms of hydrographic parameters has not been accomplished to date, but will be discussed in the final report (October 1976).

6.11 Areal Distributions of Methane

Surface methane concentrations in $n\ell/\ell$ are shown in Figure 6-1. A strong surface source of methane is indicated in the region of Izenbeck Lagoon and Herendeen Bay with normal equilibrium concentrations found elsewhere. Solubility calculations for methane have not been completed as yet, but surface sea water in equilibrium with the atmosphere should contain between 50-70 $n\ell/\ell$ NPT of methane (Lamontagne *et al.*, 1973b). Values less than 60 $n\ell/\ell$ were observed in the delta regions of the Kuskokwim and Kvichak

Figure 6-1 Surface distribution of methane in Bristol Bay during Sept-Oct. 1975. Concentrations are given in $n\ell/\ell$ (NPT).



174°
172°
170°
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166°W
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162°
160°
158°
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60°
59°
58°
N
57°
56°
55°
54°
BERING SEA
NUNIVAK IS.
KUSKOKWIM RIVER
KVICHAK R.
IZEMBEK LAGOON
HERENDEEN BAY
UNIMAK IS
60
80
100
150

rivers, which presumably represent fresh water influence or the absence of a bottom methane source.

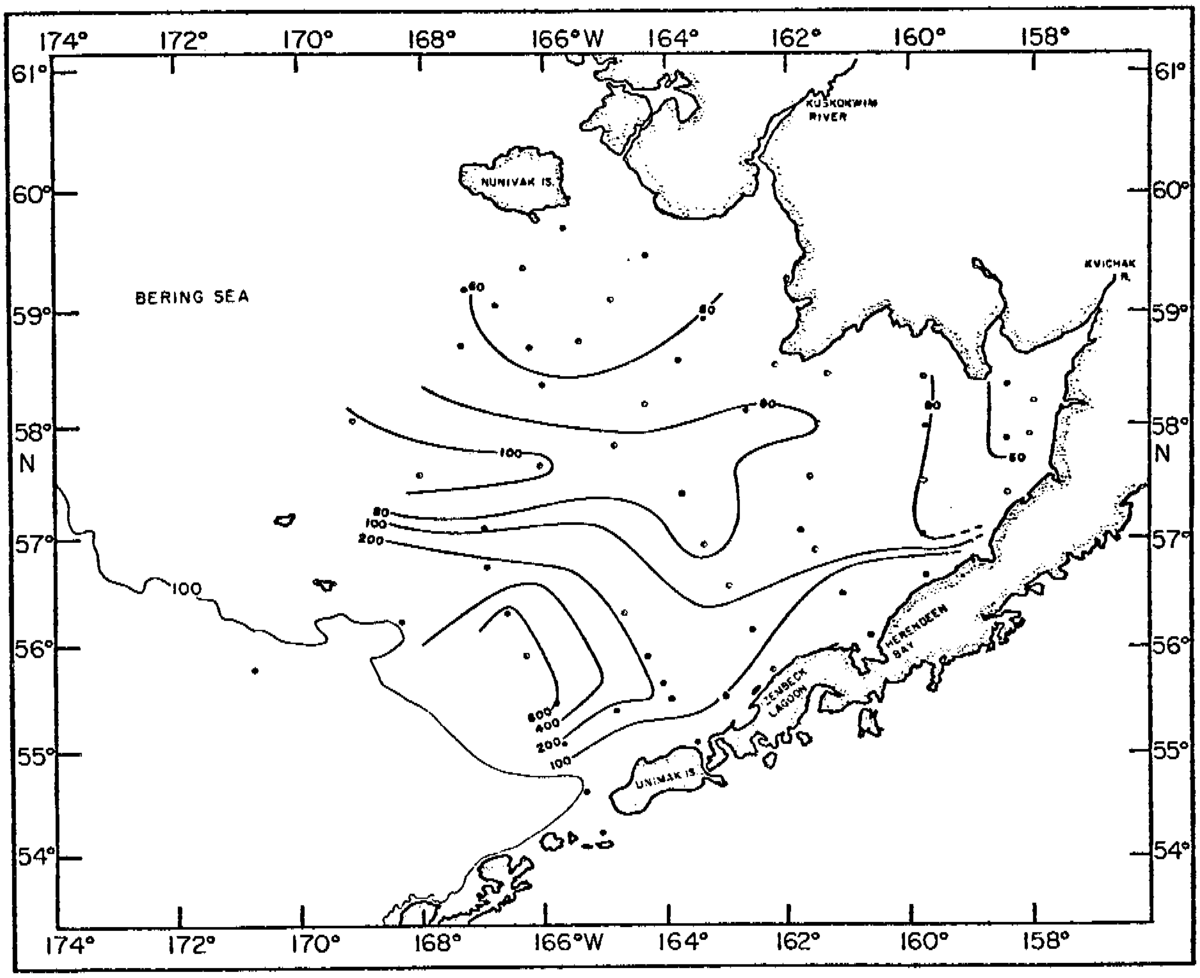
The distribution of methane in the near-bottom waters demonstrates the marked influence of benthic sources (Figure 6-2). Methane concentrations exceeding 700 nℓ/ℓ were found north of Unimak Pass and presumably indicate localized organic-rich sediments. This observation is borne out by the surface sediment distribution of organic carbon (Sharma, 1974), which are significantly higher in this region as compared to eastern Bristol Bay. In contrast, regimes characterized by river discharge plumes reveal low methane concentrations indicative of coarse grained sediments low in organic carbon (Sharma, 1974).

The zonal plume of relatively high methane concentrations lying along 58°N latitude may be due in part to the intrusion of cold water from the north. Near bottom temperatures for stations EBBS 38, 46, and 56 were in the range 0-1°C, whereas higher temperatures in the range 3-6°C were observed both to the north and to the south. The origin of this water is not precisely known, but is thought to arise in the Gulf of Anadyr (Takenouti and Ohtani, 1974). The methane also may be of local origin, but sediment size frequency and organic carbon concentrations in surface sediments would suggest an advective source (Sharma, 1974). More detailed measurements are needed to clarify the issue, however.

6.12 Areal Distributions of Ethane and Ethylene

Surface concentrations of ethane are shown in Figure 6-3. The ethane distribution shows little horizontal variations; concentrations range from lows of 0.3 nℓ/ℓ to highs near 0.6 nℓ/ℓ. The average for all surface values was 0.5 nℓ/ℓ. A lobe of relatively high ethane concentration appears to

Figure 6-2 Areal distribution of methane 5 m from the bottom in Bristol Bay during Sept-Oct. 1975. Concentrations are given in nℓ/ℓ (NPT).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166°W
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160°
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60°
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58°
N
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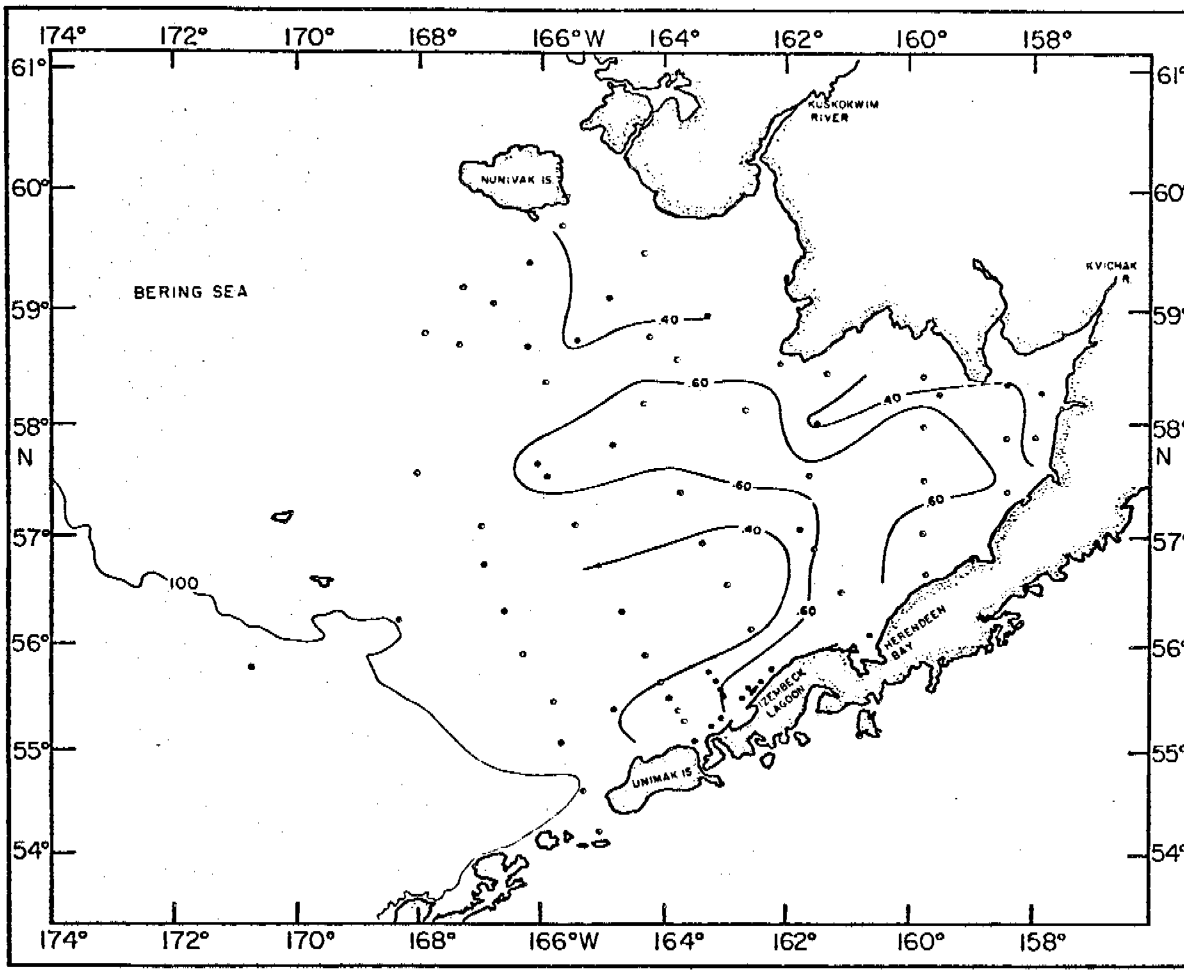
56°
55°
54°
NUNIVAK IS.
KUSKOKWIM RIVER
BERING SEA
KVICHAK R.
HERENDEEN BAY
IZEMBECK LAGOON
UNIMAK IS.
100
80
200
400
600

Figure 6-3 Surface distribution of ethane in Bristol Bay during Sept-Oct. 1975. Concentrations are given in $n\ell/\ell$ (NPT).


BERING SEA
NUNIVAK IS.
KUSKOKWIM RIVER
KVICHAK R.
IZEMBECK LAGOON
HERENDEEN BAY
UNIMAK IS.
100
.40
.60
174°
172°
170°
168°
166°W
164°
162°
160°
158°
61°
60°
59°
58°
N
57°
56°
55°
54°

emerge from the lagoon areas and move counterclockwise around the eastern Bering Sea. Because of low ambient concentrations of ethane and relatively high analytical uncertainty, it is difficult to predict at this time whether the observations are reliable. It is of interest, however, that the highest ethane values observed at the surface, occurred near Herendeen Bay.

Near bottom concentrations of ethane shown in Figure 6-4 revealed a pattern similar to that observed for methane, although the localized maxima and minima are highly attenuated. Vertical profiles near Izenbeck Lagoon and Herendeen Bay indicate that the sediments are probably not the source of the high ethane concentrations shown in Figure 6-3. The low contour frequency in Figure 6-3 simply reflects the rather uniform horizontal distribution of ethane.

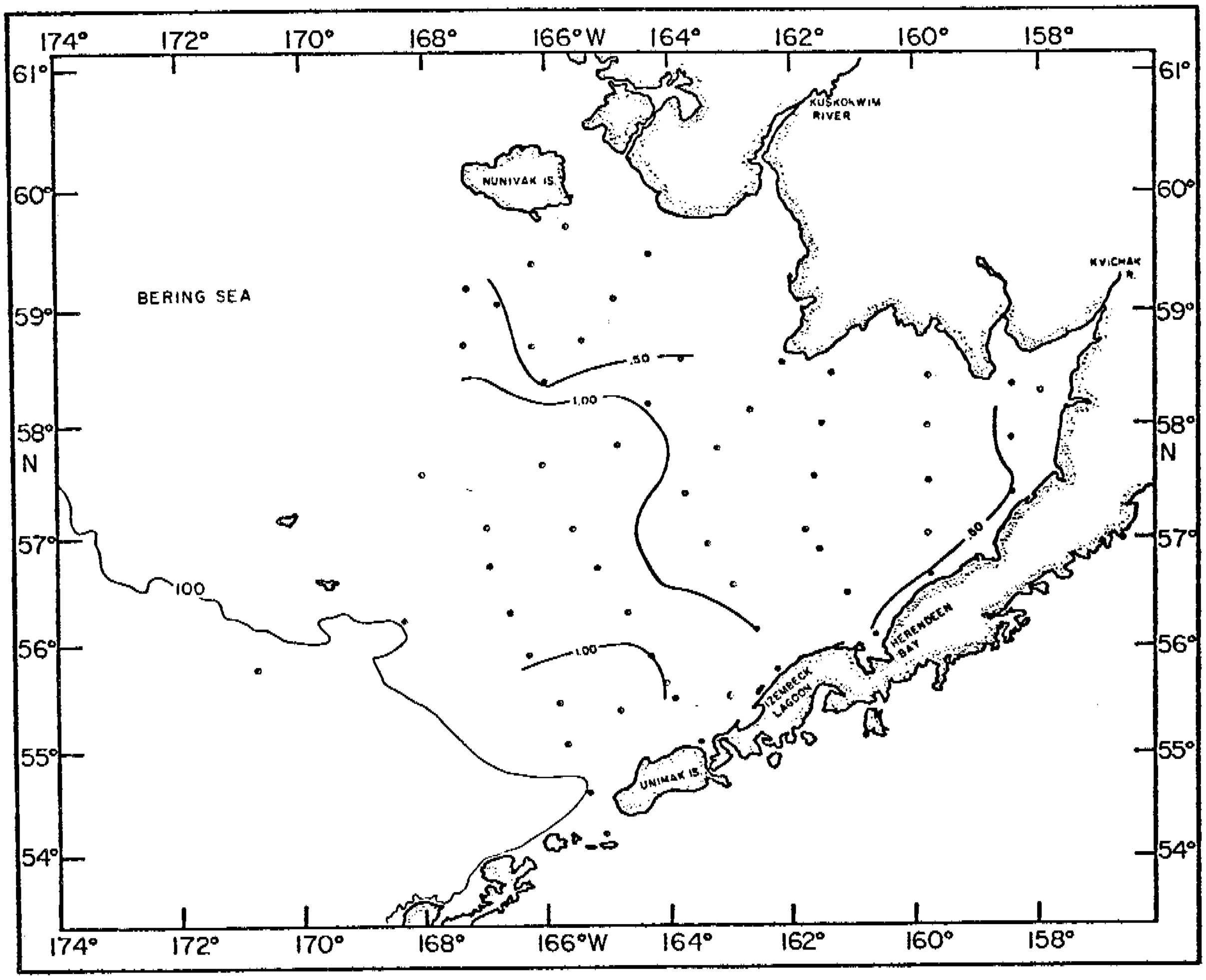
Concentrations of ethylene showed no discernible spatial patterns. The range of values observed fell between 0.1 and 1.5 nℓ/ℓ, the highest concentrations normally occurred near the bottom. Average surface values were identical to the ethane average of 0.5 nℓ/ℓ.

