ROUTING SLIP INITIAL

ECOLOGIST ☐ _____

CHEMIST ☑ _____

TECHNICIAN ☐ _____

_____

_____

_____

ACTION REQUIRED:

Review and Brief me on this by 1 Feb

Ronald H. Levine, M.D., M.P.H.
STATE HEALTH DIRECTOR

DIVISION OF HEALTH SERVICES
STATE LABORATORY OF PUBLIC HEALTH
306 N. Wilmington St.
P.O. Box 28047
Raleigh, N.C. 27611-8047

CAMP LEJEUNE/WTR QC BACT LAB
BASE MAINT DEPT/BLDG 65
CAMP LEJEUNE NC 28542

MEMORANDUM

TO: Laboratories Certified for the Analysis of Drinking Water

FROM: E. D. Beesley EDB
Ellen Neill EN

DATE: December 19, 1982

A new 5 digit identification number has been assigned to your laboratory. It has been designed to indicate the state in which the laboratory is located, the laboratory type, and serial number.

☐☐ ☐ ☐☐
State Type Serial No.

The number signifying North Carolina is 37.

Laboratory Type will include:

5 - State, County Health Department
6 - Municipal, County or District Water Supply
7 - Commercial
8 - Industrial, Federal, University, Miscellaneous

Your number is 3 7 8 0 7

Please include this number on all reports submitted to Water Supply Branch for compliance purposes.

EDB;EN/leh

NATURAL RESOURCES AND ENVIRONMENTAL AFFAIRS DIVISION
Marine Corps Base
Camp Lejeune, North Carolina 28542

10-28-82
Date

From:
To: Donny DS
Subj:

I told Col. Marshall + LtCol Fitzgerald about the certification,

Julian

Betsy - Post The Certification and file the report.

Ronald H. Levine, M.D., M.P.H.
STATE HEALTH DIRECTOR

DIVISION OF HEALTH SERVICES
STATE LABORATORY OF PUBLIC HEALTH
306 N. Wilmington St.
P.O. Box 28047
Raleigh, N.C. 27611-8047

October 18, 1982

Commanding General
U. S. Marine Corps Base
Camp Lejeune, North Carolina 28542

Dear Sir:

The findings of the on-site evaluation on September 28, 1982 indicates that your laboratory has met the minimum requirements for certification as specified in North Carolina Drinking Water Regulations (10NCAC 9D .0301 - .0330). We therfore grant Interim Certification to your laboratory for total coliform analysis on public water supplies.

If you have any questions or if we may be of further assistance in this matter, please let us know.

Sincerely,

E. D. Beesley

E. D. Beesley
Laboratory Certification Evaluator

EDB/leh
Enclosure

REPORT OF AN ON-SITE EVALUATION

USMCB-CAMP LEJEUNE

QUALITY CONTROL LABORATORY

BACTERIOLOGY LABORATORY

ENVIRONMENTAL SECTION, NATURAL RESOURCES & ENVIRONMENTAL AFFAIRS BRANCH

BASE MAINTENANCE DIVISION, BUILDING 65

CAMP LEJEUNE, NORTH CAROLINA 28542

SEPTEMBER 28, 1982

BY:

E. D. BEESLEY

LABORATORY CERTIFICATION EVALUATOR

ENVIRONMENTAL SCIENCES BRANCH

LABORATORY SECTION

NORTH CAROLINA DIVISION OF HEALTH SERVICES

NORTH WILMINGTON STREET

RALEIGH, NORTH CAROLINA 27611

REPORT OF AN ON-SITE EVALUATION

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ENVIRONMENTAL SECTION, NATURAL RESOURCES & ENVIRONMENTAL AFFAIRS BRANCH

BASE MAINTENANCE DIVISION, BUILDING 66

CAMP LEJEUNE, NORTH CAROLINA 28542

SEPTEMBER 28, 1982

BY:

E. D. BEFSLEY

LABORATORY CERTIFICATION EVALUATOR

ENVIRONMENTAL SCIENCES BRANCH

LABORATORY SECTION

NORTH CAROLINA DIVISION OF HEALTH SERVICES

NORTH WILMINGTON STREET

RALEIGH, NORTH CAROLINA 27611

I. INTRODUCTION

The equipment and procedures employed in the bacteriological analyses of water by this laboratory conformed with the provisions of the North Carolina Safe Drinking Water Regulations, except for the items indicated.

II. DEVIATIONS AND RECOMMENDATIONS

No deviations

III. REMARKS

The NBS traceable thermometer should be replaced with one calibrated in 0.1 C divisions.

A maximum registering thermometer must be obtained for checking autoclave function.

IV. LIST OF PERSONNEL

NAME	POSITION	TEST NORMALLY PERFORMED
Elizabeth A. Betz	Supervisory Chemist	MF & MPN
Hoy Burns	Technician/Analyst	MF & MPN
Bob Lachapelle	Technician/Analyst	MF
Gaines Honeycutt	Technician/Analyst	MF
Gerald Monahan	Technician/Analyst	MF

V. CONCLUSION

The procedures and equipment in use at the time of this survey were in general compliance with the provisions of the North Carolina Drinking Water Regulations (10NCAC 9D .0301 - .0330). We recommend that the analytical data be accepted for MF and MPN Coliform analysis of drinking waters under the North Carolina Safe Drinking Water Act.

USMCB-Camp Lejeune
Quality Control Lab.
Camp Lejeune, N. C.
September 28, 1982
Page 2

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STATE LABORATORY OF PUBLIC HEALTH

DIVISION OF HEALTH SERVICES

NORTH CAROLINA DEPARTMENT OF HUMAN RESOURCES

P. O. BOX 28047, 306 NORTH WILMINGTON STREET, RALEIGH, N. C. 27611

FORMS FOR ON-SITE EVALUATION OF LABORATORIES INVOLVED IN ANALYSIS OF PUBLIC WATER SUPPLIES-MICROBIOLOGY

LABORATORY: Quality Control Laboratory, Environmental Section
Natural Resources & Environmental Affairs Branch
Base Maintenance Division

STREET: MCB Camp Lejeune, Bldg 65

CITY: Camp Lejeune STATE: North Carolina 28542

TELEPHONE NUMBER: (919) 451-5977

SURVEY BY: E. D. Beesley

AFFILIATION: North Carolina Division of Health Services

DATE: September 28, 1982

CODES FOR MARKING ON-SITE EVALUATION FORMS:

S - Satisfactory

X - Unsatisfactory

NA - Not Applicable

DHS FORM 2907 Revised (8/80)
Laboratory

PERSONNEL

POSITION/ TITLE	NAME	ACADEMIC TRAINING				TESTING METHOD(S)	EXPERIENCE (YEARS/AREA)
		HS	BA/BS	MA/MS	PH.D		
LABORATORY DIRECTOR Supervisory Chemist	Elizabeth A. Betz	X	BS Chem			MF & MPN	3 years
TECHNICIAN/ ANALYST	Hoy Burns	X	1 year*			MF & MPN	6 years
	Bob Lachapelle	X	1 year**			MF	1 year
	Gaines Honeycutt	X	AAS***			MF	1 year
	Gerald Monahan	X	BS Env.	Studies		MF	1 year

* 14 months Navy Clinical Lab School. Reg. Med. Tech.
** 14 months " " " " Lab supervisor 4 years
*** 6 years NC Dept. of Natural Resources

LABORATORY FACILITIES

Space in laboratory and preparation room is adequate for needs during peak work periods (200 ft^2 and 6 linear ft. of usable bench space per analyst).

Facilities are clean, with adequate lighting (100 ft-candles) and air conditioning.

Satisfactory

LABORATORY EQUIPMENT, SUPPLIES, AND MATERIALS

1. *pH Meter*

Manufacturer Corning Orion Model M10 701

Clean, calibrated to 0.1 pH units each use period; record maintained..... S

Aliquot of standard pH 7.0 buffer used only once..... S

2. *Balance-Top Loader or Pan*

Manufacturer Ohaus Model Harvard Trip

Clean. Detects a 50-mg weight accurately (for a general media preparation of ≥ 2-g quantities)..... S

Good quality weights in clean condition..... S

3. *Thermometers*

Rec. 0.1°C Trac. Therm., Max Reg.

Glass thermometers calibrated annually against a certified thermometer or one of equivalent accuracy; metal thermometers checked quarterly..... S

Legible graduations..... S

No separation in liquid column..... S

4. *Incubator or Incubator Room*

Manufacturer Precision Model M2

Sufficient size for daily work load..... S

Thermometer graduated in 0.5°C increments with bulb immersed in liquid and located on shelves in use..... S

Uniform temperature maintained on shelves in all areas used (35.0° ± 0.5°C) S

Temperature recorded daily or recording thermometer sensitive to ± 0.5°C... S

5. *Autoclave*

Manufacturer Market Forge Model Sterilmatic

Reaches sterilization temperature (121°C), maintains 121°C during sterilization cycle, and requires no more than 45 min for a complete cycle.. S

Pressure and temperature gauges on exhaust side and an operating safety valve..... S

No air bubbles produced in fermentation vials during depressurization..... S

Record maintained on time and temperature for each sterilization cycle..... S

Max.Reg. 121.3 (NCDHS) S

6. *Hot-Air Oven*

Manufacturer NA Model _____

Operates at a minimum of 170°C..... _____

Thermometer inserted or oven equipped with temperature-recording thermometer device..... _____

Time and temperature record maintained for each sterilization cycle..... _____

Thermometer bulb in sand (*optional*)

7. *Refrigerator*

Temperature maintained at 1° to ~~4.4°C (34° to 40°F).~~ 5.0°C..... S

8. *Inoculation Equipment*

Sterilized loops of at least 3-mm diameter, 22 to 24 gauge Nichrome, Chromel, or platinum-iridium wire..... S

Disposable, dry heat-sterilized, hardwood applicator sticks or presterilized loops..... NA

