# 301 (h) MODIFIED PERMIT APPLICATION

"REVISED"

NORTHERN DISTRICT

SEWAGE TREATMENT PLANT

Recd. EPA 2/14/01


# GUAM WATERWORKS AUTHORITY

*Aturidat Kinalamten Hanom Guahan*

**Government of Guam**

**Post Office Box 3010, Hagåtña, Guam 96932**

**Phone: (671)479-7823/7820 Fax: (671)649-0158**


FEB 05 2001

Norman L. Lovelace
Manager, Pacific Insular Area Programs
U.S. Environmental Protection Agency
Pacific Insular Areas Program
75 Hawthorne Street (CMD-5)
San Francisco, CA 94105

Re: Revised NPDES Permit Application for the Northern District Wastewater Treatment Plant

Dear Norman,

Enclosed is GWA's revised 301(h) Modified NPDES permit application for the Northern District Wastewater Treatment Plant. The information provided on the application is the latest regarding the operation, maintenance, and scheduled improvements for the plant. GWA is presently in the process of conducting a new Expanded Effluent Testing for the Northern District WWTP and will submit the results as soon as they become available. We are currently reviewing the guidelines provided by your Office concerning the Toxicity Testing requirements. GWA will most likely contract this requirement out to one of the qualified labs listed by your Office. We will inform your Office of our arrangement no later than the end of March this year.

According to GMP Associates Inc. (consultant for the design and construction of the outfall extensions), its subcontractor has completed the test borings at both the Agana and Northern District outfall extension sites. Included in the Technical Support section of the revised application (Tab 4) is a copy of the receiving water quality report for both proposed outfall sites. The requested biological monitoring information will be sent to your office as soon as it becomes available.

Included in this revised application are the construction schedules for both the Agana and Northern District WWTPs outfall extensions. GWA will keep you updated on the status of the design, and all subsequent matters regarding the outfall extensions.

Please advise me if additional information is needed to complete the application process. I can be reached at (671) 479-7823, fax (671) 479-7879 or e-mail at hjjohn@ite.net.

Sincerely,

Herbert J. Johnston
General Manager

**REVISED**

NPDES 301(h) MODIFIED
PERMIT APPLICATION

**NORTHERN DISTRICT**
SEWAGE TREATMENT PLANT

# REVISED SECTION

## TABLE OF CONTENTS

SIGNITORY & CERTIFICATION STATEMENT

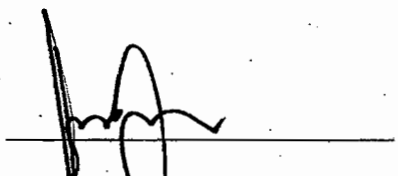
FEB 05 2001

I certify that I am the General Manager of the Guam Waterworks Authority having responsibility for the overall operations of the Authority.

**********

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for the knowing violations.

NPDES Application
Public Agency



Herbert J. Johnston
General Manager
Guam Waterworks Authority
(671) 479-7823

ND 1432

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NPDES FORM 1 & FORM 2A

Please print or type in the unshaded areas only
(Fill—in areas are spaced for elite type, i.e., 12 characters/inch).

Form Approved. OMB No. 2040-0086.

FORM 1 GENERAL

U.S. ENVIRONMENTAL PROTECTION AGENCY

# GENERAL INFORMATION

*Consolidated Permits Program*

*(Read the "General Instructions" before starting.)*

**I. EPA I.D. NUMBER**

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | F | G | U | 0 | 0 | 2 | 0 | 1 | 4 | 1 | | 14 | D 15 |

LABEL ITEMS

I. EPA I.D. NUMBER

III. FACILITY NAME

V. FACILITY MAILING ADDRESS

VI. FACILITY LOCATION

PLEASE PLACE LABEL IN THIS SPACE

**GENERAL INSTRUCTIONS**

If a preprinted label has been provided, affix it in the designated space. Review the information carefully; if any of it is incorrect, cross through it and enter the correct data in the appropriate fill—in area below. Also, if any of the preprinted data is absent *(the area to the left of the label space lists the information that should appear)*, please provide it in the proper fill—in area(s) below. If the label is complete and correct, you need not complete Items I, III, V, and VI *(except VI-B which must be completed regardless)*. Complete all items if no label has been provided. Refer to the instructions for detailed item descriptions and for the legal authorizations under which this data is collected.