In general, ethane and ethylene increased with depth and correlated with methane concentrations. This situation is graphically displayed in Figure 6-5 for all samples. Although the correlation is not good, the trend suggests a common source for these homologs.

6.13 Distributions of Propane, Propylene, Isobutane and n-Butane

The distribution of propane plus propylene in the surface waters of Bristol Bay shows little spatial variation (Figure 6-6). Concentrations range from a low of 0.3 nℓ/ℓ to a high of 0.9 nℓ/ℓ. The average for all samples is 0.5 nℓ/ℓ. Because of incomplete chromatographic separation of propane and propylene during segments of the cruise, the integrated

Figure 6-4 Areal distribution of ethane 5 m from the bottom in Bristol Bay during Sept-Oct. 1975. Concentrations are given in nℓ/ℓ (NPT).



174°
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60°
59°
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N
57°
56°
55°
54°
NUNIVAK IS.
KUSKOKWIM RIVER
KVICHAK R.
BERING SEA
.50
1.00
.80
100
IZEMBECK LAGOON
HERENDEEN BAY
UNIMAK IS.

Figure 6-5 Methane versus ethane for all samples analyzed in Bristol Bay.

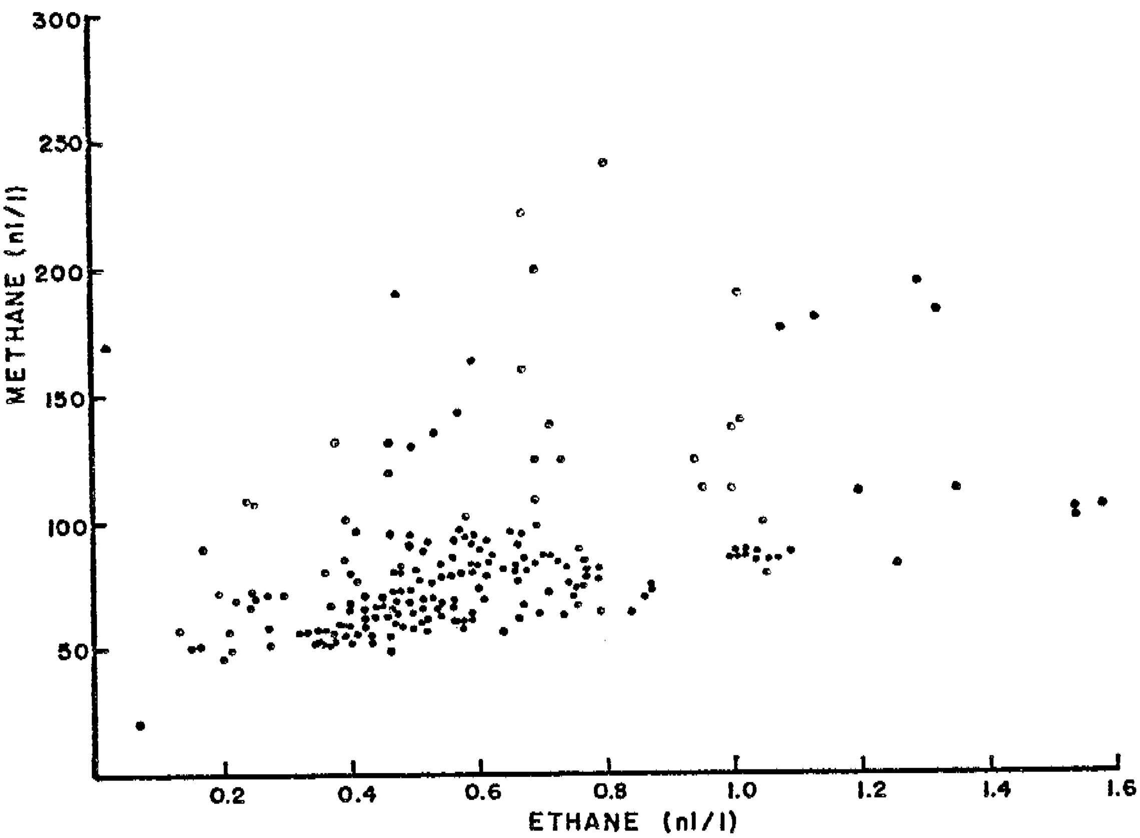
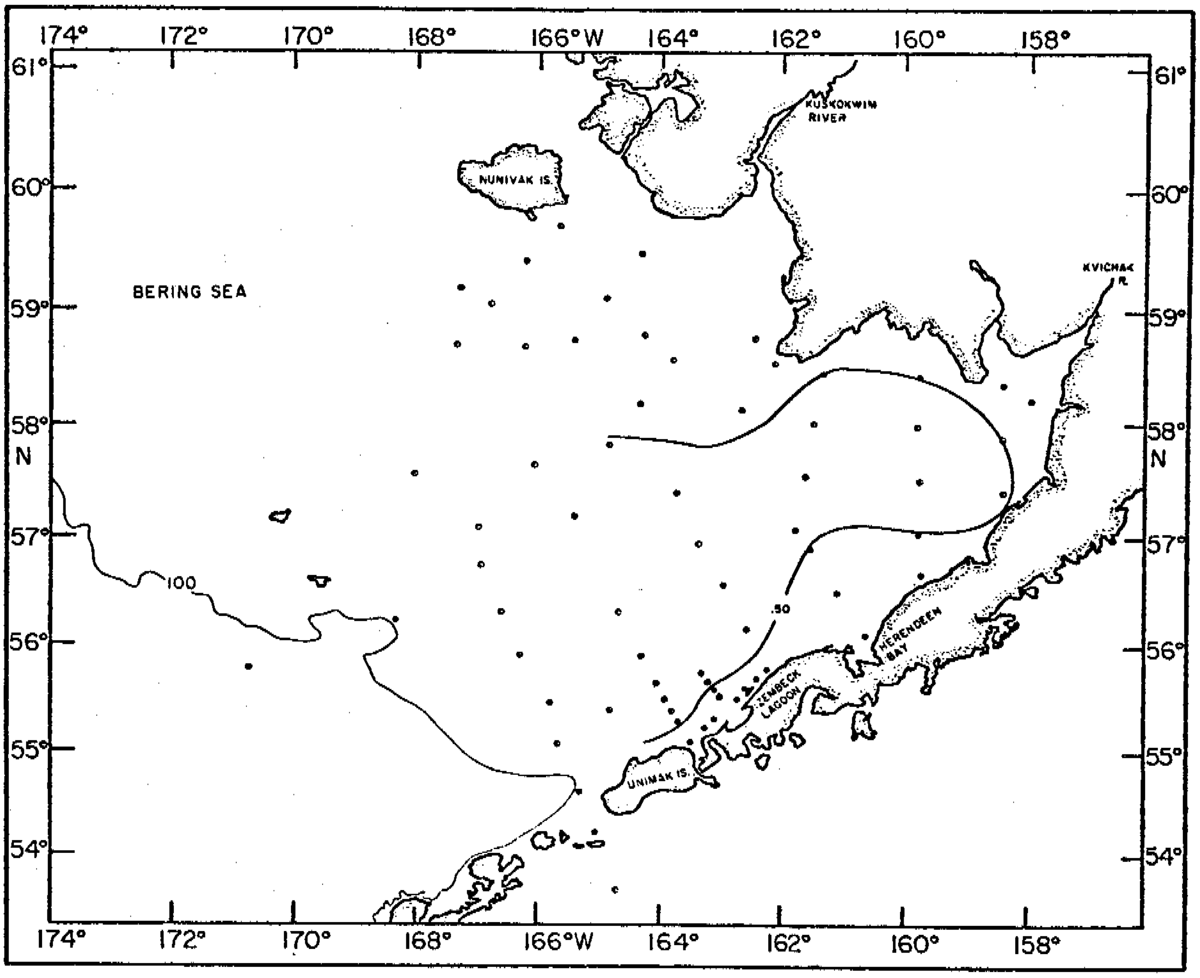

300
250
200
150
100
50
METHANE (nl/l)
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
ETHANE (nl/l)

Figure 6-6 Surface distribution of propane plus propylene in Bristol Bay during Sept-Oct. 1975. Concentrations are given in nℓ/ℓ (NPT). Approximately 2/3 of the total is propylene, based on complete chromatographic analysis at selected stations.


174°
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158°
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60°
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58°
N
57°
56°
55°
54°
BERING SEA
NUNIVAK IS.
KUSKOKWIM RIVER
KVICHAK R.
100
UNIMAK IS.
ZEMBECK LAGOON
HERENDEEN BAY

responses for the two components were combined. From the analyses of samples in which separation was effected, it appears that propylene equals or exceeds the concentration of propane. Most samples showed an enrichment of propylene over propane by a factor of 2.

Near-bottom concentrations of propane plus propylene indicate two major source areas as depicted in Figure 6-7. One near Herendeen Bay, the other in the central portion of Bristol Bay. As cited above, approximately 2/3 of the total is propylene. The average for all bottom samples is near 0.4 nℓ/ℓ, only slightly less than the surface values. The absence of a bottom source for propane and propylene, combined with strong vertical mixing would result in a homogeneous water column with respect to these components.

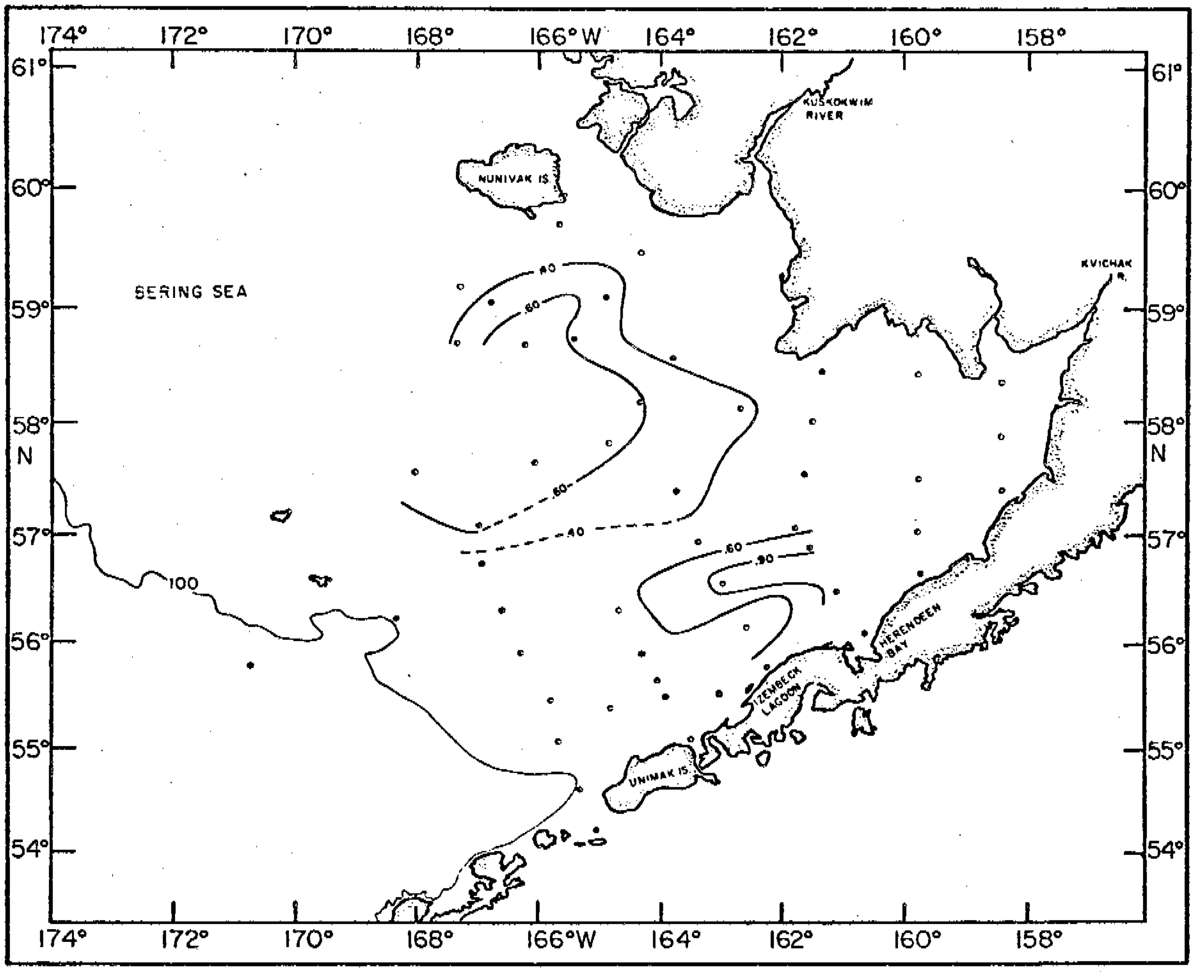
The concentrations of the C_4's are not shown since their concentrations were everywhere near or below the detection limit. Normally, the concentrations of n-butane ranged from a trace (0.03 nℓ/ℓ) to approximately 0.1 nℓ/ℓ. Higher concentrations were observed during the initial phase of the cruise, but contaminated water samplers were thought to be the cause.

6.14 Time Series

Short-term temporal changes in hydrocarbons were monitored at stations EBBS-37 (36 hours) and PMEL-46 (24 hours). These results are shown in terms of the time variation of methane at the surface and near-bottom (Figure 6-8).

Station 37, located in central Bristol Bay, showed systematic variations in methane in the surface layers and almost none in the near-bottom layer. Variations seen in the bottom layer largely reflect analytical imprecision. The periodicity seen in the surface layers is probably related

Figure 6-7 Areal distribution of propane plus propylene 5 m from the bottom in Bristol Bay during Sept-Oct. 1975. Concentrations are given in nℓ/ℓ (NPT. Approximately 2/3 of the total is propylene, based on complete chromatographic analysis at selected stations.