9. *Optical Equipment*

Low power magnification device (preferably binocular microscope with 10 to 15X) with fluorescent light source for counting MF colonies..... S

Colonies counted with a mechanical hand tally (*optional*)

10. *Membrane Filtration Equipment*

Manufacturer Millipore Model _____

Made of stainless steel, glass, or autoclavable plastic..... S

Nonleaking and uncorroded..... S

11. *Membrane Filters and Pads*

Manufacturer Millipore Type HAWG

Filters recommended by manufacturer for water analyses..... S

Filters and pads presterilized or autoclavable..... S

Lot numbers and dates of receipt of membrane filters recorded (*optional*)

12. *Glass, Plastic, and Metal Utensils for Media Preparation*

SP Automatic Washer Det.
Washing process provides glassware free of toxic residue as demonstrated by the inhibitory residue test and results recorded..... S

Glass items of borosilicate, free of chips and cracks..... S

Utensils clean and free from foreign residues or dried medium..... S

Plastic items clear with visible graduations..... S

13. *Sample Bottles*

Wide-mouth hard glass bottles; stoppered or plastic screw-capped; capacity at least 120 ml..... S

Glass-stoppered bottles with tops covered with aluminum foil or kraft paper..... NA

Screw-caps have leakproof nontoxic liners that can withstand repeated sterilization (30 min at 121°C)..... S

Sterility of each batch of sample bottles checked and results recorded..... S

14. *Pipets*

Brand Falcon Type TD

Sterile; glass or plastic; with a 2.5 percent tolerance..... S

Tips unbroken; graduations distinctly marked..... S

15. *Pipet Containers*

Aluminum or stainless steel..... NA

Pipets wrapped in ~~quality kraft paper (char-resistant)~~..... S

Open packs of disposable sterile pipets resealed between uses..... S

16. *Culture Dishes*

Brand Pyrex / Millipore Type 100 X 15 / 49 X 9

Sterile plastic or glass..... S

Open packs of disposable sterile plastic dishes resealed between uses..... S

Dishes are in containers of aluminum or stainless-steel with covers or are wrapped with heavy aluminum foil or char-resistant paper..... S

17. *Culture Tubes and Closures*

Sufficient size to contain medium and sample without danger of spillage.... S

Metal or plastic caps; plastic plugs..... S

Borosilicate glass or other corrosion-resistant glass..... S

18. *Maintenance*

Service contracts or approved internal protocol maintained on balance, autoclave, water still, etc.; service records entered in a log book..... S

GENERAL LABORATORY PRACTICES

1. *Sterilization Procedures*

Timing for sterilization begins when autoclave reaches 121°C..... S

Tube broth media and reagents sterilized at 121°C 12 to 15 min..... S

Tubes and flasks packed loosely in baskets or racks for uniform heating and cooling..... S

Total exposure of MPN media to heat not over 45 min..... S

Dilution water blanks autoclaved at 121°C for 30 min..... S

MF presterilized or autoclaved at 121°C for 10 min fast exhaust..... S

MF assemblies and empty sample bottles sterilized at 121°C for 30 min..... S

MF assemblies sterilized between sample filtration series..... S

Rinse water volumes of 500 to 1,000 ml sterilized at 121°C for 45 min..... S

Wire loops, needles, and forceps sterilized..... S

Individual glassware items autoclaved at 121°C for 30 min..... S

Individual dry glassware items sterilized 2 hours at 170°C (dry heat)..... NA

Pipets, culture dishes, and applicator sticks in boxes sterilized at 170°C for 2 hours..... NA

MPN media removed and cooled as soon as possible after sterilization and stored in cool dark place (*optional*)

UV light or boiling water for at least 2 min may be used on membrane filter assemblies to reduce bacterial carry-over between each filtration (*optional*)

Heat-sensitive tapes and/or strips/ampoules used during sterilization (*optional*)

2. *Laboratory Pure Water*

Only laboratory pure water, used in preparing media, reagents, rinse water, and dilution water..... S

Laboratory pure water not in contact with heavy metals..... S

Source: Laboratory-prepared ✓ Purchased _____

If laboratory-prepared:

Still Manufacturer Corning Megapure 6L

Deionizer Manufacturer Corning High Cap

Record of recharge frequency ✓

Production rate and quality adequate for laboratory needs..... S

Inspected, repaired, cleaned by service contract or in-house service..... S

a. Chemical Quality Control

Record of satisfactory annual analyses for trace metals

A single metal not greater than 0.05 mg/l..... ____

Total metals: equal to or less than 1.0 mg/l..... ____

Testing laboratory _____ Date _____

Record of monthly analyses of laboratory pure water

Conductance: >0.2 megohm resistivity or <5.0 microhmos/cm..... S

pH: 5.5 - 7.5..... S

Standard plate count: <10,000/ml..... S

Free chlorine residual: 0.0..... S
<0.1

b. Microbiological Quality Control

Test for bactericidal properties of distilled water (0.8 - 3.0) performed at least annually..... —

Testing laboratory _____ Date _____ Ratio _____

3. *Rinse and Dilution Water*

Stock buffer solution prepared according to "Standard Methods", 15th 13th edition..... S

Stock buffer solution adjusted to pH 7.2..... S

Stock buffer autoclaved at 121°C, stored at 1° to ~~4.4~~ 5.0°C (34° to 40°F) or filter sterilized..... S

Stock buffer labeled and dated..... S

Stock potassium phosphate buffer solution (1.25 ml) added per liter distilled water for rinse and dilution water..... S

Final pH 7.2 ± 0.1..... S

4. *Media*

Dehydrated media bottles kept tightly closed and protected from dust and excessive humidity in storage areas..... S

Dehydrated media not used if discolored or caked..... S

Laboratory pure water used in media preparation..... S

Media completely dissolved before dispensing to culture tubes or bottles... S

MPN tube media with loose-fitting caps used in less than 1 week..... NA

Tube media in screw-capped tubes held no longer than 3 months..... S

Media stored at low temperatures are incubated overnight prior to use and tubes with air bubbles discarded..... S

Media protected from sunlight..... S

MF media stored in refrigerator; broth media used within 96 hours, agar within two weeks if prepared in tight-fitting dishes..... S

Ampouled media stored at 1° to ~~4.4~~ 5.0°C and time limited to manufacturer's expiration date..... S

5. *Quality Control of Media and Reagents*

Satisfactory records containing complete quality control checks on media available for inspection..... S

Laboratory chemicals of Analytical Reagent Grade..... S

Dyes certified for bacteriological use..... NA

pH checked and recorded on each batch of medium after preparation and after sterilization..... S

Causes for deviations beyond ± 0.2 pH units specified..... S

Media ordered on a basis of 12-month need; purchases in ¼ lb. quantities, except those used in large amounts (*optional*)

Bottles dated on receipt and when opened (*optional*)

Opened bottles of routinely used media discarded within 6 months (if stored in desiccator storage may be extended) (*optional*)

Shelf life of unopened bottles not in excess of 2 years (*optional*)

New lots of media quality tested against satisfactory lot using natural water samples (*optional*)

6. *Lauryl Tryptose Broth*

Manufacturer Difco Lot No. 703562 2/87

Single strength composition, 35.6g per liter pure water..... S

Single strength pH 6.8 ± 0.2; double strength pH 6.7 ± 0.2..... S

Not less than 10 ml per tube..... S

Media made to result in single strength after addition of sample portions..... S

7. *Brilliant Green Lactose Bile Broth*

Manufacturer Difco Lot No. 686824 10/86

Medium composition 40g per liter pure water..... S

Final pH 7.2 ± 0.2..... S

8. *M-Endo Media*

Manufacturer Difco Lot No. 702638

Medium composition 48.0g per liter pure water; optionally 15g agar added/l..... S

Reconstituted in laboratory pure water containing 2 percent ethanol (not denatured)..... S

Final pH 7.2 ± 0.2..... S

Medium held in boiling water bath until completely dissolved..... S

9. *Standard Plate Count Agar*

Manufacturer Difco Lot No. 677117

Correct composition, sterile and pH 7.0 ± 0.2..... S

Sterile medium not remelted a second time after sterilization..... S

Culture dishes incubated 48 hours at 35° ± 0.5°C..... S

No more than 1.0 ml or less than 0.1 ml sample plated (sample or dilution). S

Liquefied agar, 10 ml or more; medium temperature between 44° to 46°C..... S

Melted medium stored no longer than 3 hours before use..... S

Only plates with between 30 to 300 colonies counted; when 1 ml of undiluted sample is plated, colony density may be less than 30..... S

Only two significant figures recorded and calculated as standard plate count/ml..... S

10. *Levine's Eosin Methylent Blue Agar (EMB)*

Manufacturer Difco Lot No. 70/060

Medium composition 37.5g per liter..... S

Final pH 7.1 ± 0.2..... S

METHODOLOGY

Methodology specified in "Standard Methods" ~~13th~~ 14th, 15th edition, or EPA manual..... S

M-Endo broth, M-Endo agar, or Les Endo agar used in a single step procedure..... S

In two-step Les M-Endo procedure, MF incubated on lauryl tryptose broth saturated absorbent pad for 1.5 to 2 hours at 3.5° ± 0.5°C; then on M-Endo broth at Les Endo agar for 20 to 22 hours at 35° ± 0.5°C..... NA

1. *Total Coliform Membrane Filter Procedure*

Samples containing excessive bacterial populations (greater than 200), confluency, or turbidity retested by the MPN procedure..... S

Filtration assembly sterile at start of each series..... S

Absorbent pads saturated with medium, excess discarded; or 4.0 ml of agar medium can be used per culture dish instead of a pad..... S

Sample shaken vigorously immediately before test..... S

Test sample portions measured and not less than 100 ml..... S

Funnel rinsed at least twice with 20- to 30-ml portions of sterile buffered water..... S