## II. POLLUTANT CHARACTERISTICS

**INSTRUCTIONS:** Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold—faced terms.

| SPECIFIC QUESTIONS | MARK 'X' YES | NO | FORM ATTACHED |
|---|---|---|---|
| A. Is this facility a publicly owned treatment works which results in a discharge to waters of the U.S.? (FORM 2A) | X | | X |
| B. Does or will this facility *(either existing or proposed)* include a concentrated animal feeding operation or aquatic animal production facility which results in a discharge to waters of the U.S.? (FORM 2B) | | X | |
| C. Is this a facility which currently results in discharges to waters of the U.S. other than those described in A or B above? (FORM 2C) | | X | |
| D. Is this a proposed facility *(other than those described in A or B above)* which will result in a discharge to waters of the U.S.? (FORM 2D) | | X | |
| E. Does or will this facility treat, store, or dispose of hazardous wastes? (FORM 3) | | X | |
| F. Do you or will you inject at this facility industrial or municipal effluent below the lowermost stratum containing, within one quarter mile of the well bore, underground sources of drinking water? (FORM 4) | | X | |
| G. Do you or will you inject at this facility any produced water or other fluids which are brought to the surface in connection with conventional oil or natural gas production, inject fluids used for enhanced recovery of oil or natural gas, or inject fluids for storage of liquid hydrocarbons? (FORM 4) | | X | |
| H. Do you or will you inject at this facility fluids for special processes such as mining of sulfur by the Frasch process, solution mining of minerals, in situ combustion of fossil fuel, or recovery of geothermal energy? (FORM 4) | | X | |
| I. Is this facility a proposed stationary source which is one of the 28 industrial categories listed in the instructions and which will potentially emit 100 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5) | | X | |
| J. Is this facility a proposed stationary source which is NOT one of the 28 industrial categories listed in the instructions and which will potentially emit 250 tons per year of any air pollutant regulated under the Clean Air Act and may affect or be located in an attainment area? (FORM 5) | | X | |

## III. NAME OF FACILITY

1 SKIP NORTHERN DISTRICT WWTP

## IV. FACILITY CONTACT

| A. NAME & TITLE (last, first, & title) | B. PHONE (area code & no.) |
|---|---|
| 2 EDWARD REYES, WASTEWATER MANAGER | 671 479 7885 |

## V. FACILITY MAILING ADDRESS

| A. STREET OR P.O. BOX | |
|---|---|
| 3 P.O. BOX 3010 | |

| B. CITY OR TOWN | C. STATE | D. ZIP CODE |
|---|---|---|
| 4 HAGATNA | GU | 96932 |

## VI. FACILITY LOCATION

| A. STREET, ROUTE NO. OR OTHER SPECIFIC IDENTIFIER | |
|---|---|
| 5 ROUTE 34 | |

B. COUNTY NAME

| C. CITY OR TOWN | D. STATE | E. ZIP CODE | F. COUNTY CODE (if known) |
|---|---|---|---|
| 6 HARMON ANEX | GU | 96912 | |



CONTINUE ON REVERSE

CONTINUED FROM THE FRONT

**VII. SIC CODES** *(4-digit, in order of priority)*

| A. FIRST | B. SECOND |
|---|---|
| 4941 (specify) WATER SUPPLY | 4952 (specify) SEWAGE |

| C. THIRD | D. FOURTH |
|---|---|
| (specify) | (specify) |

**VIII. OPERATOR INFORMATION**

**A. NAME**

GUAM WATERWORKS AUTHORITY

**B. Is the name listed in Item VIII-A also the owner?** ☒ YES ☐ NO

**C. STATUS OF OPERATOR** *(Enter the appropriate letter into the answer box; if "Other", specify.)*

F = FEDERAL S = STATE P = PRIVATE M = PUBLIC *(other than federal or state)* O = OTHER *(specify)*

M (specify)