174°
172°
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166°W
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160°
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60°
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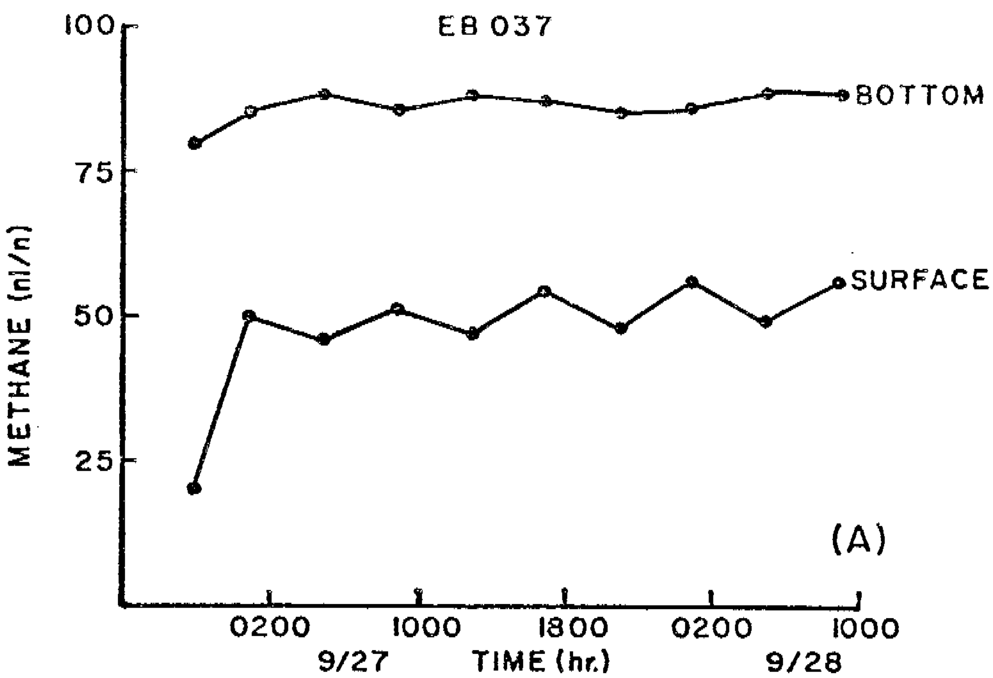
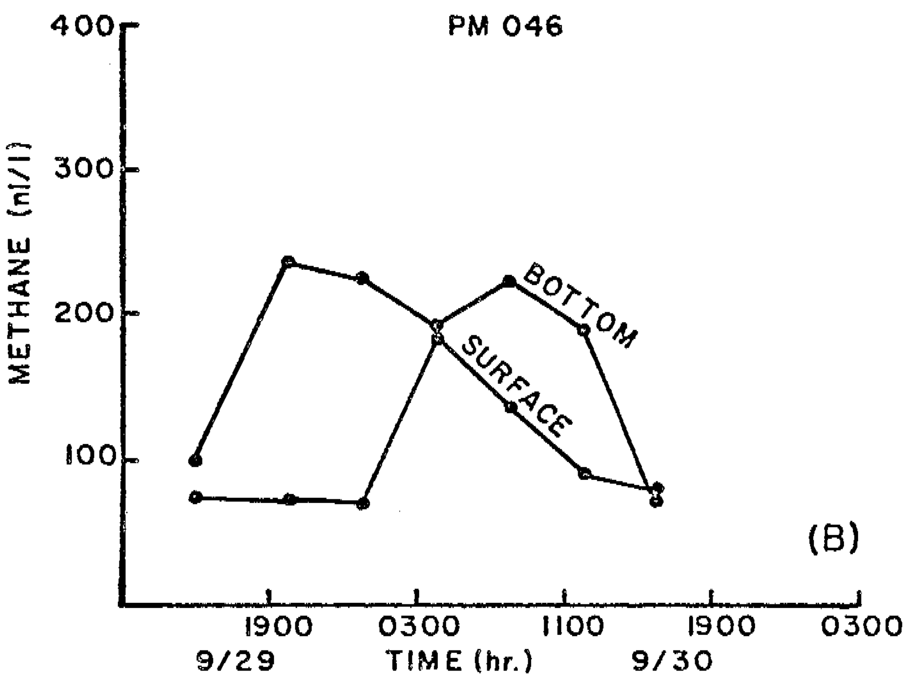
N
57°
56°
55°
54°
BERING SEA
NUNIVAK IS.
KUSKOKWIM RIVER
KVICHAK R.
HERENDEEN BAY
IZEMBECK LAGOON
UNIMAK IS.
100
.40
.60
.90

Figure 6-8 Diurnal variations in the concentration of methane at the surface and 5 m from the bottom at stations EB 037(A) and PM 046(B) in Bristol Bay. Observations were conducted in late September 1975.


EB 037
100
75
50
25
METHANE (nl/n)
BOTTOM
SURFACE
(A)
0200
1000
1800
0200
1000
9/27
TIME (hr.)
9/28


PM 046
400
300
200
100
METHANE (nl/l)
BOTTOM
SURFACE
(B)
1900
0300
1100
1900
0300
9/29
TIME (hr.)
9/30

to tidal components, although it is impossible at this time to be specific about the actual source of the perturbations.

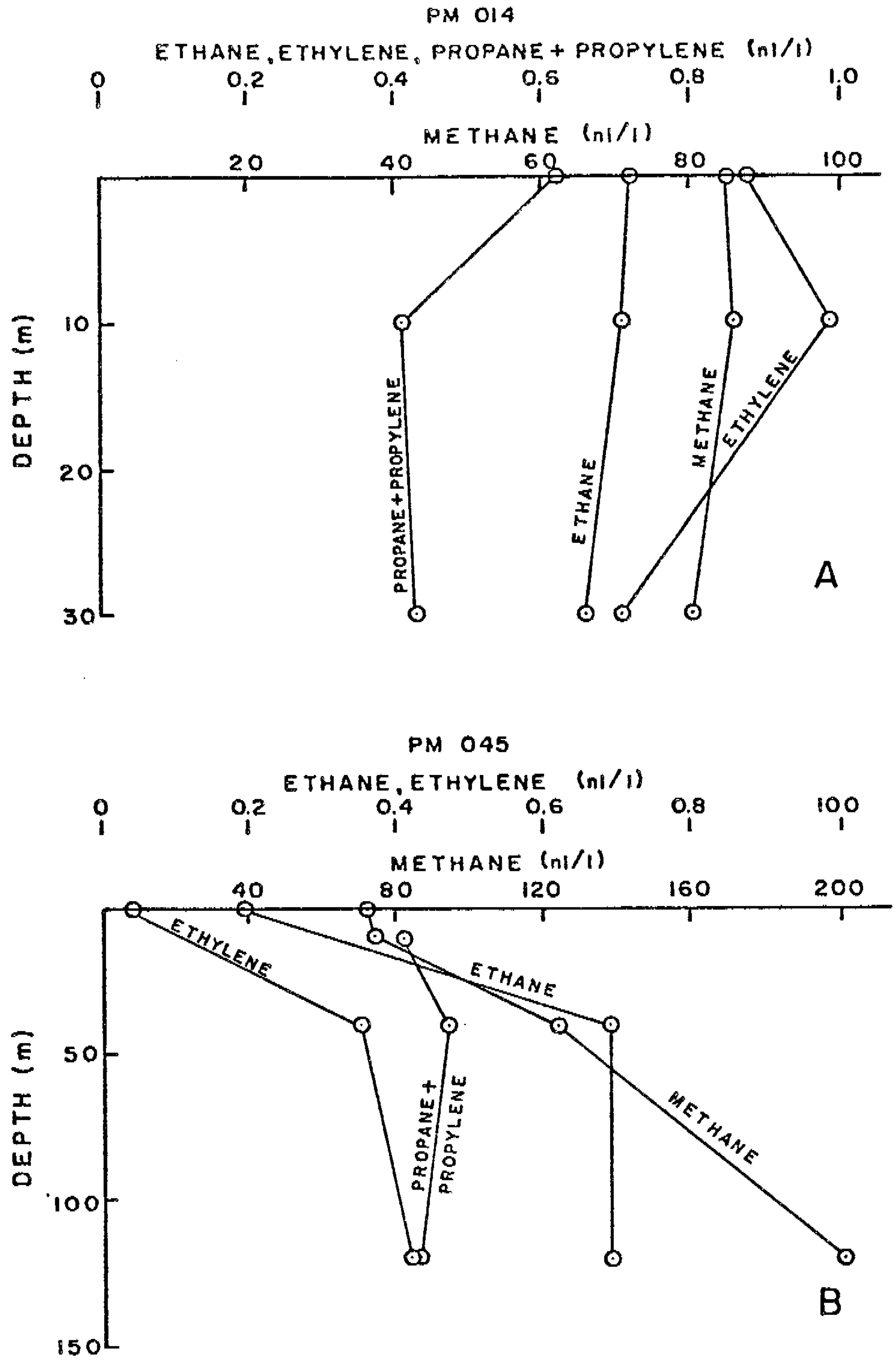
In contrast to the rather static conditions at station 37, large perturbations were observed in the Unimak Pass area. Over a 24-hour period, bottom methane concentrations varied by more than a factor of 2 (Figure 6-8B). Again, the periodicity suggests tidal influences, but here the relationships between source areas and circulation become quite important (cf. Figures 6-1 and 6-2). We propose that the large perturbations seen in the near-bottom layer are related to the large benthic methane source to the north, whereas low concentrations of methane may represent additions of water depleted in methane. The source of this water is probably to the east or south.

The maximum surface methane concentration noted at 0400 hrs may represent the biological production of methane in the upper layers. Complete analysis of the vertical profile taken at this time reveals that the water column was rather uniform with respect to methane, but not temperature. The concentration of methane increased from a surface concentration of 190 nℓ/ℓ to 260 nℓ/ℓ at 11 m, then decreased monitonically with depth to a near-bottom value of 185 nℓ/ℓ. The intermediate maximum in methane concentration may be biologically related (Lamontagne *et al.*, 1973b).

6.15 Typical Vertical Profiles

Typical vertical profiles of methane, ethane, ethylene, and propane plus propylene are shown in Figure 6-9A,B for two stations in Bristol Bay. Although it is difficult to choose a typical profile from any of the regions, the occurrence of ethane and ethylene appears to correlate with methane concentrations as noted earlier. The two stations chosen represent

Figure 6-9 Vertical distributions of methane, ethane, ethylene, and propane plus propylene at stations PM 014(A) and PM 045 (B) in Bristol Bay during Sept-Oct. 1975.


PM 014
ETHANE, ETHYLENE, PROPANE + PROPYLENE (nl/l)
0
0.2
0.4
0.6
0.8
1.0
METHANE (nl/l)
20
40
60
80
100
DEPTH (m)
10
20
30
PROPANE + PROPYLENE
ETHANE
METHANE
ETHYLENE
A
PM 045
ETHANE, ETHYLENE (nl/l)
0
0.2
0.4
0.6
0.8
100
METHANE (nl/l)
40
80
120
160
200
DEPTH (m)
50
100
150
ETHYLENE
ETHANE
PROPANE + PROPYLENE
METHANE
B

diverse benthic environments in order to identify the importance of the oottom in regulating hydrocarbon concentrations. PMEL-14 (Figure 6-9A) is located near Cape Newenham and shows little bottom influence on the distributions of hydrocarbons. The sediments here are coarse-grained and the organic carbon concentrations is low (Sharma, 1974).

In contrast, station 45 (Figure 6-9B) located just to the north of Unimak Pass shows striking increases in methane, ethane, and ethylene with water depth. Again, propane and propylene do not appear to be generated within the sediment column.

As new data become available, hydrocarbon distributions will be analyzed in terms of biological parameters and sedimentological provinces to clarify the significance of surface productivity and CO_2 reduction in sediments.

6.2 Northeast Gulf of Alaska

A total of 51 stations were occupied in the northeast Gulf of Alaska, including Prince William Sound. The station grid, shown in Figure 4-2, was developed for the survey of suspended particulate matter and was adopted for this program as well.

Sample analysis included 274 normal depths and 84 samples arising from time series at stations 46 and 62. These hydrocarbon analyses were supplemented by an intense near-bottom study off the southern tip of Kayak Island in which two 5-1 Niskin bottles were suspended 2 and 4 m above the bottom. Hydrocasting was conducted along the surface exposure of the 10-fathom fault line, which was suggested as a possible source of hydrocarbons (Dr. Bruce Molnia, USGS, Menlo Park).

The results of these findings will be described in terms of areal distributions of significant hydrocarbons, their relationship to known source regions, and their temporal variability. As mentioned above, complete analysis of the hydrocarbon data in terms of hydrographic parameters has not been completed, but will be included in the final report (October 1976).

6.21 Areal Distribution of Methane

Surface methane concentrations over the shelf region were generally high. Concentrations of methane rarely fell below 100 nℓ/ℓ except at stations seaward of the shelf break (Figure 6-10). Extremely high surface concentrations of methane were observed in the vicinity of Kayak Island as shown in Figure 6-10. The source of this methane may be the underlying sediments, but a cursory analysis of the vertical distributions at each of the stations often reveals a subsurface maximum in the concentrations of methane. It is indeed unusual to observe high concentrations of methane in surface waters where atmospheric exchange should rapidly reduce to the concentrations to 50-70 nℓ/ℓ, particularly under conditions of intense wind mixing (Broecker and Peng, 1974).

It is possible that the high methane values observed near Kayak Island are due to gas seeps, however, as we shall see later; the ethane and propane components are not abnormal, at least not abnormally high compared to other shelf areas investigated.

In Figure 6-11 is shown the near-bottom distribution of methane. Concentrations of methane do not fall below 200 nℓ/ℓ in the survey region, with an intense maximum centered south of Hinchinbrook Entrance. Actual near-bottom methane concentration at station 45 was 1577 nℓ/ℓ, the highest

Figure 6-10 Surface distribution of methane in the northeast Gulf of Alaska during Oct-Nov. 1975. Concentrations are given in nℓ/ℓ (NPT).