MF removed with sterile forceps, grasping outside effective filtering area..... S

MF rolled onto medium pad or agar so air bubbles are not trapped..... S

A start and finish MF control test (rinse water, medium and supplies) run with each filtration series and results recorded..... S

When controls indicate contamination occurred, all data on affected samples rejected and resampling requested..... S

a. Incubation of Membrane Filter Cultures

Total incubation time 22 to 24 hours at 35° ± 0.5°C..... S

Incubated in tight-fitting culture dishes or loose-fitting dishes incubated in high relative humidity chambers..... S

b. Membrane Filter Colony Counting

Samples repeated when coliforms are "TNTC" or colony growth is confluent, possibly obscuring coliform development and/or detection..... S

Total coliform count calculated in density per 100 ml..... S

Samples containing five or more coliforms per 100 ml are resampled and tested..... S

Low power magnification device with fluorescent light positioned for maximum sheen visibility..... S

c. Verification of Total Coliform Colonies

All typical coliform (sheen) colonies or at least five randomly selected sheen colonies from each positive sample verified in lauryl tryptose broth and BGLB..... S

Counts adjusted based on verification..... S

All atypical coliform (borderline sheen) colonies or at least five randomly-selected colonies verified in LTB and BGLB..... S

Counts adjusted based on verification..... S

Sheen colonies in mixed confluent growth reported and verified (*optional*)

d. MF Field Equipment

Manufacturer NA Model _____

Only standard laboratory MF procedures adapted to field application.... _____

2. *Total Coliform Most Probable Number Procedure*

a. Presumptive Test

Five standard portions, either 10 or 100 ml..... S

Sample shaken vigorously immediately before test..... S

Tubes incubated at 35° ± 0.5°C for 24 ± 2 hours..... S

Examined for gas (any gas bubble indicates positive test)..... S

Tubes that are gas-positive within 24 hours submitted promptly to confirm test..... S

Negative tubes returned to incubator and examined for gas within 48 ± 3 hours; positives submitted to confirm test..... S

Public water supply samples with heavy growth and no gas production confirmed for presence of supressed coliforms..... S

Adjusted count reported based upon confirmation..... S

Adequate test labeling and tube dilution coding (*optional*)

b. Confirmed Test

Presumptive positive tube gently shaken or mixed by rotating..... S

One loopful or one dip of applicator transferred from presumptive tube to BGLB..... S

Incubated at 35°C ± 0.5°; checked within 24 hours ± 2 hours for gas production..... S

Positive confirmed tube results recorded; negative tubes reincubated and read within 48 ± 3 hours..... S

Unsatisfactory sample defined as three or more positive confirmed tubes..... S

Confirmation procedure carried out every 3 months on one sample from each problem water supply..... S

c. Completed Test

Applied to 10 percent of all positive samples each quarter..... S

Applied to all positive confirmed tubes in each test completed..... S

Positive confirmed tubes streaked on EMB plates for colony isolation.... S

Plates adequately streaked to obtain discrete colonies..... S

Incubated at 35° ± 0.5°C for 24 ± 2 hours..... S

Typical nucleated colonies, with or without sheen on EMB plates selected for completed test identification..... S

If typical colonies absent, atypical colonies selected for completed test identification..... S

If no colonies or only colorless colonies appear, confirmed test for that particular tube considered negative..... S

An isolated typical colony or two atypical colonies transferred to lauryl tryptose broth..... S

Incubated at 35° ± 0.5°C; checked for gas within 48 ± 3 hours..... S

Cultures producing gas in lauryl tryptose broth within 48 ± 3 hours are considered coliforms..... S

3. *Analytical Quality Control*

A record of analytical quality control tests available for review..... S

Duplicate analyses

Duplicate analyses run on positive polluted samples not to exceed 10 percent but a minimum of one per month *(optional)*

Positive Control Samples

One positive control sample (polluted water) run each month *(optional)*

Colony Counting (If more than one Analyst in Laboratory)

Two or more analysts count sheen colonies; all colonies are verified analysts' counts compared to verified counts; procedure is carried out at least once per month *(optional)*

Check Analyses by State Laboratories

A minimum of samples proportional to the local laboratory work load processed by State Laboratory (see criteria for recommendations) *(optional)*

5. *Sample Receipt in Laboratory*

Sample logged in when received in laboratory, including date and time of arrival and analysis..... S

Chain-of-custody procedures required by State regulations followed..... S

DATA REPORTING

Sample information and laboratory data fully recorded..... S

Direct MF counts and/or confirmed MPN results reported promptly..... S

After MF verification and/or MPN completion, adjusted counts reported..... S

One copy of report form retained in laboratory or by State program for 3 years..... S

Test results assembled and available for inspection *(optional)*

ACTION RESPONSE TO LABORATORY RESULTS

Unsatisfactory test results given action response and resampled as defined in National Interim Primary Drinking Water Regulations..... S

State and responsible local authority notified within 48 hours after check samples confirm coliform occurrence..... S

All data reported to State and local authorities within 40 days..... S

QUALITY CONTROL PRACTICES

An outline of the quality control efforts of the laboratory available for review..... S

SAMPLE COLLECTION, HANDLING, AND PRESERVATION

Representative samples of potable water distribution system..... S

Minimal sampling frequency as specified in the National Interim Primary Drinking Water Regulations..... S

Sample collector trained and approved as required by State regulatory authority or its delegated representative..... S

1. *Sample Bottles*

Sodium thiosulfate, (10 mg per 100 ml.) added to sample bottle before sterilization..... S

Ample air space remains after sample collected to allow for adequate mixing..... S

2. *Sampling*

Sample collected after maintaining a steady flow for 2 to 3 min to clear service line..... S

Tap free of aerator, strainer, hose attachment, water purification, or other devices..... S

Samples refrigerated when possible during transit and storage periods in the laboratory (*optional*)

3. *Sample Identification*

Sample identified immediately after collection..... S

Identification includes, water source, location, time and date of collection, and collector's name; insufficiently identified samples discarded..... S

Chlorine residual where applicable..... S

4. *Sample Transit Time*

Transit time for potable water samples sent by mail or commercial transportation, not in excess of 30 hours..... NA

No sample processed after 48-hour transit/storage..... NA

Samples delivered to laboratory by collectors examined the day of collection..... S

Data marked as questionable on samples analyzed after 30 hours..... NA

Ronald H. Levine, M.D., M.P.H.
STATE HEALTH DIRECTOR

DIVISION OF HEALTH SERVICES
STATE LABORATORY OF PUBLIC HEALTH
306 N. Wilmington St.
P.O. Box 28047
Raleigh, N.C. 27611-8047

October 18, 1982

Commanding General
U. S. Marine Corps Base
Camp Lejeune, North Carolina 28542

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The findings of the on-site evaluation on September 28, 1982 indicates that your laboratory has met the minimum requirements for certification as specified in North Carolina Drinking Water Regulations (10NCAC 9D .0301 - .0330). We therfore grant Interim Certification to your laboratory for total coliform analysis on public water supplies.

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Sincerely,

E. D. Beesley

E. D. Beesley
Laboratory Certification Evaluator

EDB/leh
Enclosure

North Carolina
Department of Human Resources
Division of Health Services

Interim Certification

for the analysis of drinking water

has been granted to

CAMP LEJEUNE QUALITY CONTROL LABORATORY

for the following parameters

Coliform Bacteria - by Membrane Filter Procedure
Coliform Bacteria - by Most Probable Number Procedure

September 1984
Expiration Date

100
Laboratory Number

Donald A. Levine
State Health Director

Mildred Kerbaugh
Chief, State Laboratory of Public Health

E. D. Beasley
Certification Officer

REPORT OF AN ON-SITE EVALUATION

USMCB-CAMP LEJEUNE

QUALITY CONTROL LABORATORY

BACTERIOLOGY LABORATORY

ENVIRONMENTAL SECTION, NATURAL RESOURCES & ENVIRONMENTAL AFFAIRS BRANCH

BASE MAINTENANCE DIVISION, BUILDING 65

CAMP LEJEUNE, NORTH CAROLINA 28542

SEPTEMBER 28, 1982

BY:

E. D. BEESLEY

LABORATORY CERTIFICATION EVALUATOR

ENVIRONMENTAL SCIENCES BRANCH

LABORATORY SECTION

NORTH CAROLINA DIVISION OF HEALTH SERVICES

NORTH WILMINGTON STREET

RALEIGH, NORTH CAROLINA 27611

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STATE LABORATORY OF PUBLIC HEALTH

DIVISION OF HEALTH SERVICES

NORTH CAROLINA DEPARTMENT OF HUMAN RESOURCES

P. O. BOX 28047, 306 NORTH WILMINGTON STREET, RALEIGH, N. C. 27611

FORMS FOR ON-SITE EVALUATION OF LABORATORIES INVOLVED IN ANALYSIS OF PUBLIC WATER SUPPLIES-MICROBIOLOGY

LABORATORY: Quality Control Laboratory, Environmental Section
Natural Resources & Environmental Affairs Branch
Base Maintenance Division

STREET: MCB Camp Lejeune, Bldg 65

CITY: Camp Lejeune STATE: North Carolina 28542

TELEPHONE NUMBER: (919) 451-5977

SURVEY BY: E. D. Beesley

AFFILIATION: North Carolina Division of Health Services

DATE: September 28, 1982

CODES FOR MARKING ON-SITE EVALUATION FORMS:

S - Satisfactory

X - Unsatisfactory

NA - Not Applicable

DHS FORM 2907 Revised (8/80)
Laboratory

PERSONNEL

POSITION/ TITLE	NAME	ACADEMIC TRAINING				TESTING METHOD(S)	EXPERIENCE (YEARS/AREA)
		HS	BA/BS	MA/MS	PH.D		
LABORATORY DIRECTOR Supervisory Chemist	Elizabeth A. Betz	X	BS Chem			MF & MPN	3 years
TECHNICIAN/ ANALYST	Hoy Burns	X	1 year*			MF & MPN	6 years
	Bob Lachapelle	X	1 year**			MF	1 year
	Gaines Honeycutt	X	AAS***			MF	1 year
	Gerald Monahan	X	BS Env.	Studies		MF	1 year

* 14 months Navy Clinical Lab School. Reg. Med. Tech.
** 14 months " " " " Lab supervisor 4 years
*** 6 years NC Dept. of Natural Resources

LABORATORY FACILITIES

Space in laboratory and preparation room is adequate for needs during peak work periods (200 ft^2 and 6 linear ft. of usable bench space per analyst).

Facilities are clean, with adequate lighting (100 ft-candles) and air conditioning.

Satisfactory

LABORATORY EQUIPMENT, SUPPLIES, AND MATERIALS

1. *pH Meter*

Manufacturer Corning Orion Model M10 701

Clean, calibrated to 0.1 pH units each use period; record maintained..... S

Aliquot of standard pH 7.0 buffer used only once..... S

2. *Balance-Top Loader or Pan*

Manufacturer Ohaus Model Harvard Trip

Clean. Detects a 50-mg weight accurately (for a general media preparation of ≥ 2-g quantities)..... S

Good quality weights in clean condition..... S

3. *Thermometers*

Rec. 0.1°C Trac. Therm., Max Reg.

Glass thermometers calibrated annually against a certified thermometer or one of equivalent accuracy; metal thermometers checked quarterly..... S

Legible graduations..... S

No separation in liquid column..... S

4. *Incubator or Incubator Room*

Manufacturer Precision Model M2

Sufficient size for daily work load..... S

Thermometer graduated in 0.5°C increments with bulb immersed in liquid and located on shelves in use..... S

Uniform temperature maintained on shelves in all areas used (35.0° ± 0.5°C) S

Temperature recorded daily or recording thermometer sensitive to ± 0.5°C... S

5. *Autoclave*

Manufacturer Market Forge Model Sterilmatic

Reaches sterilization temperature (121°C), maintains 121°C during sterilization cycle, and requires no more than 45 min for a complete cycle.. S

Pressure and temperature gauges on exhaust side and an operating safety valve..... S

No air bubbles produced in fermentation vials during depressurization..... S

Record maintained on time and temperature for each sterilization cycle..... S

Max.Reg. 121.3 (NCDHS) S

6. *Hot-Air Oven*

Manufacturer NA Model _____

Operates at a minimum of 170°C..... ____

Thermometer inserted or oven equipped with temperature-recording thermometer device..... ____

Time and temperature record maintained for each sterilization cycle..... ____

Thermometer bulb in sand (*optional*)

7. *Refrigerator*

Temperature maintained at 1° to ~~4.4°C (34° to 40°F)~~ 5.0°C..... S

8. *Inoculation Equipment*

Sterilized loops of at least 3-mm diameter, 22 to 24 gauge Nichrome, Chromel, or platinum-iridium wire..... S

Disposable, dry heat-sterilized, hardwood applicator sticks or presterilized loops..... NA

9. *Optical Equipment*

Low power magnification device (preferably binocular microscope with 10 to 15X) with fluorescent light source for counting MF colonies..... S

Colonies counted with a mechanical hand tally (*optional*)

10. *Membrane Filtration Equipment*

Manufacturer Millipore Model _____

Made of stainless steel, glass, or autoclavable plastic..... S

Nonleaking and uncorroded..... S

11. *Membrane Filters and Pads*

Manufacturer Millipore Type HAWG

Filters recommended by manufacturer for water analyses..... S

Filters and pads presterilized or autoclavable..... S

Lot numbers and dates of receipt of membrane filters recorded (*optional*)

12. *Glass, Plastic, and Metal Utensils for Media Preparation*

SP Automatic Washer Det.
Washing process provides glassware free of toxic residue as demonstrated by the inhibitory residue test and results recorded..... S

Glass items of borosilicate, free of chips and cracks..... S

Utensils clean and free from foreign residues or dried medium..... S

Plastic items clear with visible graduations..... S

13. *Sample Bottles*

Wide-mouth hard glass bottles; stoppered or plastic screw-capped; capacity at least 120 ml..... S

Glass-stoppered bottles with tops covered with aluminum foil or kraft paper..... NA

Screw-caps have leakproof nontoxic liners that can withstand repeated sterilization (30 min at 121°C)..... S

Sterility of each batch of sample bottles checked and results recorded..... S

14. *Pipets*

Brand Falcon Type TD

Sterile; glass or plastic; with a 2.5 percent tolerance..... S

Tips unbroken; graduations distinctly marked..... S

15. *Pipet Containers*

Aluminum or stainless steel..... NA

Pipets wrapped in ~~quality kraft paper (char resistant)~~..... S

Open packs of disposable sterile pipets resealed between uses..... S

16. *Culture Dishes*

Brand Pyrex / Millipore Type 100 X 15 / 49 X 9

Sterile plastic or glass..... S

Open packs of disposable sterile plastic dishes resealed between uses..... S

Dishes are in containers of aluminum or stainless-steel with covers or are wrapped with heavy aluminum foil or char-resistant paper..... S

17. *Culture Tubes and Closures*

Sufficient size to contain medium and sample without danger of spillage.... S

Metal or plastic caps; plastic plugs..... S

Borosilicate glass or other corrosion-resistant glass..... S

18. *Maintenance*

Service contracts or approved internal protocol maintained on balance, autoclave, water still, etc.; service records entered in a log book..... S

GENERAL LABORATORY PRACTICES

1. *Sterilization Procedures*

Timing for sterilization begins when autoclave reaches 121°C..... S

Tube broth media and reagents sterilized at 121°C 12 to 15 min..... S

Tubes and flasks packed loosely in baskets or racks for uniform heating and cooling..... S

Total exposure of MPN media to heat not over 45 min..... S

Dilution water blanks autoclaved at 121°C for 30 min..... S

MF presterilized or autoclaved at 121°C for 10 min fast exhaust..... S

MF assemblies and empty sample bottles sterilized at 121°C for 30 min..... S

MF assemblies sterilized between sample filtration series..... S

Rinse water volumes of 500 to 1,000 ml sterilized at 121°C for 45 min..... S

Wire loops, needles, and forceps sterilized..... S

Individual glassware items autoclaved at 121°C for 30 min..... S

Individual dry glassware items sterilized 2 hours at 170°C (dry heat)..... NA

Pipets, culture dishes, and applicator sticks in boxes sterilized at 170°C for 2 hours..... NA

MPN media removed and cooled as soon as possible after sterilization and stored in cool dark place (*optional*)

UV light or boiling water for at least 2 min may be used on membrane filter assemblies to reduce bacterial carry-over between each filtration (*optional*)

Heat-sensitive tapes and/or strips/ampoules used during sterilization (*optional*)

2. *Laboratory Pure Water*

Only laboratory pure water, used in preparing media, reagents, rinse water, and dilution water..... S

Laboratory pure water not in contact with heavy metals..... S

Source: Laboratory-prepared ✓ Purchased _____

If laboratory-prepared:

Still Manufacturer Corning Megapure 6L

Deionizer Manufacturer Corning High Cap.

Record of recharge frequency ✓

Production rate and quality adequate for laboratory needs..... S

Inspected, repaired, cleaned by service contract or in-house service..... S

a. Chemical Quality Control

Record of satisfactory annual analyses for trace metals

A single metal not greater than 0.05 mg/l..... ____

Total metals: equal to or less than 1.0 mg/l..... ____

Testing laboratory _____ Date _____

Record of monthly analyses of laboratory pure water

Conductance: >0.2 megohm resistivity or <5.0 microhmos/cm..... S

pH: 5.5 - 7.5..... S

Standard plate count: <10,000/ml..... S

Free chlorine residual: 0.0 <0.1..... S

b. Microbiological Quality Control

Test for bactericidal properties of distilled water (0.8 - 3.0) performed at least annually..... —

Testing laboratory _____ Date _____ Ratio _____

3. *Rinse and Dilution Water*

Stock buffer solution prepared according to "Standard Methods", 15th 13th edition..... S

Stock buffer solution adjusted to pH 7.2..... S

Stock buffer autoclaved at 121°C, stored at 1° to ~~4.4~~ 5.0°C (34° to 40°F) or filter sterilized..... S

Stock buffer labeled and dated..... S

Stock potassium phosphate buffer solution (1.25 ml) added per liter distilled water for rinse and dilution water..... S

Final pH 7.2 ± 0.1..... S

4. *Media*

Dehydrated media bottles kept tightly closed and protected from dust and excessive humidity in storage areas..... S

Dehydrated media not used if discolored or caked..... S

Laboratory pure water used in media preparation..... S

Media completely dissolved before dispensing to culture tubes or bottles... S

MPN tube media with loose-fitting caps used in less than 1 week..... NA

Tube media in screw-capped tubes held no longer than 3 months..... S

Media stored at low temperatures are incubated overnight prior to use and tubes with air bubbles discarded..... S

Media protected from sunlight..... S

MF media stored in refrigerator; broth media used within 96 hours, agar within two weeks if prepared in tight-fitting dishes..... S

Ampouled media stored at 1° to ~~4.4~~ 5.0°C and time limited to manufacturer's expiration date..... S

5. *Quality Control of Media and Reagents*

Satisfactory records containing complete quality control checks on media available for inspection..... S

Laboratory chemicals of Analytical Reagent Grade..... S

Dyes certified for bacteriological use..... NA

pH checked and recorded on each batch of medium after preparation and after sterilization..... S

Causes for deviations beyond ± 0.2 pH units specified..... S

Media ordered on a basis of 12-month need; purchases in ¼ lb. quantities, except those used in large amounts (*optional*)