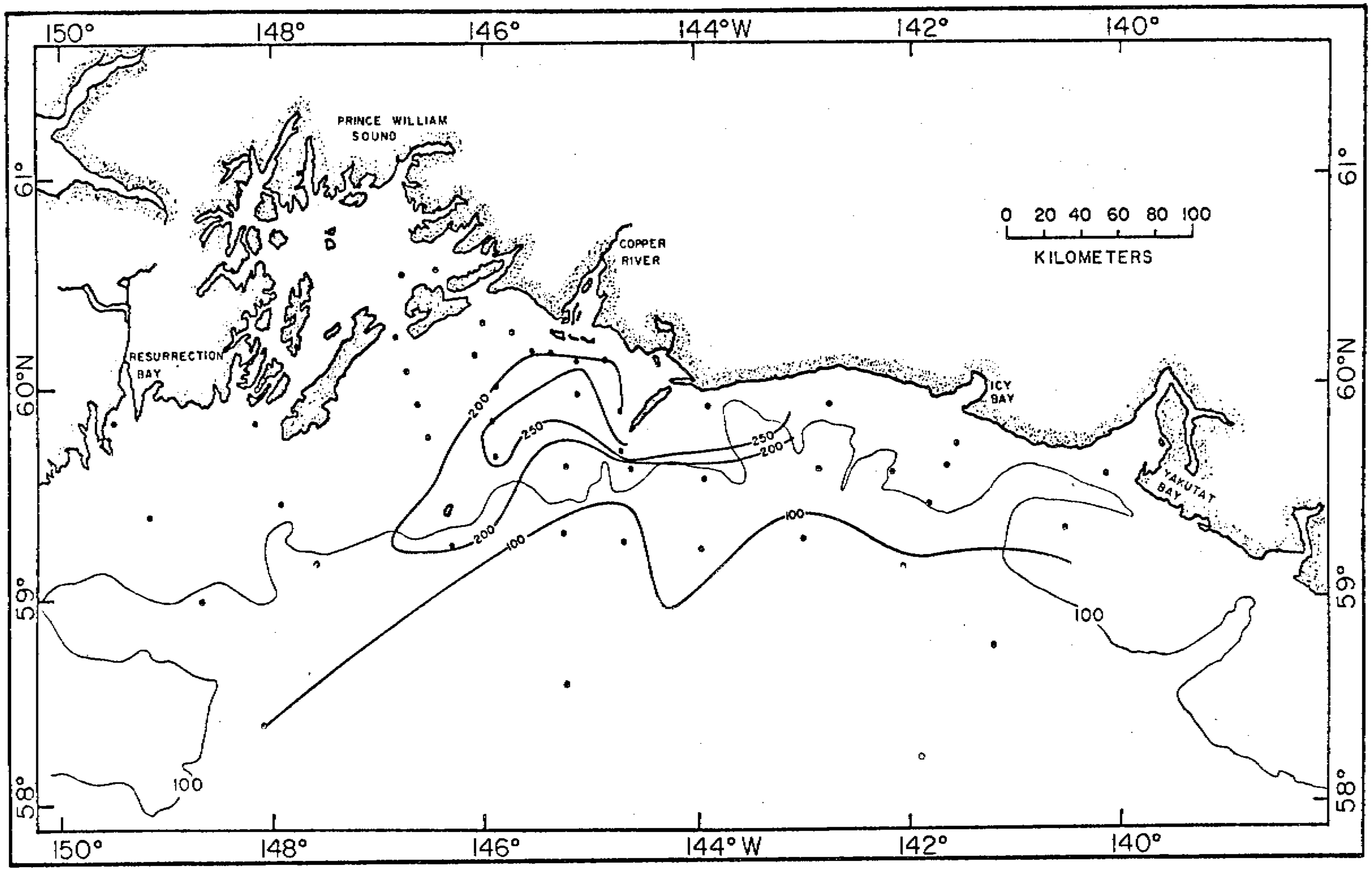
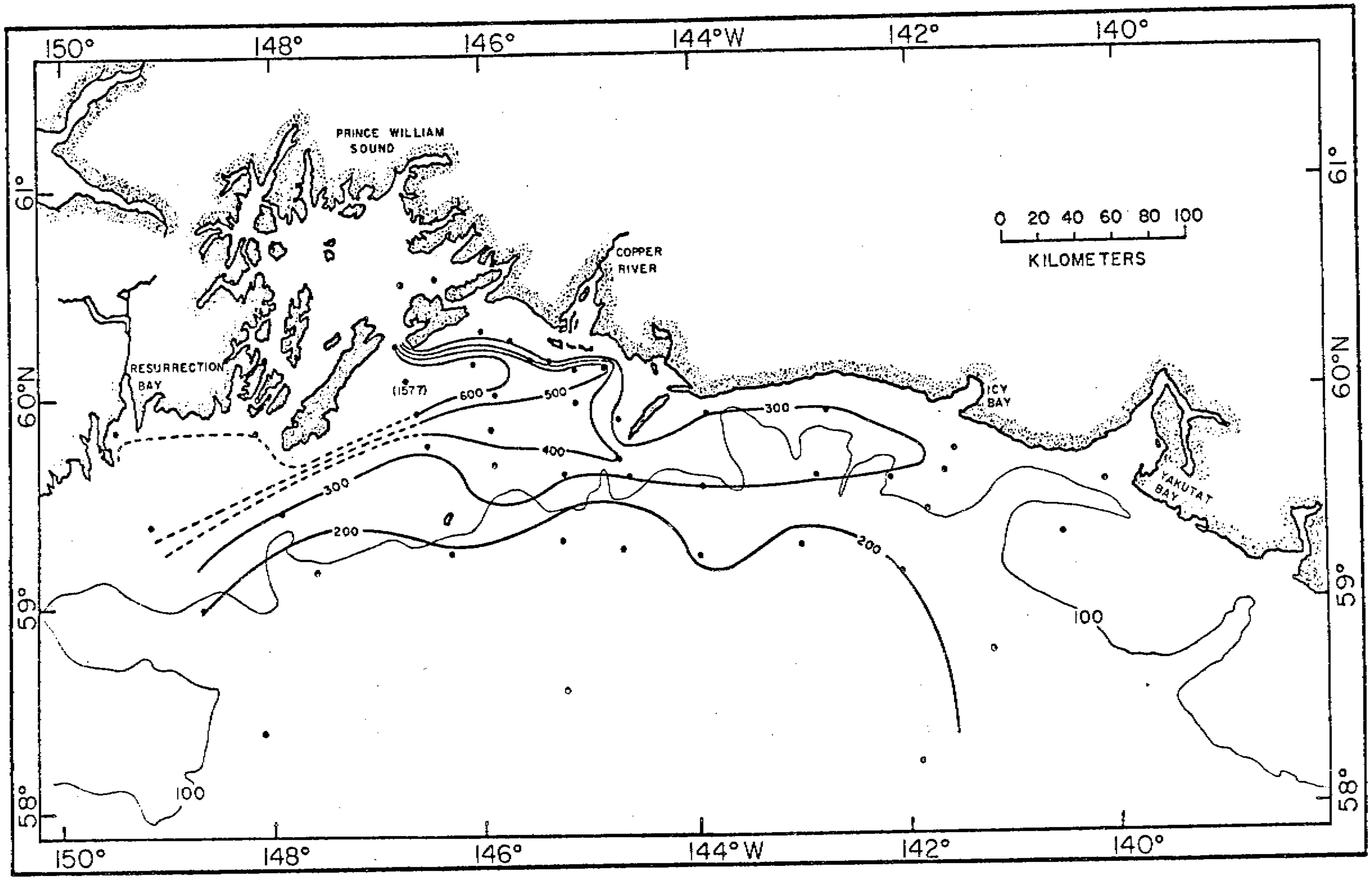

150°
148°
146°
144°W
142°
140°
61°
60°N
59°
58°
PRINCE WILLIAM SOUND
COPPER RIVER
RESURRECTION BAY
ICY BAY
YAKUTAT BAY
0 20 40 60 80 100
KILOMETERS
200
250
100

Figure 6-11 Areal distribution of methane 5 m from the bottom in the northeast Gulf of Alaska during Oct-Nov. 1975. Concentrations are given in $n\ell/\ell$ (NPT).


PRINCE WILLIAM SOUND
COPPER RIVER
RESURRECTION BAY
ICY BAY
YAKUTAT BAY
0 20 40 60 80 100
KILOMETERS
150°
148°
146°
144°W
142°
140°
61°
60°N
59°
58°
(1577)
600
500
400
300
200
100

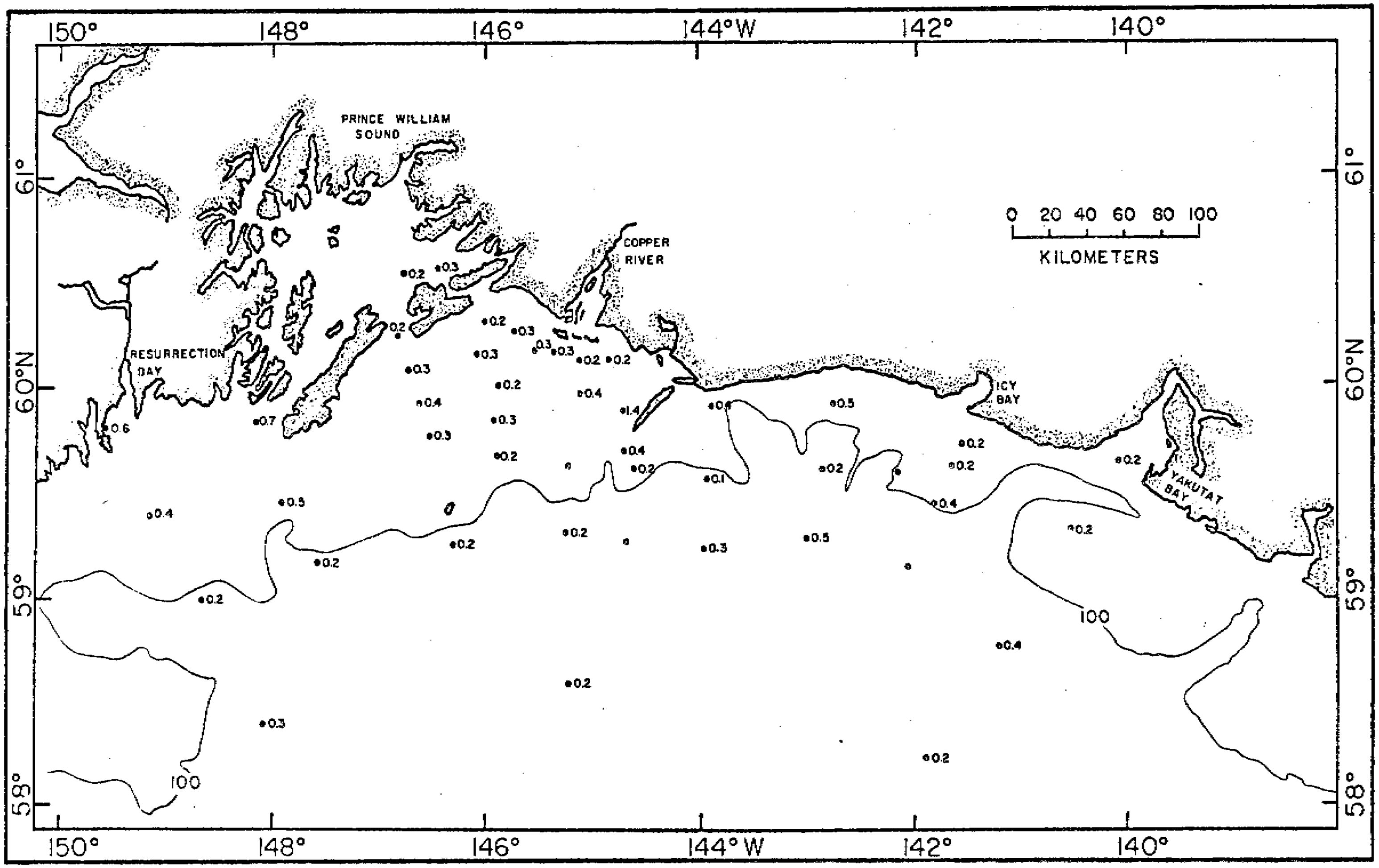
value measured anywhere to date on the OCS of Alaska, Because station positions near Montague Island were not sufficiently dense, the actual source of the methane is not known. Based on the observations made at stations 43 and 44, it would appear that Prince William Sound is not the source.

The trajectory of the methane plume is east across Tarr Bank, a topographic high consisting of coarse-grained relict Holocene sediments, toward the Copper River delta. Without knowledge of the magnitude of the benthic sources in the region, it would appear that methane generated near Montague Island moves under the Copper River plume in response to estuarine circulation. Sampling occurred in early November and it is presumed that river discharge was low at this time of the year, thereby reducing the normal estuarine driving mechanism. A methane source to the west and north of Tarr Bank is suggested because of the occurrence of clayey muds, presumably high in organic carbon. Methane distributions in the near-surface sediments are required to resolve the extent and magnitude of the bottom source.

6.22 Areal Distribution of Ethane and Ethylene

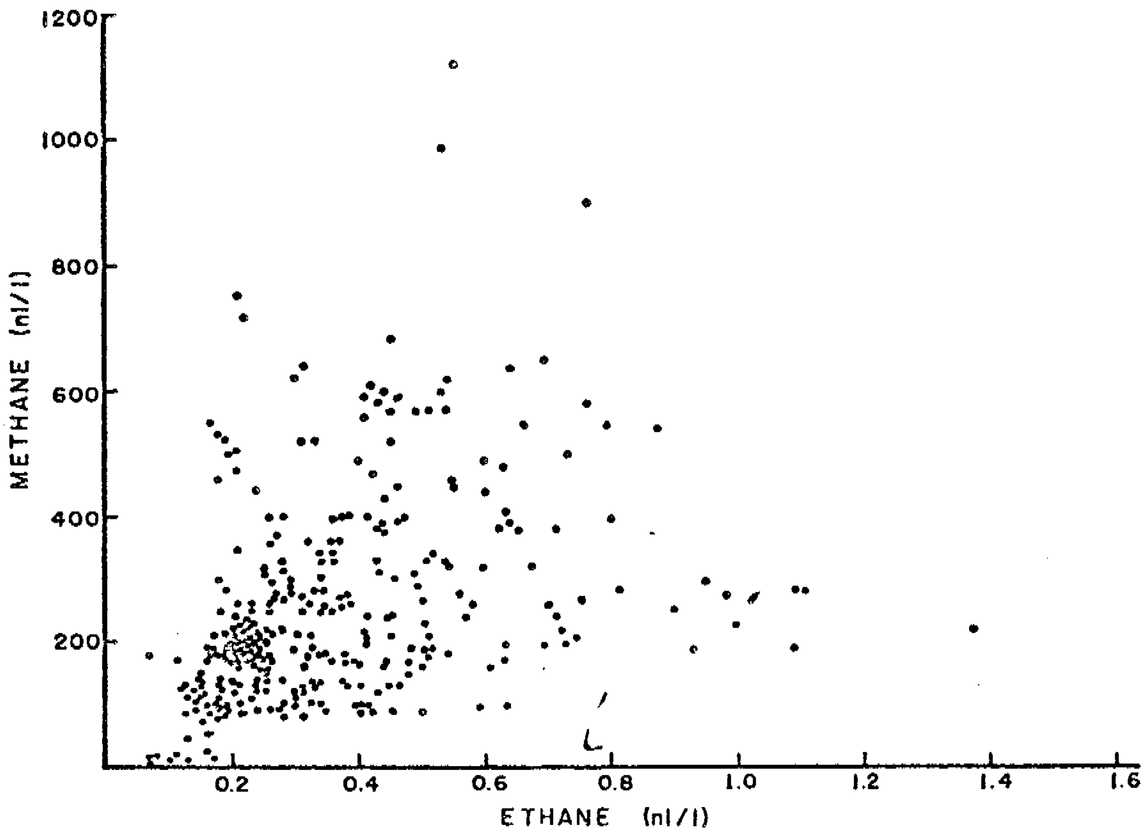
The surface distribution of ethane is shown in Figure 6-12. There is no discernible areal pattern except for highly localized maxima and minima. The average surface concentration is 0.3 $n\ell/\ell$ with a standard deviation of 0 ± 0.2 $n\ell/\ell$. A single high value of 1.4 $n\ell/\ell$ was observed west of Kayak Island, but its significance is not known at this time. A plot of ethane vs. methane for all samples is shown in Figure 6-13. The correlation is poor, but the trend suggests a common source for methane and ethane. A low methane-ethane ratio would indicate a possible petroleum source.

Figure 6-12 Surface distribution of ethane in the northeast Gulf of Alaska during Oct-Nov. 1975. Concentrations are given in nℓ/ℓ (NPT).