Bottles dated on receipt and when opened (*optional*)

Opened bottles of routinely used media discarded within 6 months (if stored in desiccator storage may be extended) (*optional*)

Shelf life of unopened bottles not in excess of 2 years (*optional*)

New lots of media quality tested against satisfactory lot using natural water samples (*optional*)

6. *Lauryl Tryptose Broth*

Manufacturer Difco Lot No. 703562 2/87

Single strength composition, 35.6g per liter pure water..... S

Single strength pH 6.8 ± 0.2; double strength pH 6.7 ± 0.2..... S

Not less than 10 ml per tube..... S

Media made to result in single strength after addition of sample portions..... S

7. *Brilliant Green Lactose Bile Broth*

Manufacturer Difco Lot No. 686824 10/86

Medium composition 40g per liter pure water..... S

Final pH 7.2 ± 0.2..... S

8. *M-Endo Media*

Manufacturer Difco Lot No. 702638

Medium composition 48.0g per liter pure water; optionally 15g agar added/l..... S

Reconstituted in laboratory pure water containing 2 percent ethanol (not denatured)..... S

Final pH 7.2 ± 0.2..... S

Medium held in boiling water bath until completely dissolved..... S

9. *Standard Plate Count Agar*

Manufacturer Difco Lot No. 677117

Correct composition, sterile and pH 7.0 ± 0.2..... S

Sterile medium not remelted a second time after sterilization..... S

Culture dishes incubated 48 hours at 35° ± 0.5°C..... S

No more than 1.0 ml or less than 0.1 ml sample plated (sample or dilution). S

Liquefied agar, 10 ml or more; medium temperature between 44° to 46°C..... S

Melted medium stored no longer than 3 hours before use..... S

Only plates with between 30 to 300 colonies counted; when 1 ml of undiluted sample is plated, colony density may be less than 30..... S

Only two significant figures recorded and calculated as standard plate count/ml..... S

10. *Levine's Eosin Methylent Blue Agar (EMB)*

Manufacturer Difco Lot No. 70/060

Medium composition 37.5g per liter..... S

Final pH 7.1 ± 0.2..... S

METHODOLOGY

Methodology specified in "Standard Methods" ~~13th~~ 14th, 15th edition, or EPA manual..... S

M-Endo broth, M-Endo agar, or Les Endo agar used in a single step procedure..... S

In two-step Les M-Endo procedure, MF incubated on lauryl tryptose broth saturated absorbent pad for 1.5 to 2 hours at 3.5° ± 0.5°C; then on M-Endo broth at Les Endo agar for 20 to 22 hours at 35° ± 0.5°C..... NA

1. *Total Coliform Membrane Filter Procedure*

Samples containing excessive bacterial populations (greater than 200), confluency, or turbidity retested by the MPN procedure..... S

Filtration assembly sterile at start of each series..... S

Absorbent pads saturated with medium, excess discarded; or 4.0 ml of agar medium can be used per culture dish instead of a pad..... S

Sample shaken vigorously immediately before test..... S

Test sample portions measured and not less than 100 ml..... S

Funnel rinsed at least twice with 20- to 30-ml portions of sterile buffered water..... S

MF removed with sterile forceps, grasping outside effective filtering area..... S

MF rolled onto medium pad or agar so air bubbles are not trapped..... S

A start and finish MF control test (rinse water, medium and supplies) run with each filtration series and results recorded..... S

When controls indicate contamination occurred, all data on affected samples rejected and resampling requested..... S

a. Incubation of Membrane Filter Cultures

Total incubation time 22 to 24 hours at 35° ± 0.5°C..... S

Incubated in tight-fitting culture dishes or loose-fitting dishes incubated in high relative humidity chambers..... S

b. Membrane Filter Colony Counting

Samples repeated when coliforms are "TNTC" or colony growth is confluent, possibly obscuring coliform development and/or detection..... S

Total coliform count calculated in density per 100 ml..... S

Samples containing five or more coliforms per 100 ml are resampled and tested..... S

Low power magnification device with fluorescent light positioned for maximum sheen visibility..... S

c. Verification of Total Coliform Colonies

All typical coliform (sheen) colonies or at least five randomly selected sheen colonies from each positive sample verified in lauryl tryptose broth and BGLB..... S

Counts adjusted based on verification..... S

All atypical coliform (borderline sheen) colonies or at least five randomly-selected colonies verified in LTB and BGLB..... S

Counts adjusted based on verification..... S

Sheen colonies in mixed confluent growth reported and verified (*optional*)

d. MF Field Equipment

Manufacturer NA Model

Only standard laboratory MF procedures adapted to field application....

2. *Total Coliform Most Probable Number Procedure*

a. Presumptive Test

Five standard portions, either 10 or 100 ml..... S

Sample shaken vigorously immediately before test..... S

Tubes incubated at 35° ± 0.5°C for 24 ± 2 hours..... S

Examined for gas (any gas bubble indicates positive test)..... S

Tubes that are gas-positive within 24 hours submitted promptly to confirm test..... S

Negative tubes returned to incubator and examined for gas within 48 ± 3 hours; positives submitted to confirm test..... S

Public water supply samples with heavy growth and no gas production confirmed for presence of supressed coliforms..... S

Adjusted count reported based upon confirmation..... S

Adequate test labeling and tube dilution coding (*optional*)

b. Confirmed Test

Presumptive positive tube gently shaken or mixed by rotating..... S

One loopful or one dip of applicator transferred from presumptive tube to BGLB..... S

Incubated at 35°C ± 0.5°; checked within 24 hours ± 2 hours for gas production..... S

Positive confirmed tube results recorded; negative tubes reincubated and read within 48 ± 3 hours..... S

Unsatisfactory sample defined as three or more positive confirmed tubes..... S

Confirmation procedure carried out every 3 months on one sample from each problem water supply..... S

c. Completed Test

Applied to 10 percent of all positive samples each quarter..... S

Applied to all positive confirmed tubes in each test completed..... S

Positive confirmed tubes streaked on EMB plates for colony isolation.... S

Plates adequately streaked to obtain discrete colonies..... S

Incubated at 35° ± 0.5°C for 24 ± 2 hours..... S

Typical nucleated colonies, with or without sheen on EMB plates selected for completed test identification..... S

If typical colonies absent, atypical colonies selected for completed test identification..... S

If no colonies or only colorless colonies appear, confirmed test for that particular tube considered negative..... S

An isolated typical colony or two atypical colonies transferred to lauryl tryptose broth..... S

Incubated at 35° ± 0.5°C; checked for gas within 48 ± 3 hours..... S

Cultures producing gas in lauryl tryptose broth within 48 ± 3 hours are considered coliforms..... S

3. *Analytical Quality Control*

A record of analytical quality control tests available for review..... S

Duplicate analyses

Duplicate analyses run on positive polluted samples not to exceed 10 percent but a minimum of one per month (*optional*)

Positive Control Samples

One positive control sample (polluted water) run each month (*optional*)

Colony Counting (If more than one Analyst in Laboratory)

Two or more analysts count sheen colonies; all colonies are verified analysts' counts compared to verified counts; procedure is carried out at least once per month (*optional*)

Check Analyses by State Laboratories

A minimum of samples proportional to the local laboratory work load processed by State Laboratory (see criteria for recommendations) (*optional*)

SAMPLE COLLECTION, HANDLING, AND PRESERVATION

Representative samples of potable water distribution system..... S

Minimal sampling frequency as specified in the National Interim Primary Drinking Water Regulations..... S

Sample collector trained and approved as required by State regulatory authority or its delegated representative..... S

1. *Sample Bottles*

Sodium thiosulfate, (10 mg per 100 ml.) added to sample bottle before sterilization..... S

Ample air space remains after sample collected to allow for adequate mixing..... S

2. *Sampling*

Sample collected after maintaining a steady flow for 2 to 3 min to clear service line..... S

Tap free of aerator, strainer, hose attachment, water purification, or other devices..... S

Samples refrigerated when possible during transit and storage periods in the laboratory (*optional*)

3. *Sample Identification*

Sample identified immediately after collection..... S

Identification includes, water source, location, time and date of collection, and collector's name; insufficiently identified samples discarded..... S

Chlorine residual where applicable..... S

4. *Sample Transit Time*

Transit time for potable water samples sent by mail or commercial transportation, not in excess of 30 hours..... NA

No sample processed after 48-hour transit/storage..... NA

Samples delivered to laboratory by collectors examined the day of collection..... S

Data marked as questionable on samples analyzed after 30 hours..... NA

5. *Sample Receipt in Laboratory*

Sample logged in when received in laboratory, including date and time of arrival and analysis..... S

Chain-of-custody procedures required by State regulations followed..... S

DATA REPORTING

Sample information and laboratory data fully recorded..... S

Direct MF counts and/or confirmed MPN results reported promptly..... S

After MF verification and/or MPN completion, adjusted counts reported..... S

One copy of report form retained in laboratory or by State program for 3 years..... S

Test results assembled and available for inspection (*optional*)

ACTION RESPONSE TO LABORATORY RESULTS

Unsatisfactory test results given action response and resampled as defined in National Interim Primary Drinking Water Regulations..... S

State and responsible local authority notified within 48 hours after check samples confirm coliform occurrence..... S

All data reported to State and local authorities within 40 days..... S

QUALITY CONTROL PRACTICES

An outline of the quality control efforts of the laboratory available for review..... S

Date: 3 November 1982

Memorandum for the Record

From: Ms. Betz, Quality Cotrol Lab., Environmental Branch, NREAD, Facilities

Subj: State Inspection of Quality Control Lab for Microbiology Analysis

1. On 17 September 1982, Don Beesley, Lab Certification Evaluator with the State of North Carolina, called our lab and stated he was planning an inspection of the bacteria lab on 28 September 1982. If there were any problems to let him know.