PRINCE WILLIAM SOUND
COPPER RIVER
RESURRECTION BAY
ICY BAY
YAKUTAT BAY
0 20 40 60 80 100
KILOMETERS
150°
148°
146°
144°W
142°
140°
61°
60°N
59°
58°
100

Figure 6-13 Methane versus ethane for all samples analyzed in the northeast Gulf of Alaska.


1200
1000
800
600
400
200
METHANE (nl/l)
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
ETHANE (nl/l)

The surface distribution of ethylene is similar to that of ethane, showing localized maxima and minima. In general, the concentrations are higher than ethane and reveal larger spatial variability. The average surface value was 0.7 $n\ell/\ell$ with a standard deviation of the mean of ±0.20 $n\ell/\ell$.

Near-bottom ethane concentrations are presented in Figure 6-14. In general, the concentrations are greater than those observed at the surface, again indicating a sediment source. Slightly elevated concentrations of ethane were observed in the vicinity of Kayak Island, but the source of the ethane and its significance is not known at this time. Similarly, relatively high ethane values were observed south of Resurrection Bay. The average near-bottom ethane concentration is 0.5 $n\ell/\ell$, with a standard deviation of ±0.2 $n\ell/\ell$.

Analogous to the ethane distribution, the near-bottom ethylene distribution is variable and correlative with distribution of methane. These observations are indicated in Figure 6-15.

In general, elevated ethylene concentrations are observed in the shallow shelf region, and in particular the area south of the Copper River and Kayak Island. The average near-bottom concentration of ethylene in the shelf area is 1.1 $n\ell/\ell$ with a standard deviation of the mean of ±0.3 $n\ell/\ell$. In general, lower concentrations are observed offshore at shelf depths and to the east in the region of Icy Bay and Yakutat Bay.

6.23 Propane, Propylene, Isobutane and n-Butane

Surface values of propane show little variation throughout the entire survey region, except in the vicinity of Kayak Island. The average surface value for all samples is 0.2 $n\ell/\ell$ with a standard deviation of the mean of ±0.1 $n\ell/\ell$. To the west and south of Kayak Island, surface propane concentrations are in the range 0.3-0.4 $n\ell/\ell$.

Figure 6-14 Areal distribution of ethane 5 m from the bottom in the northeast Gulf of Alaska during Oct-Nov. 1975. Concentrations are given in nℓ/ℓ (NPT).

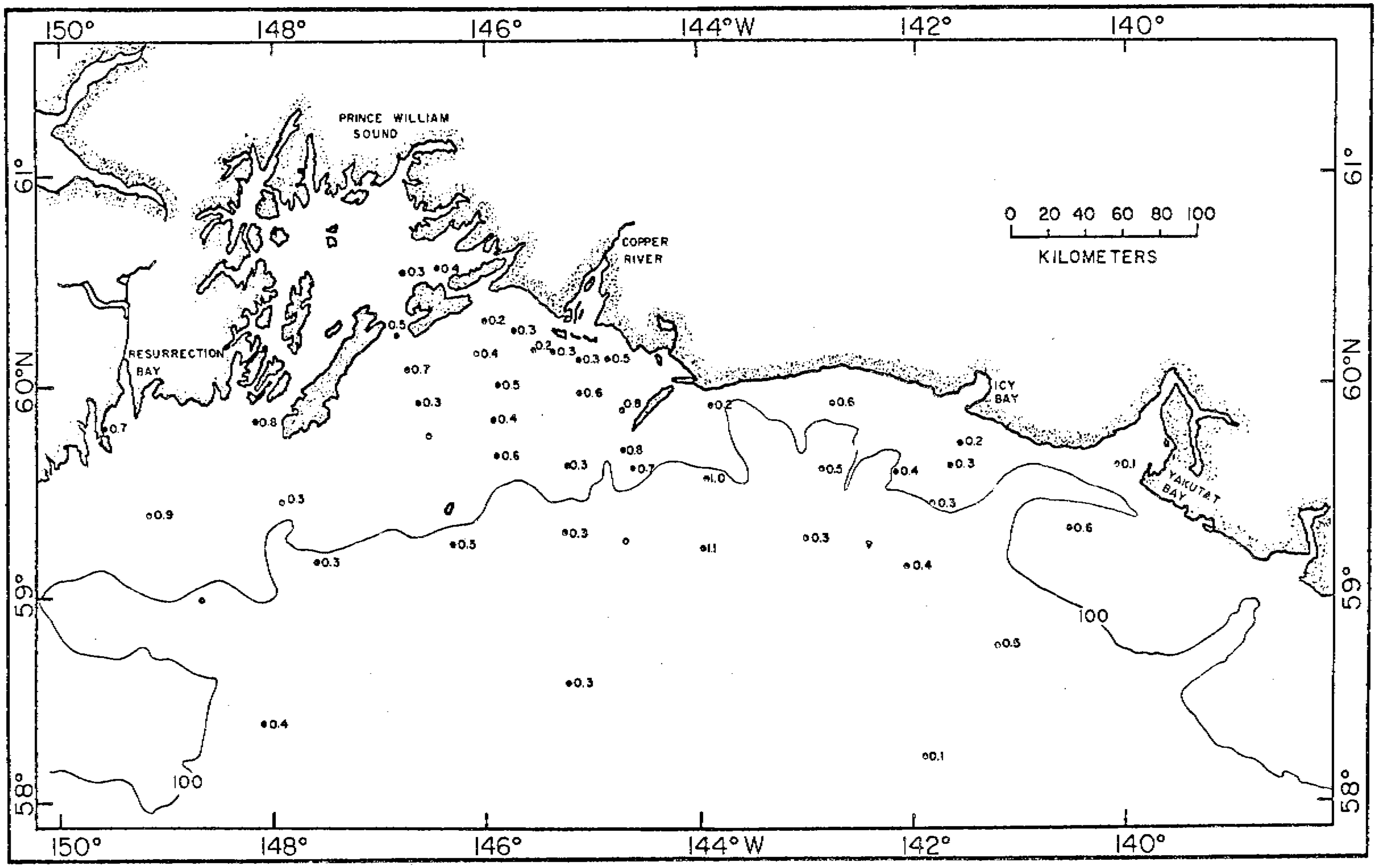
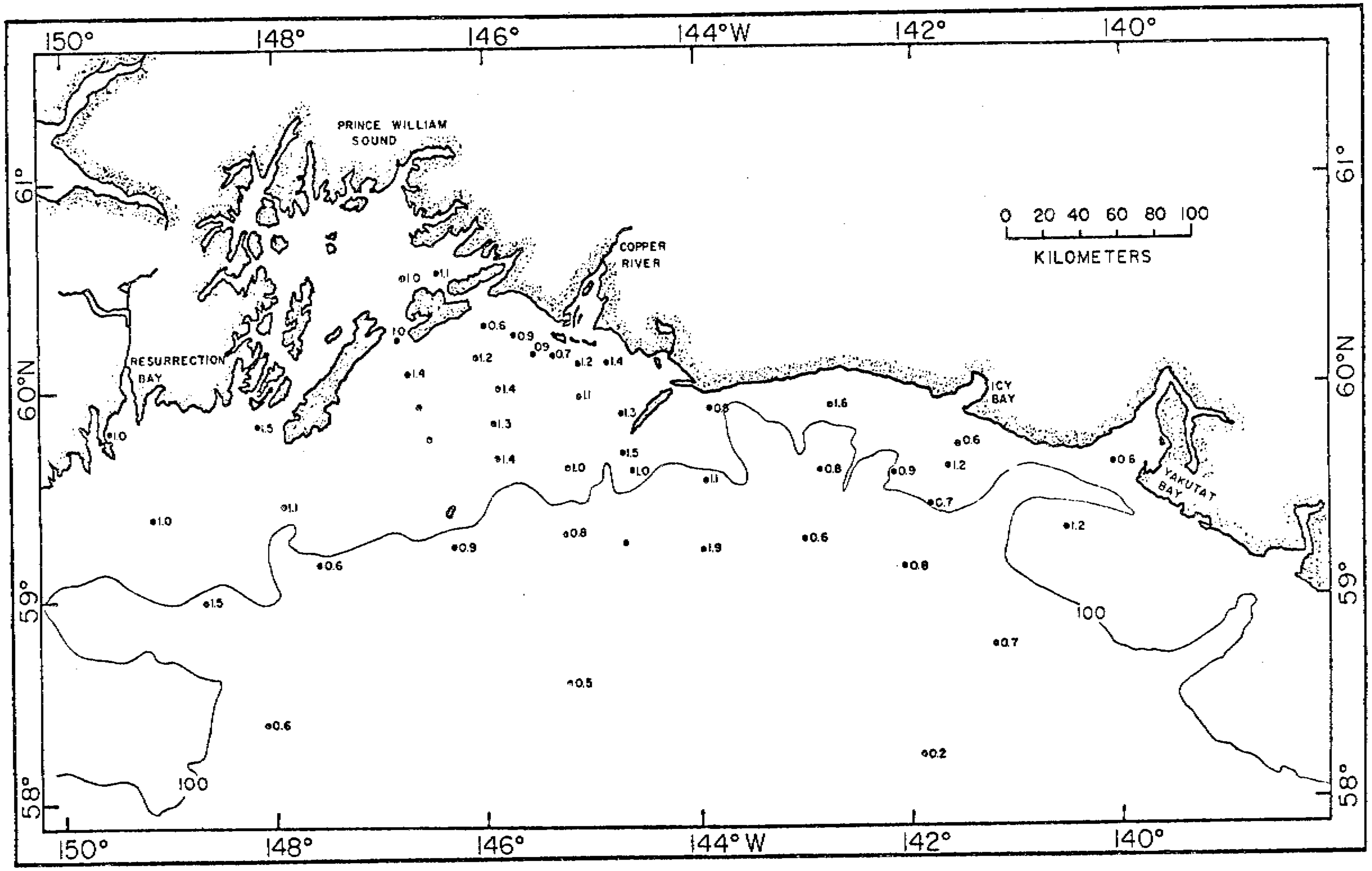

150°
148°
146°
144°W
142°
140°
61°
60°N
59°
58°
PRINCE WILLIAM SOUND
COPPER RIVER
RESURRECTION BAY
ICY BAY
YAKUTAT BAY
0 20 40 60 80 100
KILOMETERS
100

Figure 6-15 Areal distribution of ethylene 5 m from the bottom in the northeast Gulf of Alaska during Oct-Nov. 1975. Concentrations are given in nℓ/ℓ (NPT).


150°
148°
146°
144°W
142°
140°
61°
60°N
59°
58°
PRINCE WILLIAM SOUND
COPPER RIVER
RESURRECTION BAY
ICY BAY
YAKUTAT BAY
0 20 40 60 80 100
KILOMETERS
100

The concentrations of propane 5 m above the bottom are shown in Figure 6-16. The distribution is spatially uniform with an average value of 0.2 nℓ/ℓ and a standard deviation of the mean of ±0.04 nℓ/ℓ. The elevated propane values observed in the surface waters west and south of Kayak Island are not reflected in the near-bottom concentrations.

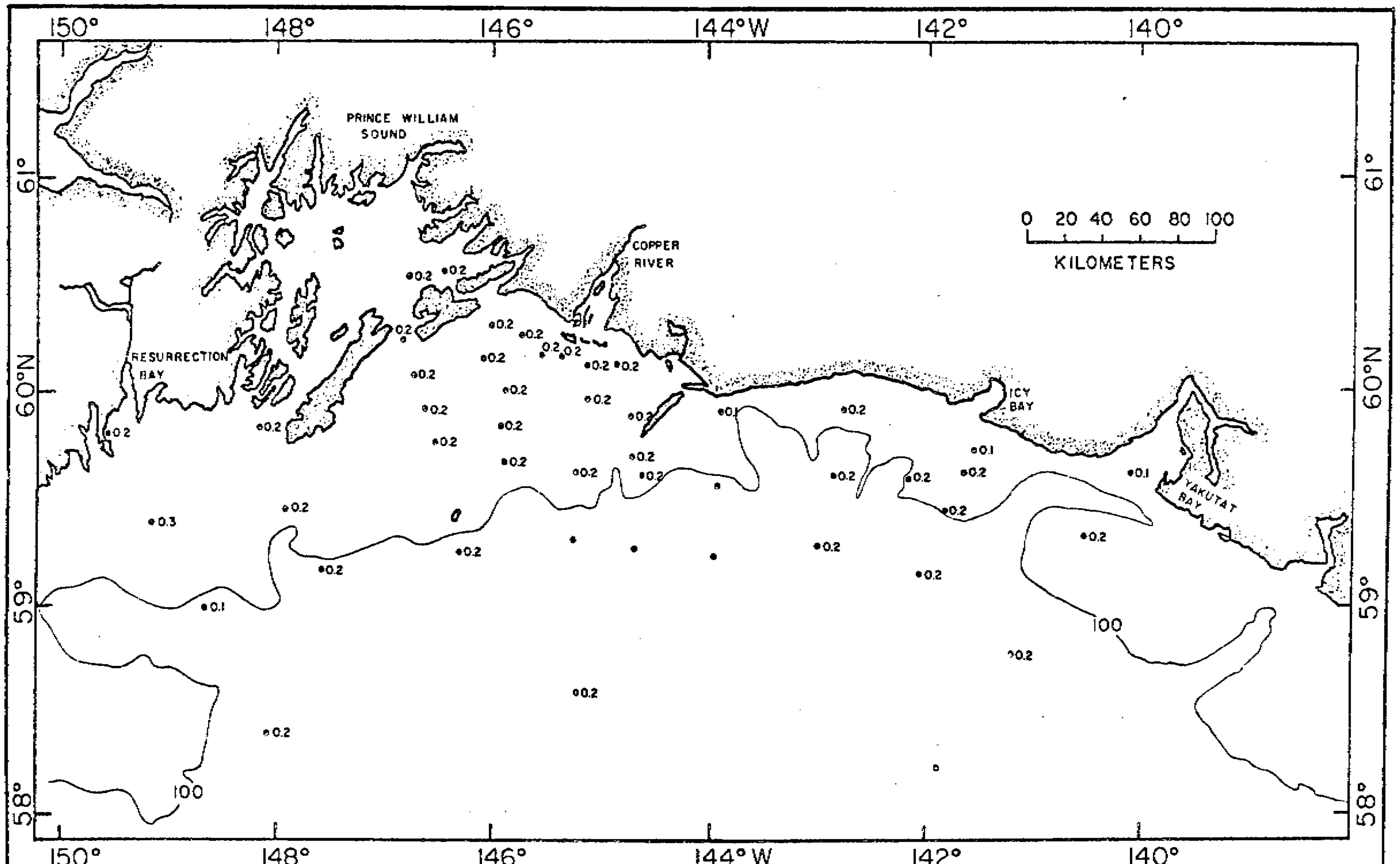
Propylene concentrations over the shelf were uniformly at or below the detection limit of 0.04 nℓ/ℓ at both the surface and at depth. Again, west and south of Kayak Island, measurable concentrations were observed, the range being 0.2 to 0.3 nℓ/ℓ. Chromatographic difficulties were encountered in the separation of propane and propylene, resulting in many incomplete peak integrations. Even so, it is apparent that the concentration of propylene was uniformly low throughout the region, which may have been caused by the late season and a corresponding reduction in photosynthetic activity (Lamontagne *et al.*, 1973a).