2. On 28 September 1982, Don Beesley arrived to inspect the lab. Overall the inspection went well, he found no deviations. He did make some recommendations and they are covered below.

3. NBS thermometer. He recommended it be replaced with one calibrated in $0.1^{o}C$ divisions since all incubator thermometers were either 0.5 or 0.1 divisions.

4. Autoclave. Beesley highly recommended purchasing a maximum temperature thermometer to ~~make~~ check the autoclave's maximum temperature. He checked the autoclave with his maximum thermometer and it was fine. He suggested, from the States experience with these thermometers, that we get one from Brooklyn Thermometer Co., with factory certification at $121^{o}C$ (Code FC 121). The one he had was Cat# 1410MX12" with a range from $-10^{o}C$ to $203^{o}C$ with divisions of 1^{o} at a cost of $27.

5. Media. Don Beesley commented on the dark solids in the media. We stated it was happening quit regularly, with our Difco m-Endo broth. He recommended writing to Difco, also trying BBL m-Endo Broth.

6. Sample Bottles. He did not like the paper liners in our caps. He suggested using plastic, nalgene sample bottles (Cat# ASP: B7533-14, Fisher: 02-893A).

7. Dilution Water Buffer. He said to try $MnCl_2$ instead of $MnSO_4$. Also to be sure to use reagent grade.

8. Sampling. He recommended getting the state sampling film and instructing the operators in proper sampling.

9. Before departing, Don Beesley debrieffed Colonel Calta, Base Maintenance Officer and Mr. Danny Sharpe, Supervisory Ecologist.

Elizabeth A. Betz
Supervisory Chemist

Dear Dr. Bela,

Thank you for your letter of 3 November 1982 regarding the Environmental Protection Agency's Quality Control Laboratory for Thermoplastic Analysis.

We are pleased to inform you that your laboratory has been approved for certification. Enclosed please find the following documents:

1. Application for Certification, Form EPA-QC-114, which must be completed in full and returned to this office.
2. A copy of the Laboratory Certification Evaluation Manual, which describes the procedures that will be followed during the on-site inspection.
3. A schedule of proficiency testing samples that will be distributed to your laboratory during the first year of certification.

Please note that the on-site inspection must be scheduled at least 30 days in advance. Our inspection team typically requires two full days to complete the evaluation.

If you have any questions, please do not hesitate to contact me at the address or telephone number listed above.

Sincerely,

Mildred A. Bent
Chief, Laboratory Certification Section

#27

FACTORY CERTIFICATE

CODE: FC 121°

MAX TEMP THERMO

BROOKLYN THERMOMETER CO. IN
90 VERDI ST.
FARMINGDALE NY 11735

516 694-7610

ARMOR CASE
CAT #. $
12" 6112 ~7.00

THER
141 0 MX 12" -10-203°C
1° DIVISION #27

FACTO THERMOMETER 0.1° NBS REGISTERED

DIFCO WRITE LETTER

BBL ~~M~~ENDO BROTH

PLASTIC NALENGE SAMPLE BOTTLES

CONDUCTIVITY

BUFFER → 7.1 ÷ 7.3

7.2

REAGENT GRADE →

$MnSO_4$ → $MnCl_2$

FISHER (NOT FISHER)

THOMAS

MAX. TEMP THERMOMETER

~~4010~~

1410 MX BROOKLYN

NATURAL RESOURCES AND ENVIRONMENTAL AFFAIRS BRANCH
Base Maintenance Division
Marine Corps Base
Camp Lejeune, North Carolina 28542

Date 9-22-82

From: Director, NREAB
To: BMO

Subj: Annual Laboratory inspection (Bact. analysis) by State 28 Sept 82

attached submitted for your info.

Julian

BWR

NREA,
bring Mr Beesley from BMO office following inspection.
Thx
BWR

To Doug
Julian

Betsy - we need a debrief by Mr. Beesley.

OPNAV 5216/144 (REV. 6-70)
S/N 0107-LF-778-8097

DEPARTMENT OF THE NAVY

Memorandum

To: Director
for info.
D. Sharpe

DATE: 21 September 1982

FROM: Ms. Betz, Quality Control Lab., Environmental Section, NREAB, BMaintDiv

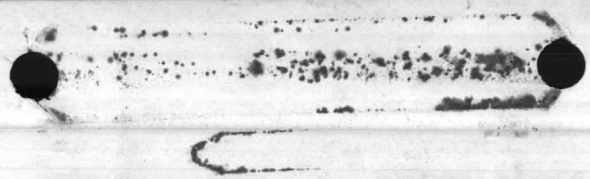
TO: Mr. Sharpe, Supervisory Ecologist, Environmental Section, NREAB, BMaintDiv

SUBJ: State Inspection of Quality Control Laboratory for Bact Analysis.

1. Don Beesley, Laboratory Certification Evaluator with the State, wants to come and evaluate the lab for our regular Microbiological analysis inspection. He would like to come on the afternoon of 28 September 1982, which is our drinking water day. He did not specify that he wanted to come on our sample day.

2. He called on 17 September 1982, which was while I was out, and Gaines took the message. Mr. Beesley said if there were any problems to call him.

Elizabeth A. Betz
Supervisory Chemist



STATE OF NORTH CAROLINA

JAMES B. HUNT, JR.
GOVERNOR

SARAH T. MORROW, M.D., M.P.H.
SECRETARY

DEPARTMENT OF HUMAN RESOURCES

Division of Health Services

HUGH H. TILSON, M.D.
DIRECTOR

STATE LABORATORY OF PUBLIC HEALTH
306 NORTH WILMINGTON STREET
P.O. BOX 28047 RALEIGH 27611

September 18, 1981

Commanding General
Marine Corps
Camp Lejeune, North Carolina 28542

Dear Sir:

The findings of the on-site evaluation on August 19, 1981 and your letter of September 14, 1981 citing correction of deviations indicate that your laboratory has met the minimum requirements for certification as specified in North Carolina Drinking Water Regulations (10NCAC 9D .0301 - .0326). We therefore grant Interim Certification to your laboratory for total coliform analysis on public water supplies.

If you have any questions or if we may be of further assistance in this matter, please let us know.

Sincerely,

John C Sheats

John C. Sheats, Head
Environmental Sciences Branch

E. D. Beesley

E. D. Beesley
Laboratory Certification Evaluator

JCS;EDB/leh
Enclosure

MAIN/EAB/th
6280/7
Sep 14, 1981

Mr. E. D. Beesley
Laboratory Certification Evaluator
State Laboratory of Public Health
Division of Health Services
Department of Human Resources
State of North Carolina
306 North Wilmington
Post Office Box 28047
Raleigh, North Carolina 27611

Dear Sir:

This is in response to your 2 September 1981 correspondence concerning drinking water analysis certification of the Quality Control Laboratory, Base Maintenance Division, Marine Corps Base, Camp Lejeune, North Carolina.

Your letter provided a narrative report on your 19 August 1981 visit which listed three points under Deviations and Recommendations. The three points have been corrected as follows:

Point 1. Difco Catalog No. 241 Lauryl Tryptose Broth and Difco Catalog No. 7 Brillant Green Bile Broth in one-fourth pound bottles were ordered on 20 August 1981, to replace the 1978 bottles.

Point 2. On 20 August 1981, Difco Catalog No. 479 Plate Count Agar was ordered to replace Nutrient Agar.

Point 3. On 20 August 1981, Difco Catalog No. 76 EMB Agar was ordered to replace Endo Agar.

Should you require additional information regarding the corrective action taken, please contact Ms. Elizabeth Betz, Natural Resources and Environmental Affairs Branch, Base Maintenance Division, telephone (919) 451-5977.

Sincerely,

B. W. ELSTON
Acting Base Maintenance Officer
By direction of the Commanding General

Mr. E. D. Beesley
Laboratory Certification Evaluator
Saate Laboratory of Public Health
Division of Health Services
Department of Human Resources
State of Norhh Carolina
306 N. Wilmington, PO Box 28047
Raleigh, North Carolina 27611

Dear Sir:

This is in response to your letter of 2 September 1981 concerning your inspection on 19 August 1981, of the Quality Contool Laboratory under Base Maintenance Division, aboard Marine Corps Base Camp Lejeune, North Carolina.

Enclosed in your letter of 2 September 1981, was a copy of the narrative report on your 19 August 1981 visit. In the report you listed three points under Deviations and Recommendations. The three points are addressed below.

The fist point was the 1978 Lauryl Tryptose Broth and Brilliant Green Bile Broth. Difco Cat #241 Lauryl Tryptose Broth and Difco Cat #7 Brillant Green Bile Broth in ½ lb. bottles were ordered on 20 August 1981, tp replace the 1978 bottles.

The second point was on Standard Plant Count agar. On 20 August 1981, Difoo Cat #479 Plate Count Agar was ordered to replace Nutrient Agar.

The last point was on Levine's Eosin Methylene Blue Agar. On 20 August 1981, Difco Cat #76 EMB AGar was ordered to replace Endo Agar.

Should yourrequire additional information regarding the corrections hade, please contact Ms. Elizabeth Betz, Natural Resources and Environmental Affairs Branch, Base Maintenance Division, telephone (919) 451-5977.

Mr E. D. Beesley

Laboratory Certification Evaluator

State Laboratory of Public Health

Division of Health Services

Depart. of Human Resources

State of North Carolina

306 N. Wilmington St, P.O Box 28047

Raleigh, NC 27611

Dear Sir:

This is in response to your letter of 2 September 1981 concerning your inspection on 19 August 1981. of the Quality Control Laboratory under Base Maintenance Division aboard Marine Corps Base, Camp Lejeune, North Carolina.

Enclosed in your letter of 2 September 1981 was a copy of the narrative report on your 19 August 1981 visit. In the report you listed three points under deviations and recommendations. The three points are addressed below.

The first point was the 1978 Lauryl Tryptose Broth and Brilliant Green Bile Broth. Difco Cat # 241 Lauryl Tryptose Broth and Difco Cat # 7 Brillant Green Bile Broth in 1/4 lb bottles were ordered on 20 August 1981 to replace the 1978 bottles.

THE SECOND POINT WAS ON STANDARD PLATE COUNT AGAR. ON 20 AUGUST 1981 DIFCO CAT # 479 PLATE COUNT AGAR WAS ORDERED TO REPLACE NUTRIENT AGAR.

THE LAST POINT WAS ON LEVINE'S EOSIN METHYLENE BLUE AGAR. ON 20 AUGUST 1981 DIFCO CAT # 76 EMB AGAR WAS ORDERED TO REPLACE ENDO AGAR.

SHOULD YOU REQUIRE ADDITIONAL INFORMATION REGARDING THE CORRECTIONS MADE, PLEASE CONTACT MS. ELIZABETH BETZ, NREAB, BMAINT DIV., TELEPHONE (919) 451-5977

Please Note and Return.
I plan to return this to Betsy
for action and I [redacted]
recommend we make the suggested
changes - even those that are not absolutely
required.

Shaye

DDS

Date: 26 August 1981

From: Quality Control Lab., Environmental Section, NREAB, BMaintDiv

Memorandum for the Record

Subj: Staee Inspection for Microbiological Laboratory Certification

1. On 19 August 1981, Mr. Don Beesley, a laboratory certification evaluator of the Public Health Laboratory, Division of Health Services, Department of Human Resources, State of North Carolina came and inspected the Quality Control Lab. for Micrôbiological analysis.

2. A list was provided to Mr. Beesley of the Laboratory personnel and their experience as required by the inspection evaluation forms. The following personnel were listed:

Eliazbeth Betz-Laboratory Director
Hoy Burns
Robert Lachapelle
Gaines Huneycutt
Gerald Monahan

3. The only unsatisfactory ratings were received for using the wrong agars for Standard Plate Counts and Completed Test(MPN). The lab needs to use Standard Methods Agar and EMB Agar and a requisition order was made on 20 August 1981 for the correct agars.

4. Mr. Beesley made several recommendations and they are discussed in the following paragraphs.

5. Mr. Beesley recommended purchasing a new NBS thermometer with either 0.5 or 0.1 graduations since the incubator thermometers were required to be in 0.5 graduations and are in fact in 0.1 graduations. O.K. DDS

6. It was discussed that the 15th edition of Standard Methods was the newly accepted reference manual by the State and EPA. Therefore Mr. Beesley suggested we should order one. He stated that it had some new procedures in it. O.K. DDS

7. Mr. Beesley commented on our rather old LTB & BGB agar. He suggested ordering some new and in smaller quantities since we didn't use it that often. The requisitions were submitted on 20 August 1981.

8. On in house maintenance on equipment, mainly the stills, Mr. Beesley suggested we should keep a complete and separate record in addition to our present procedure of putting the date of the last cleaning on the still. O.K. DDS

9. On collection, I stated that the Water Plant operators were responsible for sample collection but that we do work with them to help train them. He suggested showing them ahe movie the State has on sample collection. Mr. Beesley said it was available to use.

Get with Price/Frazelle

10. Finally, Mr. Beeslye recommended running another trace metal analysis on the Still's water as soon as it was working again since it has been over a year. He stated that the Staee could run it this time but not again. Tharefore, by next August this lab will need to be cetified in trace metals or we will have to find a lab that is.

Elizabeth A. Betz

Elizabeth A. Betz
Supervisory Chemist

10. Finally, Mr. Deeley recommended running another trace metal analysis on the Seattle water as soon as it was working again since it has been over a year. It stated that the State could run it this time but not again. Therefore, by next August the lab will need to be certified in trace metals or we will have to find a lab that is.

Elizabeth A. Dere
Supervisory Chemist

Date: 26 August 1981

From: Quality Control Lab., Environmental Section, NREAB, BMaintDiv

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Elizabeth A. Betz

Elizabeth A. Betz
Supervisory Chemist

WRITE MEMO FOR RECORD.

NBS 0.5 OR 0.1 THERMOMETER.

15TH EDITION STANDARD METHODS

NEW LTB + BGB 1/4 lbs

STANDARD METHODS AGAR
STANDARD PLATE COUNT AGAR

EMB AGAR

FILM ON COLLECTION

MAINTENANCE RECORD.

RECEIVED FROM BEESLEY

Instrument _____ Temperature _____ Room _____

Read daily.
Record temperature in space provided.

Date	Jan.	Feb.	Mar.	Apr.	May	June	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Date
1													1
2													2
3													3
4													4
5													5
6													6
7													7
8													8
9													9
10													10
11													11
12													12
13													13
14													14
15													15
16													16
17													17
18													18
19													19
20													20
21													21
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23													23
24													24
25													25
26													26
27													27
28													28
29													29
30													30
31													31

FIGURE IV-A-1. Equipment Operation Temperature Record.

TABLE IV-A-2

Glassware Maintenance

Item	Monitoring Procedure
1. Utensils and Containers for Media Preparation	Use utensils and containers of non-corrosive and non-contaminating materials such as pyrex glass, stainless, steel or aluminum.
2. Glassware (Reusable)	a. With each use, examine glassware especially screw-capped dilution bottles and flasks, for chipped or broken edges and etched surfaces. Discard chipped or badly-etched glassware. b. Inspect glassware after washing. If water beads excessively on the cleaned surfaces, run the glassware through again. c. Test for acid or alkaline residues by adding bromthymol blue indicator to representative glassware items (see 5.1.2 in This Section). d. Test for residual detergent by the test in 5.1.3, This Section.

STATE OF NORTH CAROLINA

JAMES B. HUNT, JR.
GOVERNOR

SARAH T. MORROW, M.D., M.P.H.
SECRETARY

DEPARTMENT OF HUMAN RESOURCES

Division of Health Services

HUGH H. TILSON, M.D.
DIRECTOR

STATE LABORATORY OF PUBLIC HEALTH
306 NORTH WILMINGTON STREET
P.O. BOX 28047 RALEIGH 27611

May 18, 1981

Commanding General
Marine Corps Base
Camp Lejeune, North Carolina 28542

Attention: Base Maintenance Officer

Dear Sir:

The findings of the on-site evaluation on February 20, 1980 and your letter of May 12, 1981 citing correction of deviations indicate that your laboratory has met the minimum requirements for certification as specified in North Carolina Drinking Water Regulations (10NCAC 9D .0301 - .0326). We therefore grant Interim Certification to your laboratory for total coliform analysis on public water supplies.

If you have any questions or if we may be of further assistance in this matter, please let us know.

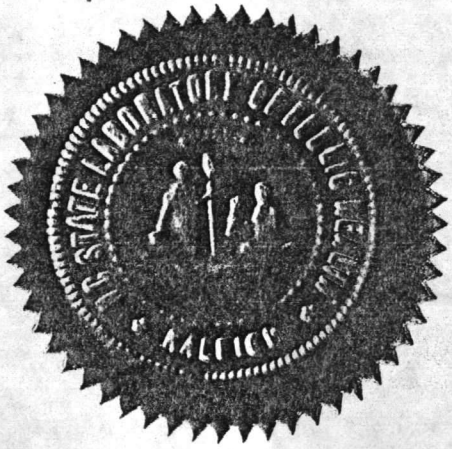
Sincerely,

John C. Sheats

John C. Sheats, Head
Environmental Sciences Branch

JCS/leh
Enclosure
Blind Copy: Elizabeth Betz

North Carolina
Department of Human Resources
Division of Health Services



Interim Certification

for the analysis of drinking water

has been granted to

CAMP LEJEUNE BACTERIOLOGY LABORATORY

for the following parameters

Coliform Bacteria - by Membrane Filter Procedure

February 1982
Expiration Date

100
Laboratory Number

Hugh H. Tilson MD
Director, Division of Health Services

Mildred Kerbaugh
Chief, State Laboratory of Public Health

Certification Officer

STATE OF NORTH CAROLINA

JAMES B. HUNT, JR.
GOVERNOR

SARAH T. MORROW, M.D., M.P.H.
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John C. Sheats

John C. Sheats, Head
Environmental Sciences Branch

JCS/leh
Enclosure

MR. JOHN SHEATS
ENVIRONMENTAL SCIENCES BRANCH LABORATORY
DEPT. OF HUMAN RESOURCES
POST OFFICE BOX 28047
RALEIGH, NORTH CAROLINA 27611

DEAR MR. SHEATS;

THIS AS A FOLLOW-UP TO A 19 SEPTEMBER 1980 LETTER TO MR. CHARLES E. RUNDGREN OF YOUR DEPARTMENT ~~REQUESTING LABORATORY AND PERSONNEL CERTIFICATION TO PERFORM ON OR~~ CONCERNING ~~O' THE ST~~ STATIS OF THE CORRECTIONS NEEDED FOR CERTIFICATION. AS STATED IN THE 19 SEPT 1980 LETTER THE ONLY DISCRENPANCY ~~IN~~ LEFT TO CORRECT WAS THE INHIBITORY TEST.