Isobutane and n-butane concentrations were everywhere below the detection limit of 0.03 nℓ/ℓ.

6.24 Time Series

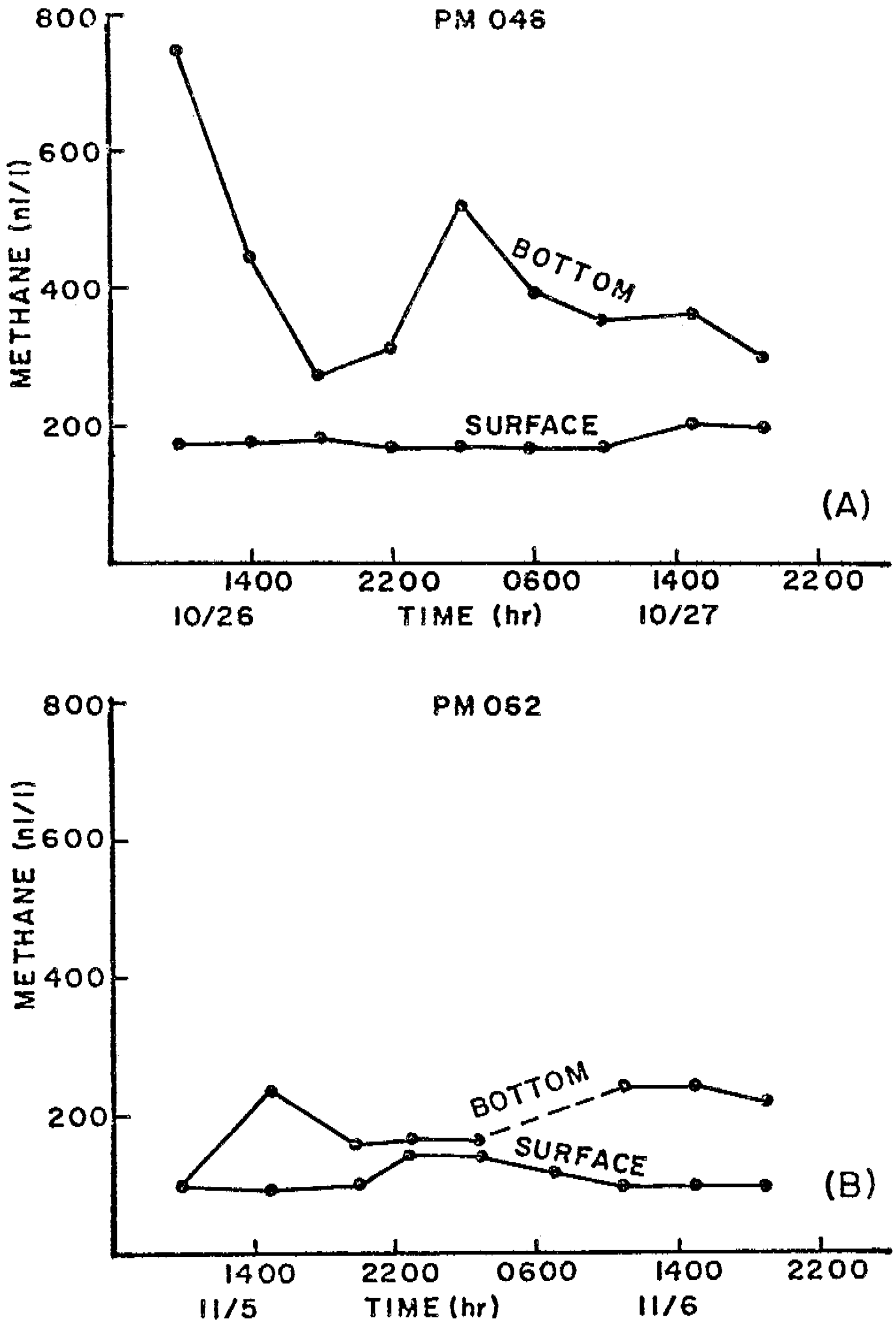
Two 36-hour time series were taken at stations 46 and 62 (Figure 4-2). The results of this study are depicted in Figure 6-17A,B. Station 46 is located on Tarr Bank, a region already shown to be characterized by high methane concentrations and strong lateral gradients. The bottom temporal sequence shows an eight-hour periodicity, characterized by assymetrical amplitudes (Figure 6-17A). It is unfortunate that a longer time sequence could not be taken in order to document the frequency of the major perturbations. Surface values were nearly invariant, suggesting little vertical exchange with water rich in methane from below.

Figure 6-16 Areal distribution of propane 5 m from the bottom in the northeast Gulf of Alaska during Oct-Nov. 1975. Concentrations are given in nℓ/ℓ.



150°
148°
146°
144°W
142°
140°
61°
60°N
59°
58°
PRINCE WILLIAM SOUND
COPPER RIVER
RESURRECTION BAY
ICY BAY
YAKUTAT BAY
0 20 40 60 80 100
KILOMETERS
100
100

Figure 6-17 Diurnal variations in the concentration of methane at the surface and 5 m from the bottom at stations PM 046(A) and PM 062(B). Observations were conducted in the northeast Gulf of Alaska during Oct-Nov. 1975.


PM 046
METHANE (nl/l)
800
600
400
200
BOTTOM
SURFACE
(A)
1400
2200
0600
1400
2200
10/26
TIME (hr)
10/27
PM 062
METHANE (nl/l)
800
600
400
200
BOTTOM
SURFACE
(B)
1400
2200
0600
1400
2200
11/5
TIME (hr)
11/6

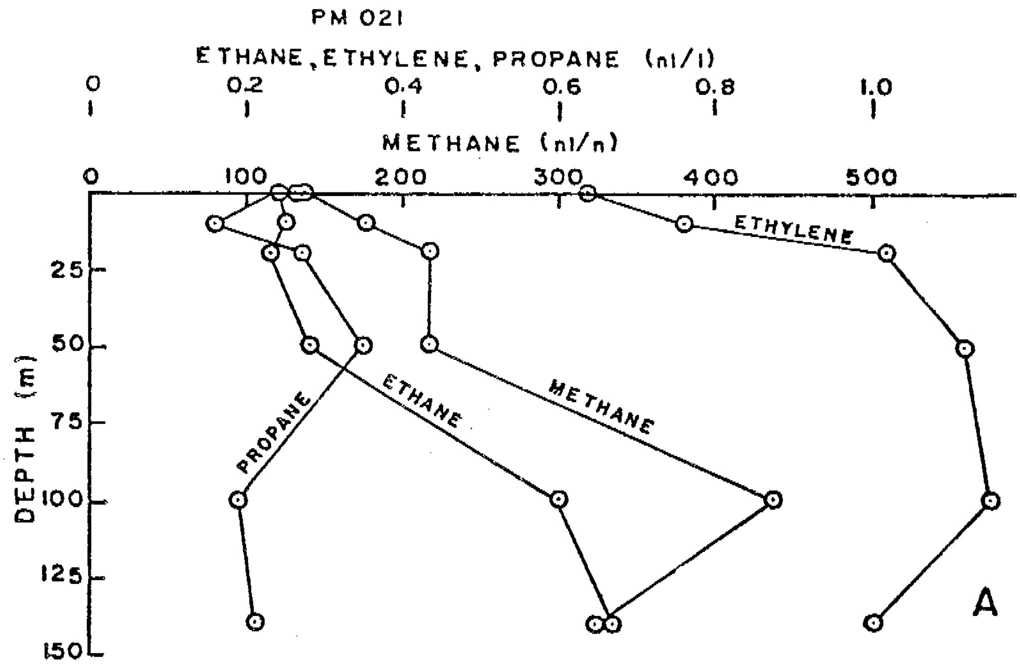
Temporal variability of methane at station 62 is depicted in Figure 6-17B. Unlike the near-bottom observations at station 46, only modest excursions in methane were observed during the time series. Complete analysis of the mean flow and tidal current measurements has not been completed, but the modest changes in the concentration of methane reflect the fact that no large localized sources of methane exist in close proximity of station 62. Assuming mean tidal velocities of 10 cm/sec over a time interval of 8 hours (Schumacher, personal communication, 1976), we estimate that a significant methane source would have to be closer than 3 km to register in the time sequence. Inspection of Figure 6-11 reveals a rather "flat" horizontal methane distribution over a space scale of 3 km; hence little variation would be expected. Most of the variation may be attributed to imprecise depth position of the sampling bottle.

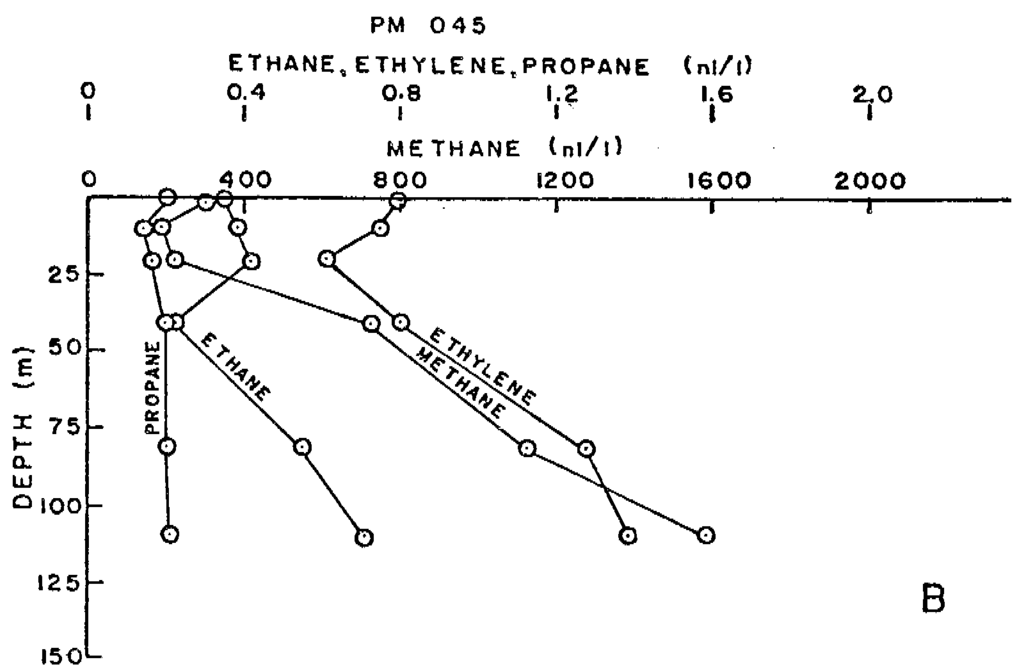
During the time study at station 62, the mean flow (35 hr filter) at 177 m was weak and variable. Early in the period at was toward the north at 10 cm/sec, diminishing to less than 5 cm/sec for the remainder of the period. Current direction was variable.

6.25 Typical Vertical Profiles

The vertical distributions of methane, ethane, ethylene and propane are shown for two stations in the Gulf of Alaska. Station 21 (Figure 6-18A) is located just south of Kayak Island, near the 100 fathom isobath. Methane, ethane, and ethylene concentrations increase monotonically with depth, suggesting a bottom source. There is an intermediate maximum in the concentration of methane and ethylene, which suggests lateral advection of hydrocarbon-rich water at 100 m or possible biological activity. The concentration of propane is uniform with depth, and appears not to be related to a bottom source.

Figure 6-18 Vertical distributions of methane, ethane, ethylene, and propane at two stations in the northeast Gulf of Alaska, PM 021(A) and PM 045(B). Observations were conducted during Oct-Nov. 1975.


PM 021
ETHANE, ETHYLENE, PROPANE (nl/l)
0 0.2 0.4 0.6 0.8 1.0
METHANE (nl/n)
0 100 200 300 400 500
ETHYLENE
ETHANE
METHANE
PROPANE
DEPTH (m)
25 50 75 100 125 150
A


PM 045
ETHANE, ETHYLENE, PROPANE (nl/l)
0 0.4 0.8 1.2 1.6 2.0
METHANE (nl/l)
0 400 800 1200 1600 2000
ETHYLENE
METHANE
ETHANE
PROPANE
DEPTH (m)
25 50 75 100 125 150
B

Station 45 is located near Hinchinbrook Entrance and is characterized by extremely high concentrations of methane. Surface values are near 300 mℓ/ℓ increasing to 1577 mℓ/ℓ at depth. Corresponding increases in ethylene and ethane are also observed as the bottom is approached, with propane and propylene remaining invariant with depth.

6.26 Kayak Island Seep Study

Relying on verbal information from the U.S. Geological Survey at Menlo Park concerning the locations of gas-charged sediments, approximately 12 hours of ship time were dedicated to an intensive study of the 10 fathom fault exposure south and west of Kayak Island (Carlson *et al.*, 1975). We had hoped to investigate the fault along the eastern boundary of the island, but shallow, uncharter waters prevented a study of most of the fault. Approximately 7 hours were used to run detailed transects for navigational purposes. At the same time, continuous fathometer readings were taken to delineate the fault and at the same time scan the waters for gas bubbles. None were conclusively observed.

Sampling was carried out along the fault every hour by lowering 2 Niskin bottles to within 2 and 4 m of the bottom. Sample bottle positioning was established by the PDR trace and a fix was taken at the moment the bottle was tripped. The results of the study are shown in Table 6-1 as time averages.

TABLE 6-1. Average concentration of LMWH taken 2 and 4 m from the sea floor at six stations along the 10 fathom fault line south of Kayak Island. The numbers in parentheses are standard deviations.

Distance	Methane	Ethane	Ethylene	Propane
		nℓ/ℓ		
2	442 ± (90)	0.4 ± (0.2)	1.0 ± (0.1)	0.2 ± (0.07)
4	442 ± (91)	0.4 ± (0.2)	1.0 ± (0.3)	0.2 ± (0.03)

No unusual concentrations of hydrocarbons were observed other than the normal variabilities in methane already discussed in section 6.24. Average and discrete methane, ethane, and propane concentrations were considered typical for the region near Kayak Island.

The failure to observe elevated concentrations of aliphatic hydrocarbons in the C_2-C_4 range indicates that gas seep activities were small or absent. Actual seep activity for the Kayak Island region has never been reported, only the presence of gas-charged sediments. Our investigation along the southern exposure of the fault would suggest that the gases in the underlying sediments are of normal biogenic origin, but analysis of dissolved gases in the surface sediments would be most helpful to confirm our suspicions.

Efforts are continuing with USGS to establish more precisely the location of the gas charged sediments, and seeps, near Kayak Island.

7. DISCUSSION

7.1 Sources of Hydrocarbons

Natural levels of LMWH in the marine environment occur via enzyme catalyzed biochemical reactions and the low temperature cracking of more complex organic molecules (Frank *et al.*, 1970). Small, but significant, amounts of hydrocarbons are also produced in the surface layers of the ocean, presumably in response to photosynthetic activity there. The nature and extent of these processes in the surface layers of the ocean are not well understood, but seasonal correlations with productivity are apparent (Lamontagne *et al.*, 1973a).

7.11 Benthic Hydrocarbon Indicators

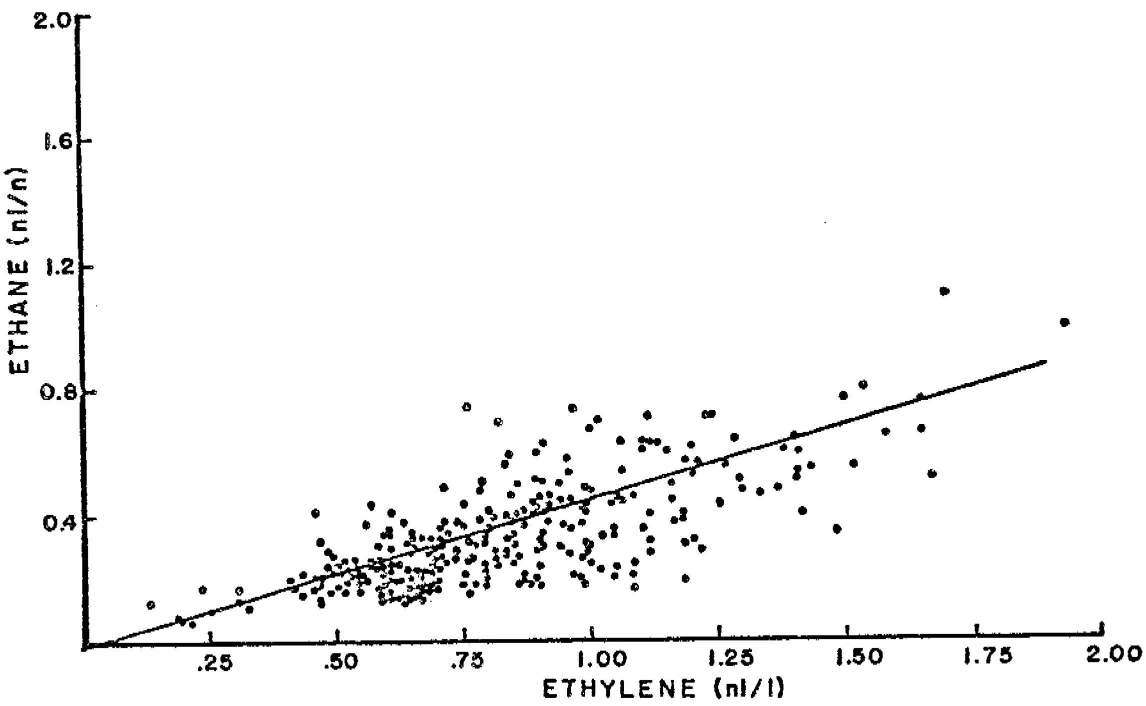
Methane is the dominant hydrocarbon observed in shelf waters; its concentration often exceeds other LMWH components by a factor of 100-1000. The production of methane is presumably through the biochemical reduction of CO_2 within anoxic sediments. CO_2 reduction is actually a complex series of microbial reactions, the sum of which results in the conversion of organic matter into carbon dioxide and methane (Claypool, 1974). This process is carried out by strict anaerobes and is indicative of organic-rich sediments. Coarse-grained sediments, including the sand fraction, are usually low in organic matter and consequently do not support vigorous methane production. Similarly, river deltas characterized by coarse-grained sediments of low organic carbon content would not represent environments conducive to biogenic methane formation.

Our measurements in the Bering Sea and the Gulf of Alaska support the aforementioned generalizations. Although the sedimentary environments in the Gulf of Alaska have not been fully investigated as to their potential for the formation of biogenic methane, the conclusions arrived at in the Bering Sea will probably carry forward.

Near-bottom sampling in the Bering Sea and the Gulf of Alaska revealed a positive correlation between the methane concentrations and ethane (cf. Figures 6-5 and 6-13). In the Bering Sea the data are contained in an envelope delineated by methane-ethane ratios of 40 to 300, whereas the same ratios in the Gulf of Alaska range from 300 to 2000. The major difference between the two environments is the relatively larger methane concentrations in the Gulf of Alaska. Assuming equal solubilities for methane and ethane, it would appear that gas seeps would have to be characterized by ethane concentrations in excess of 2% in the Bering Sea and 0.3% in the Gulf of Alaska before environmental distinctions could be made. It is not clear at this time why the differences in the ratios for the two areas should be so great.

A more informative ratio to consider might be the ethylene-ethane ratio. An example of the relationship between ethane and ethylene is shown in Figure 7-1. The slope of the least-squares line is a 0.45 (ethane vs ethylene) or 2.6 if ethylene is regressed against ethane. The standard error of the slope is ±0.03. Because this relationship shows a much stronger correlation ($r = 0.66$) than that observed in the plot of methane vs ethane, small variations in the ratio might be indicative of the hydrocarbon source. The ratio between ethane and ethylene should be extremely sensitive to petroleum or natural gas contribution because of the near zero levels of the olefins in natural gas.

Figure 7-1 The relationship between ethane and ethylene concentrations for all observations in the northeast Gulf of Alaska. The slope of the line is 0.45 ± 0.03 (r = 0.66).


2.0
1.6
1.2
0.8
0.4
ETHANE (nl/n)
.25
.50
.75
1.00
1.25
1.50
1.75
2.00
ETHYLENE (nl/l)

In both Bristol Bay and the Gulf of Alaska, concentrations of the C_3 and C_4 fractions were exceedingly low. Because of the pristine nature of the Alaskan shelf environment, these parameters may well show the largest perturbations in LMWH arising from accidental spillage. This is certainly the situation observed in the Gulf of Mexico, where 100-fold increases were observed in the concentrations of propane and butanes 100 km off the Mississippi River delta (Brooks and Sackett, 1973).

7.12 Atmospheric Exchange Processes

Volatile hydrocarbons produced in the marine environment or introduced through petroleum development will eventually escape to the atmosphere. An unknown fraction of the total will be microbially degraded by indigenous marine organisms. The relative magnitudes of the two processes are unknown, but atmospheric exchange should be the easier to estimate (Broecker and Peng, 1974). Microbial degradation will depend on many environmental parameters, including salinity, temperatures, nutrients, nature and surface area of particulate matter, bacterial flora, and possible microbial synergistic effects.

Our measurements conducted on the shelf region near Kayak Island reveal anomalous concentrations of methane in the surface waters (cf. Figure 6-10). In view of the intense mixing characterizing these waters, particularly in late fall, it is indeed surprising to observe these elevated amounts. Inspection of vertical profiles in the region suggest a source of methane at the surface, rather than at depth. Comparison of surface methane values with chlorophyll-A and primary productivity did not yield meaningful correlations (Jerry Larrance, personal communications). We assume that the observed concentrations are the result of biological activity, but the mechanisms or processes are unknown that produce methane in well-oxygenated waters (Claypool, 1974).

7.2 Hydrocarbon Tracers

One of the objectives of this hydrocarbon program was to establish the criteria under which LMWH might be useful as tracers of the toxic soluble fraction of crude oil. Although no major seep areas were identified conclusively, the high concentrations of methane generated on the shelf were used to characterize the space scales over which LMWH might be useful as tracers in the event a significant source were present.

To illustrate the potential, two vertical methane sections were constructed normal to the coast of Alaska. The first of these was constructed from observations made along the line of stations commencing in Resurrection Bay (cf. Figure 4-2), the latter originating in Yakutat Bay. The results are shown in Figures 7-2 and 7-3.

It is apparent that methane generated on the shelf of the upper slope has been transported off the shelf more than 100 km. Because the mean flow in the upper layers at this time of year is largely parallel to the isobaths or with a significant onshore component (Galt and Royer, 1976), we conclude that the distributions of methane shown in Figures 7-2 and 7-3 have arisen largely from lateral diffusion or from episodic offshore advective transport. At the time the eastern section was being occupied (Nov. 7-8, 1975), current measurements were being taken at station 62, located approximately 120 km to the west. Current measurements taken at 175 m and filtered for a 6-hour interval, show a weak flow to the west on 7 Nov., shifting to an onshore component of 10-15 cm/sec on 8 Nov. Concurrent observations taken at 104 m show a continuous NNW component at 15-20 cm/sec (Schumacher, personal communication). At this point, the actual source of the methane cannot be

Figure 7-2 The vertical distribution of methane along a north-south transect originating in Resurrection Bay (cf. Fig. 4-2). This line of stations (PM 001-PM 004) defines the western boundary of the survey region.

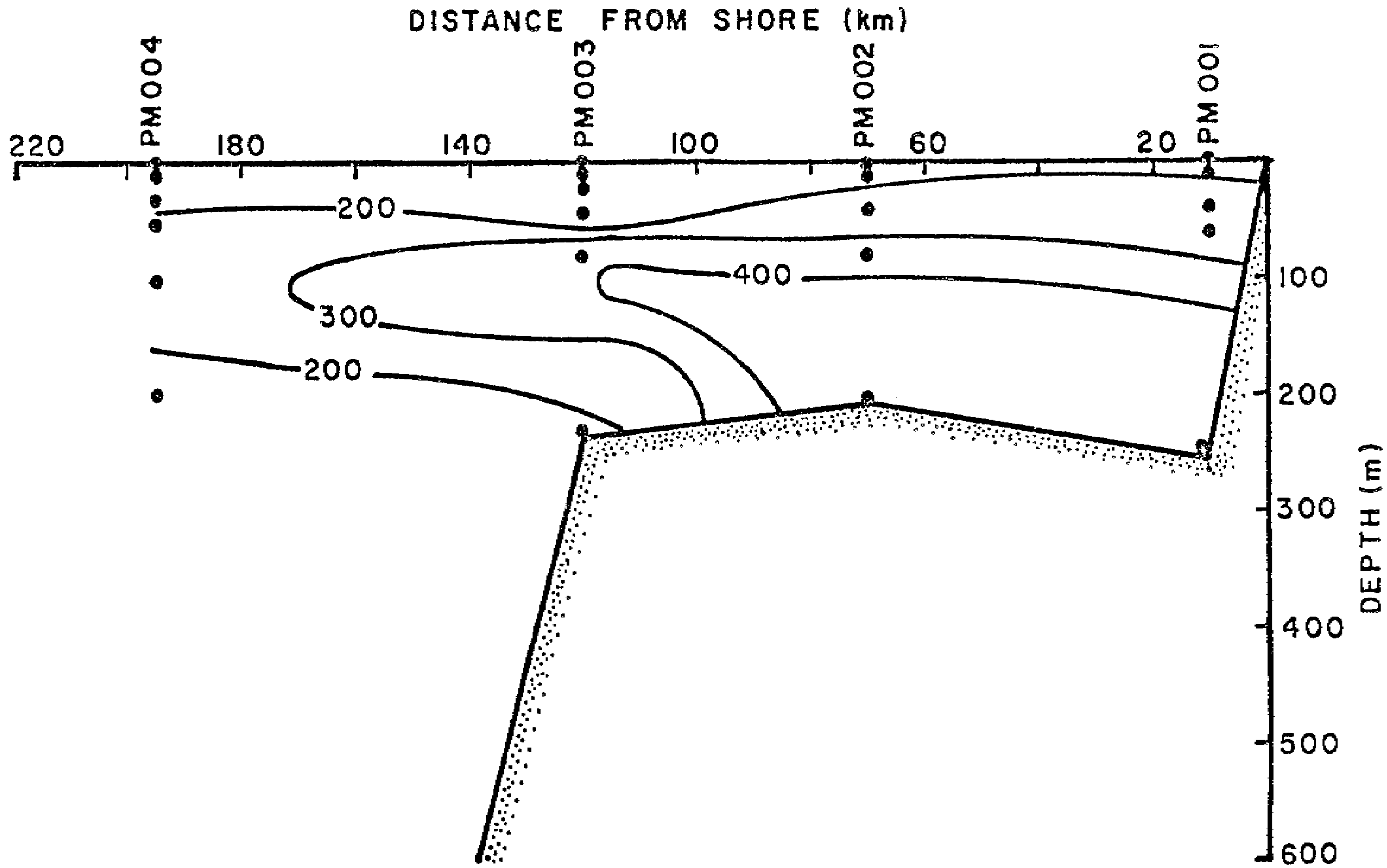
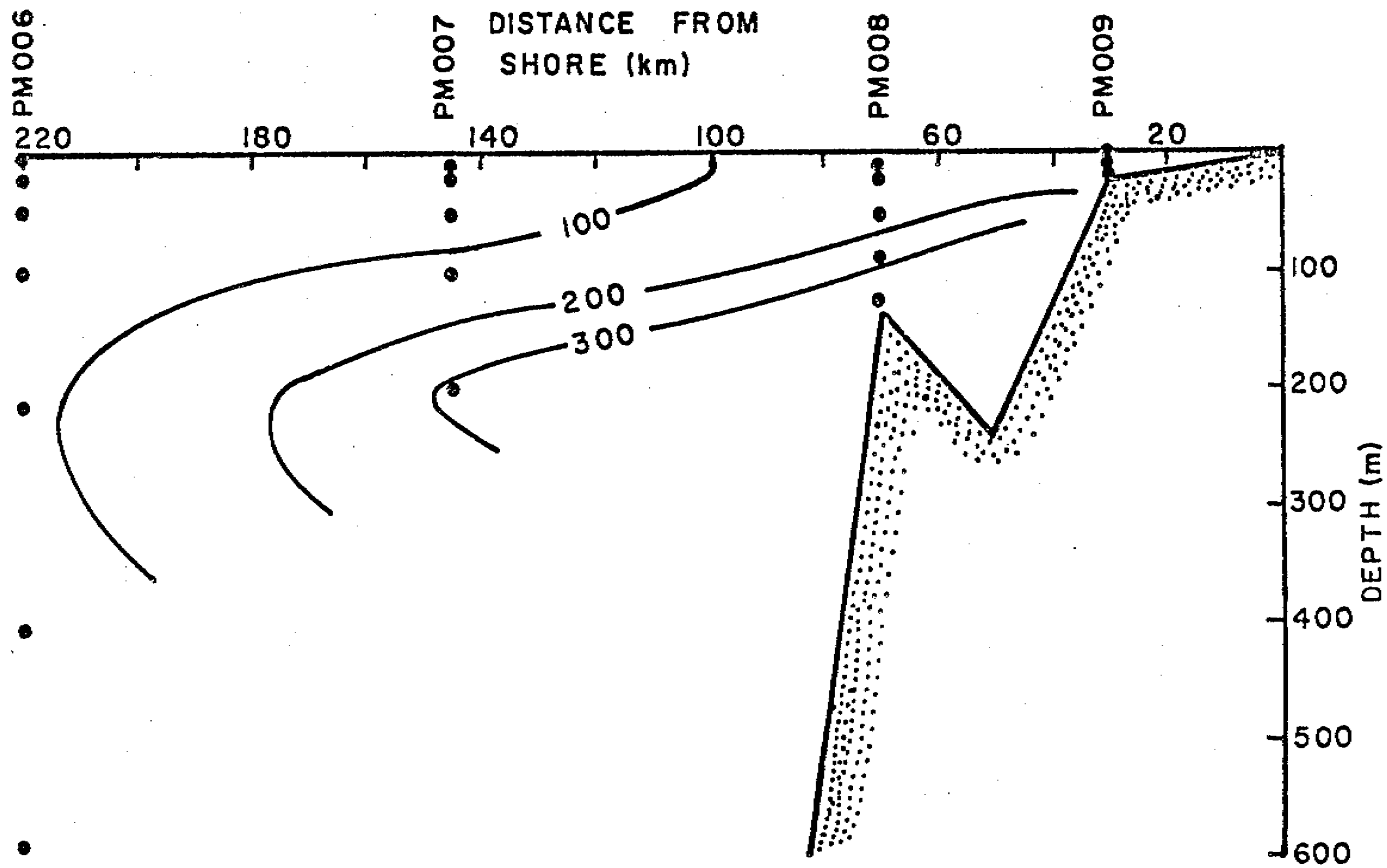

DISTANCE FROM SHORE (km)
PM004
PM003
PM002
PM001
220
180
140
100
60
20
200
300
400
200
100
200
300
400
500
600
DEPTH (m)

Figure 7-3 The vertical distribution of methane along a north-south transect originating in Yakutat Bay (cf. Fig. 4-2). This line of stations defines the eastern boundary of the survey region.