THE INHIBITORY TEST ON THE WASHING PROCESS HAD BEEN DELAYED UNTIL THE RECENTLY PURCHASED DISHWASHER HAD BEEN ~~COMPLETEDLY~~ INSTALLED.. ~~AND AND THE REQUIRED GLASS PETRI DISHES~~ ON ~~MARCH~~ 4 MARCH 1981 THE INHIBITORY TEST, AS DESCRIBED IN STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER, 13TH EDITION, p. 643, WAS RUN ON THE DISHWASHER. BELOW ~~IS A TABLE OF THE AVERAGE~~ STANDARD PLATE ~~COUNTS FOR EACH GROUP~~ IS A TABLE OF THE AVERAGE STANDARD PLATE COUNTS OF THE RESULTS. GROUP A WAS WERE GLASS THE PETRI DISHES WASHED AND RINSED THROUGH THE NORMAL CYCLE ON THE DISHWASHER ~~THE USUAL WAY~~. GROUP B WERE GLASS THE PETRI DISHES WASHED LIKE A BUT HAD RINSED

12 ADDITIONAL RINSINGS WITH DISTILLED WATER. GROUP C WERE THE PETRI DISHES ~~WERE~~ WASHED BUT NOT ~~RINSED~~ BEFORE ~~DRYING~~. WE ALSO SET UP A ~~FOUR GROUP D, SINCE WE USED PRE~~ WHICH WERE ~~PRESTERILIZED PLASTIC PETRI DISHES SINCE WE USE THESE PLA THEMPRESTERILI IS RUN OUR STANDARD~~ PLATE ~~COUNTS AND NOT THE GLASS ONES. THE RESULTS ARE BY TABLE BELOW ARE THE AVERAGE STANDARD PLANE COUNTS FOR EACH GROUP.~~

GLASS

LIKE A

REMOVED ~~DRYING~~ DURING THE

(AND REPLACED FOR)

GROUP	AVERAGE STANDARD PLATE COUNT/ML
A	150
B	156
C	182
~~D~~	~~409~~

THE~~THE~~ DIFFERENCE BETWEEN GROUPS A AND B IS LESS THAN 15% ~~THEREFORE SHOWING THAT~~ AND ~~THE DIFFERENCE~~ BETWEEN GROUPS A AND C IS GREATER THAN 15% THEREFORE SHOWING THAT THE CLEANING DETERGENT HAS ~~INH~~ SLIGHT INHIBITORY PROPERTIES ~~BUT~~ THAT ARE ELIMINATED DURING ROUTINE WASHING.

SHOULD YOU REQUIRE ADDITIONAL INFORMATION, PLEASE CONTACT MS. ELIZABETH BETZ, NR AND EA D, BASE MAINT. DEPT., TELEPHONE (919) 451-5977

MAIN/JIW/th
6280
19 Sep 80

Mr. Charles E. Rundgren
Water Supply Branch
Division of Health Services
Department of Human Resources
Post Office Box 2091
Raleigh, North Carolina 27602

Dear Mr. Rundgren:

This is a follow-up to a 19 October 1978 Marine Corps Base letter requesting laboratory and personnel certification to perform bacteriological and inorganic chemical tests of drinking water supplies located and operated by Marine Corps Base, Camp Lejeune, North Carolina.

Since 1978, personnel from your agency have visited the base on one occasion. On 21 February 1980, Mr. Ralph Gentry, Microbiologist, Quality Assurance and Laboratory Evaluation Section, Surveillance and Analysis Division, Region IV, Environmental Protection Agency, conducted an on-site bacteriological evaluation of the Base Quality Control Laboratory located at Building 65.

The inhibitory test on the washing process has been delayed until the installation of a recently purchased dishwasher has been completed. All other recommendations made by Mr. Gentry for improving the laboratory equipment and procedures have been fully implemented. The bactericidal properties test on the laboratory distilled water supply was requested during a telephone conversation with Mr. John Sheats of your office, on 17 April 1980, and is expected to be conducted in the near future.

Should you require additional information regarding this request, please contact Ms. Elizabeth Betz, Natural Resources and Environmental Affairs Division, Base Maintenance Department, telephone (919) 451-5977.

Sincerely,

B. W. ELSTON
Acting Base Maintenance Officer
By direction of the Commanding General

Copy to:
Cmdr NAVFACENGCOM (Code 114)

12 JAN 1980
Fine Conv between D. Sheats & Elizabeth Hair

Mr. Charles E, Rundgren
Water Supply Branch
Division of Health Services
Department of Human Resources
Post Office Box 2091
Raleigh, North Carolina 27602

Dear Sir:

This Letter is a follow up to a 19 October 1978 request for Laboratory and personnel certification to perform bacetiological and inorganic chemical tests from MCB Camp Lejeune.

Since 1978 personnel from your agency have visited on one occasion. On 21 February 1980, Mr. Ralph Gentry, Microbiologist, Quality Assurance and Laboratory Evaluation Section, Surveillance and Analysis Division, Region IV, Environmental Protection Agency conducted an on-site bacteriological laboratoty evaluation of the Base Laboratory. All recommendations made by Mr. Gentry for improving the laboratory equipment and procedures have been fully implemented expept for the following:

(a) The inhibitory test on the washing process has been delayed until the installation of a recently purchased dishwasher has been completed.

(b) The bactericidal properties test on the laboratoey distilled water supply was requested during a telephone conversationwith Mr. John Sheats of your office on 17 April 1980 and is expected to be conducted in the near future.

Please advise as to what further actions are required. Should you require additional information, regarding this request, please contact Miss Elizabeth Betz, Base Maintenance Department, Telephone 451-5977.

21 FEB 1980

EPA ON-SITE - BACT By R. E. GENTRY

- John Sheats ~~with~~ will be incharged of N.C. Lab. CERT. Program

25 FEB 80 - MOVE NBS THERMOMETER TO SAFER PLACE

25 FEB 80 - RECORD CORRECTED TEMPERATURE, MARK CORRECTION
NONE REQUIRED FACTOR ON THERMOMETERS

← - START RECORDING TEMP. THE DAY BEFORE USAGE TO MAKE SURE ALL ~~##~~ NEEDED ADJUSTMENTS ARE MADE

ORDERED
22 FEB 80 - NEED THERMOMETERS IN $\frac{1}{2}^{\circ}$ INCREMENTS, SUGGESTED 20-50°C CALIBRATED IN $\frac{1}{10}^{\circ}$ INCREMENTS

ORDERED
25 FEB 80 SUGGESTED NEW INCUBATOR

23 APR
26 ~~MAR~~ 80 TRACE METALS ON DISTILLED WATER

17 APR 80
PHONE CON
WITH SHEATS BACTERICIDAL PROPERTIES ON DISTILLED WATER

STARTED
11 MAR 80 RECORD TIME COLLECTED

DISHWASHER
ARRIVED
WILL RUN WHEN
INSTALLED INHIBITORY TESTS ON WASHING PROCESS

SAMPLES WILL BE MEASURED

Notes on R. Gentry's Inspection

~~An~~ Incubator

Start Reading and correcting factor. on sheet
Start Reading on Monday morning and make any adjustments.

← 20°-50° calibrated in 10ths (3) or 4

↙ New incubator-

GV light case -

John Sheats - Service on bactericidal properties under $100 - well worth it

Make sure everything is Labeled & dated

↙ ~~Put~~ Stock buffer in tubes.

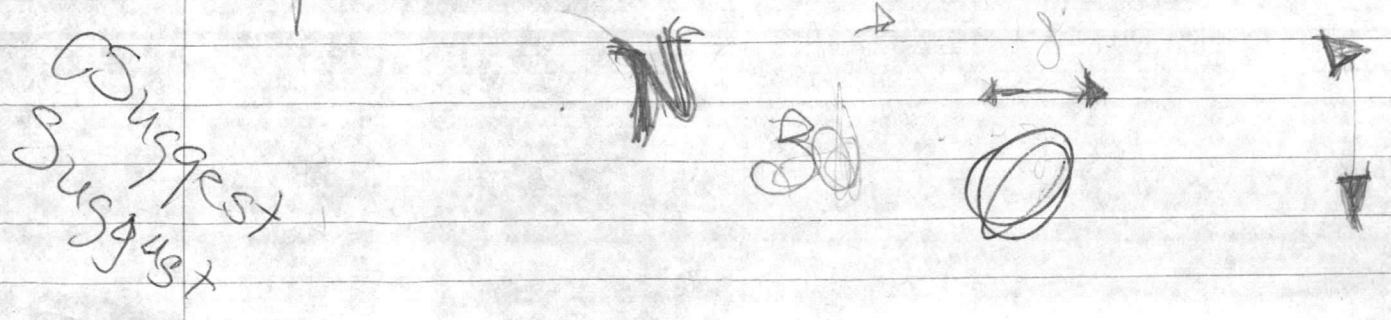
Order some more prepared media - M. Hypore

{ ~~Bad~~ samples -
~~State~~ unsatisfactory
and don't give count until verified

Start writing time collected

Q.C. - rule a positive, let everyone count it, compare counts, verify each one

Duplicates on Fecal.



Inhibitory tests - make statement accordingly about dishwasher

Bact. test on dist. H_2O - state arrangement, make statement to that effect

← Glass funnels or measured in grad. cylinder

Measured samples !!!!!!!!!

Mr. Bobby J. Carroll, Chief
Laboratory Services Branch
U S Environmental Protection Agency
College Station Road
Athens, Ga 30605

Mr. JOHN SHEATS
Enviornmental Sciences Branch Lab.
P.O. Box 28047
Raleigh, N.C. 27611
733-7308

ENVIRONMENTAL PROTECTION AGENCY
REGION IV
SURVEILLANCE AND ANALYSIS DIVISION
ATHENS, GEORGIA 30601

January 30, 1980

REF: 4SA-LS

Commanding General
Marine Corps Base
Camp Lejeune, NC 28542

Dear Sir:

On February 21, 1980, I will conduct an on-site bacteriology laboratory evaluation of the Quality Control Laboratory in the Natural Resources Division under Base Maintenance.

This evaluation is a requirement prior to the granting of interim certification to laboratories analyzing public drinking water supplies.

The on-site evaluation and date have been discussed with Ms. Elizabeth Betz of the Quality Control Laboratory.

If you have any questions, please contact me at 404/546-3176.

Sincerely yours,

Ralph E. Gentry

Ralph E. Gentry
Microbiologist
Quality Assurance &
Laboratory Evaluation Section

cc - John Sheats
NC Dept. of Human Resources
Raleigh, NC

133-7186
-7308