PM006
PM007
DISTANCE FROM
SHORE (km)
PM008
PM009
220
180
140
100
60
20
100
200
300
100
200
300
400
500
600
DEPTH (m)

stated unequivocally. But it seems clear, based on a rather cursory examination of current meter data, that the apparent penetration of methane offshore may have resulted from advective transport of waters from the east enriched in methane. The expected attrition of methane in direction of mean flow due to *in situ* consumption would be supplemented by lateral diffusion from the shelf region. Ignoring for the moment the mechanism by which methane was transported off the shelf, it was unusual and totally unexpected to find high concentrations of methane in well-oxygenated water at relatively great distances from known sources.

Because of these observations, it would appear that the near-bottom methane plume observed to the west of and underlying the Copper River plumé may be the result of circulation and not a benthic source (cf. Figure 6-11). Seasonal observations and methane profiles in the sediment should assist in the clarification of the issue.

8. CONCLUSIONS AND SUMMARY

The low molecular weight hydrocarbons, including methane, ethane, ethylene, propane, propylene, isobutane and n-butane were determined in Bristol Bay and the northeast Gulf of Alaska. The measurements were carried out in vertical profile in order that sources and sinks might be more clearly defined. This report indicates conditions as they existed during the fall of 1975.

In general, strong bottom sources of methane were identified in both the Bering Sea and the Gulf of Alaska. Just to the north of Unimak Pass in the region called the "Golden Triangle", methane concentrations exceeding 600 nℓ/ℓ were observed within 5 m of the bottom. Without confirming evidence on the distribution of methane in surface sediments, it is assumed that the methane arose from microbial degradation of organic matter with subsequent diffusion to the overlying water. Sediments characterized by lower concentrations of organic carbon generally reflected diminished near-bottom concentrations of methane.

In the Gulf of Alaska, extremely high concentrations of methane were observed south of Hinchinbrook Entrance; the origin is presently unknown. Concentrations of methane near the bottom were uniformly high (>200 nℓ/ℓ) over the entire shelf area and presumably reflect sedimentary carbon concentrations, although corroborating evidence is not at hand.

In the Bering Sea, surface methane values were generally in the range of 50-70 nℓ/ℓ, indicating a diminished bottom source and equilibration with the atmosphere. In contrast, the northeast Gulf of Alaska revealed high concentrations of methane in the surface waters, presumably due to an underlying benthic source. In the region surrounding Kayak Island, surface concentrations were greater than 250 nℓ/ℓ, indicating a sharp departure from equilibrium conditions. Again, the source of the methane is not readily apparent, but appears to be a surface generated phenomenon.

Time series measurements made in both the Bering Sea and the Gulf of Alaska suggest strong diurnal variations in the concentration of methane. The magnitude of the variations depends on short term current fluctuations and strong horizontal methane gradients. The periodicity of the fluctuations suggest tidal frequencies, but a complete analysis has not been made to date.

Correlations of ethane, ethylene, propane, and propylene have been made against methane. With the exception of propane and propylene, the others show a positive correlation with methane, suggesting a common origin. It is not known at this time whether the ethane and ethylene arose as the direct result of a biochemical process or as the result of low temperature cracking of organic matter. The former process seems more likely.

An analysis of ethane-methane ratios in the near-bottom waters of the Bering Sea and Gulf of Alaska suggests that ethane is never greater than 2% of the methane (Bering Sea) and is significantly lower than that in the Gulf of Alaska. There the ratio was highly variable, ranging from a low of 0.03% to a high of 0.2%. If we assume that natural gas contains more than 2% ethane by volume, we would conclude that no seep areas were unequivocally located in these surveys.

The differences observed in the ethane-methane ratio for the two environments may simply reflect a variable input of methane. As stated above, concentrations of methane in the Gulf of Alaska were significantly higher than those observed at comparable depths in the Bering Sea, but the concentrations of the C_2 and C_3 fractions are nearly the same in both areas. This may indicate that a saturation effect in which increased production of methane beyond a certain limit is not reflected in the concentrations of other hydrocarbon species. Additional studies are required to unravel the complexities of hydrocarbon production in marine sediments and in surface layers.

The concentrations of the C_2 and C_3 hydrocarbons were uniformly low in both the Bering Sea and the Gulf of Alaska. Concentrations generally averaged less than 1 nℓ/ℓ, with only a few notable exceptions. Ethylene and propylene concentrations were generally two-fold greater in concentration than their aliphatic homologs, and did not show the high surface concentrations that are normally indicative of photosynthetic activity.

Measurements for iso- and n-butanes were carried out, but the concentrations were uniformly low in both survey areas. Concentrations rarely exceeded 0.1 nℓ/ℓ and were usually near or below the detection limit of 0.03 nℓ/ℓ. Values greater than 0.1 nℓ/ℓ were generally attributed to contamination arising from the ship.

9. FUTURE RESEARCH ENDEAVORS

The present research activity centers largely on the seasonal and spatial variations in low molecular weight hydrocarbons with some attention being given to significant source regions. It is estimated that present field scheduling in the Bering Sea, Norton Sound, Chukchi Sea and the northeast Gulf of Alaska will, for the most part, satisfy our commitment to the establishment of baseline levels of LMWH in these areas. Since some of the geographical areas will be visited 3 times, others only once, seasonal information will be limited in scope in some areas, absent altogether in others. It would be desirable from a scientific point of view to continue our studies on the distributions, sources and ultimate fate of natural marine hydrocarbons, but we recognize that all of these goals may not be in the best interest or within the capabilities and jurisdiction of the OCS program. For these reasons, we feel that future research activities concerning LMWH should be redirected toward local source areas.

Future research activities should concentrate on known hydrocarbon inputs, whether they be natural or man-made. Included in these categories would be: a) anomalous hydrocarbon sources, b) natural gas and oil seeps, and c) existing petroleum platforms and producing wells. The aim of these studies would be to ascertain the sources and composition of the hydrocarbons, their input rates, and their usefulness as tracers of soluble hydrocarbons.

Detailed measurements of anomalous hydrocarbon sources, such as those revealed near Hinchinbrook Entrance and the Herendeen Bay in Bristol Bay, should be undertaken. Emphasis should be placed on near-bottom gradients and trajectories of the hydrocarbon plume. These efforts should be supported with detailed examination of the hydrocarbon content of the underlying sediments, particularly on surficial gradients from which flux calculations can be carried out. Attention should be given to the composition of the gases with particular regard for the C_2-C_5 fraction. If the concentration of methane is sufficiently high, it should be extracted and analyzed isotopically for $\delta^{13}C$ composition. The isotopic composition of the methane should reveal its primary source, whether it be principally biogenic in origin or the result of the percolation of natural gas from underlying reservoir rocks.

Similar detailed studies of natural gas and petroleum seep would also be indicated. Here, the Geological Survey should be consulted as to the seep location, input activity, and possible hydrocarbon composition. We are continuing our dialogue with the Conservation Division and the Gas and Oil Branch of the USGS as to the location of promising seep areas in the OCS.

In the event that a hydrocarbon source appears to be derived from petroleum or natural gas, a supplementary program should be initiated to sample the higher molecular weight fractions, as appropriate for the source. For example, in the case of a conventional petroleum seep, the C_6-C_{12} (gasoline and kerosene fraction) may be of interest as confirming evidence.

Lastly, we feel that the current production of petroleum in upper Cook Inlet should be examined in terms of LMWH. The results of Kinney *et al.* (1970) indicated elevated levels near the Forelands, which they ascribed to possible gas seeps. Observations will be conducted this spring in lower Cook Inlet and special attention will be given to the Forelands area. Based on these results, as well as geological data on the occurrence of seeps and sub-bottom geological structures, a study should be conducted into the sources of the hydrocarbons (i.e., platforms or natural seeps).

Sampling of localized sources of hydrocarbons should be carried out according to a high-density sampling grid. To be cost effective, sampling should be conducted with an *in situ* pumping system interfaced with a rapid gas extractor and chromatographic processor. Such a system has been built and will be field tested in May 1976.

Our findings in the Gulf of Alaska and the Bering Sea have shown interesting, but yet unexplained, relationships between methane, ethane, and ethylene. If the latter two components arise from the sediment, as we believe the bulk of the methane does, what are the processes that result in the formation of ethane and ethylene? Conceptually, we envision a biochemical origin for these gases, but the purely inorganic cracking of more complex organic molecules also may contribute significantly to their production. In the broadest context of the environmental assessment program, it seems that a knowledgeable understanding of the sources of natural hydrocarbons, the rates of input, and the ultimate fates are of paramount importance. Traditionally, it is the investigation of natural contaminants under natural environmental conditions that results in more reliable predictions concerning capacities, stress tolerances, and rates of recovery of a given system.

The production and escape of LMWH from sediments ought to be studied in the context of environmental and geochemical factors. Relationships between hydrocarbons and environmental characteristics, such as sediment type, size frequency, organic carbon content and origin, redox potential, sedimentation rates, pore water chemistry, and microbial populations, should be emphasized. Because the LMWH fraction is volatile, special coring apparatus must be constructed to eliminate exchange of gases with the atmosphere during sampling. As a first step, surficial hydrocarbon gradients and the loci of hydrocarbon production should be investigated in the upper 2 m of the sediment column. Depending on the outcome of these observations in promising localized areas, additional experiments should be developed to elucidate mechanisms and environmental control parameters.

10. SUMMARY OF 4TH QUARTER OPERATIONS

10.1 Task Objectives

In accordance with the guidelines set down by OCSEAP, two field programs have been conducted in the Bering Sea (RP-4-DI-75B-III) and in the northeast Gulf of Alaska (RP-4-DI-75C-I). The principal focus of these operations was to evaluate the spatial and temporal variations in the concentrations of the low molecular weight hydrocarbons (LMWH), methane, ethane, ethylene, propane, propylene, iso- and n-butane. Emphasis was also placed on natural sources of hydrocarbons, short term temporal variations, and potential seep areas. A detailed description of the program is presented in work unit #153/155.

10.2 Field Activities from January 1 - April 1, 1976

No field observations were conducted during the last quarter.

10.21 Laboratory Activities

During the winter months, work has continued on the development of rapid hydrocarbon analysis to augment our future field endeavors. Work has continued on the development of a vacuum gas extraction system to facilitate rapid sample processing. To supplement our ability to degas water samples rapidly, progress has been made in the optimization of the chromatography of LMWH. We have augmented the Poropak Q column (3/16" x 8') with an activated alumina column (3/16" x 2") impregnated with 1% silver nitrate by weight. This modification, together with temperature programming, has achieved sharper peaks and reduced retention times for all components. Chromatographic analysis has been reduced to under 7 minutes, compared to 15 minutes in the original procedure. Typical chromatographic responses are shown in Figure 5-2A,B of the annual report.

Plans are being initiated to develop, in cooperation with the biologists (J.D. Larrance and D.M. Damkaer), an *in situ* pumping system to which the vacuum extraction system will be interfaced. This will provide for increased mobility in the rapid and quantitative assessment of localized hydrocarbon inputs.

10.3 Laboratory Procedures

The procedure, originally developed by Swinnerton and Linnenbom (1967), has been modified slightly to facilitate field operations, including logistics. Samples are taken from either 5- or 10-l Niskin(R) samplers and stored temporarily in 1-l glass-stoppered bottles, to which has been added 100 mg of sodium azide to retard bacterial metabolism. Within two hours of sampling, hydrocarbons are quantitatively stripped from solution with ultra-pure helium and adsorbed on activated alumina at -196°C. After 12 minutes of stripping at a He flow rate of 120 ml/min, the cold trap is warmed to 90-100°C, and the released hydrocarbons chromatographed on a column of Poropak(R) Q (3/16" x 8'). Complete sample analysis of dissolved hydrocarbons including stripping, through C_4, requires less than 30 minutes.

10.4 Sampling Protocol

No field samples were taken during the reporting period.

10.5 Data Analysis

LMWH data collected during the aforementioned cruises were reduced and compiled according to the format designed by EDS/NODC. A copy of the format is shown in Appendix I.

Data for the cruises was submitted to Mr. Mauri Pelto, OCSEAP Data Manager, on February 12, 1976. Xerox copies of the data are included in Appendix II for your reference.

10.6 Results

The results of our field activities in late fall of 1975 are graphically displayed and discussed in sections 6 and 7 of the annual report and will not be reproduced here. Final data processing is continuing.

10.7 Financial Statement

The financial posture of the LMWH program, through April 1, 1976, is estimated on the following page. Because of salary overruns arising from unanticipated overtime commitments during scheduled cruises and the failure to carry forward FY 75 salary money, the anticipated salary shortages will be covered from existing supply and equipment funds. No hardship to the program is envisioned.

ESTIMATE OF FUNDS EXPENDED THROUGH 1 APRIL 1976

	Allocated	Expended to Date	Balance
Salaries and overhead	63.0 K	42.8 K (b)	20.2 K
Major equipment	26.5	17.5	9.0 (a)
Expendable supplies	17.5	8.4	9.1 (a)
Travel and per diem	2.0	3.0	4.0
Shipping	4.0	1.5	2.5
Publications	4.0	0.0	4.0
TOTAL	122.0 K	73.2 K	48.8 K

(a) reallocation necessary to pay future salaries

(b) 4K lost from FY 1975 (not carried over)

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Appendix 1 and 2 listed in the table of contents of this report are two sets of data not included here.

These data may be obtained by NAPIS # upon request from:

Jim Audet
NOAA/EDS/NODC
3300 Whitehaven St., N. W.
Washinton, D. C. 20235

NAPIS # 76-0630 (Discoverer cruise, October 21-November 5, 1975) -- includes 500 punched cards

NAPIS # 76-0631 (Discoverer cruise, September 21-October 3, 1975) -- includes 700 punched cards

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