**D. PHONE** *(area code & no.)*

A 671 479 7823

**E. STREET OR P.O. BOX**

P.O. BOX 3010

| F. CITY OR TOWN | G. STATE | H. ZIP CODE | IX. INDIAN LAND |
|---|---|---|---|
| HAGATNA | GU | 96932 | Is the facility located on Indian lands? ☐ YES ☒ NO |

**X. EXISTING ENVIRONMENTAL PERMITS**

| A. NPDES *(Discharges to Surface Water)* | D. PSD *(Air Emissions from Proposed Sources)* |
|---|---|
| N | P |

| B. UIC *(Underground Injection of Fluids)* | E. OTHER *(specify)* | (specify) |
|---|---|---|
| U | 9 | |

| C. RCRA *(Hazardous Wastes)* | E. OTHER *(specify)* | (specify) |
|---|---|---|
| R | 9 GU0020141 | OCEAN OUTFALL |

**XI. MAP**

Attach to this application a topographic map of the area extending to at least one mile beyond property bounderies. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers and other surface water bodies in the map area. See instructions for precise requirements.

**XII. NATURE OF BUSINESS** *(provide a brief description)*

Production and distribution of municipal potable water.

Collection and treatment of municipal wastewater.

**XIII. CERTIFICATION** *(see instructions)*

*I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.*

| A. NAME & OFFICIAL TITLE *(type or print)* | B. SIGNATURE | C. DATE SIGNED |
|---|---|---|
| Herbert J. Johnston, General Manager | | 02-05-01 |

**COMMENTS FOR OFFICIAL USE ONLY**

C

EPA Form 3510-1 (8-90)

ND 1435

FACILITY NAME AND PERMIT NUMBER:

NORTHERN DISTRICT WWTP GU0020141

*Form Approved 1/14/99*
*OMB Number 2040-0086*

FORM 2A NPDES

# NPDES FORM 2A APPLICATION OVERVIEW

## APPLICATION OVERVIEW

Form 2A has been developed in a modular format and consists of a "Basic Application Information" packet and a "Supplemental Application Information" packet. The Basic Application Information packet is divided into two parts. All applicants must complete Parts A and C. Applicants with a design flow greater than or equal to 0.1 mgd must also complete Part B. Some applicants must also complete the Supplemental Application Information packet. The following items explain which parts of Form 2A you must complete.

### BASIC APPLICATION INFORMATION:

A. **Basic Application Information for all Applicants.** All applicants must complete questions A.1 through A.8. A treatment works that discharges effluent to surface waters of the United States must also answer questions A.9 through A.12.

B. **Additional Application Information for Applicants with a Design Flow ≥ 0.1 mgd.** All treatment works that have design flows greater than or equal to 0.1 million gallons per day must complete questions B.1 through B.6.

C. **Certification.** All applicants must complete Part C (Certification).

### SUPPLEMENTAL APPLICATION INFORMATION:

D. **Expanded Effluent Testing Data.** A treatment works that discharges effluent to surface waters of the United States and meets one or more of the following criteria must complete Part D (Expanded Effluent Testing Data):

1. Has a design flow rate greater than or equal to 1 mgd,
2. Is required to have a pretreatment program (or has one in place), or
3. Is otherwise required by the permitting authority to provide the information.

E. **Toxicity Testing Data.** A treatment works that meets one or more of the following criteria must complete Part E (Toxicity Testing Data):

1. Has a design flow rate greater than or equal to 1 mgd,
2. Is required to have a pretreatment program (or has one in place), or
3. Is otherwise required by the permitting authority to submit results of toxicity testing.

F. **Industrial User Discharges and RCRA/CERCLA Wastes.** A treatment works that accepts process wastewater from any significant industrial users (SIUs) or receives RCRA or CERCLA wastes must complete Part F (Industrial User Discharges and RCRA/CERCLA Wastes). SIUs are defined as:

1. All industrial users subject to Categorical Pretreatment Standards under 40 Code of Federal Regulations (CFR) 403.6 and 40 CFR Chapter I, Subchapter N (see instructions); and
2. Any other industrial user that:
   a. Discharges an average of 25,000 gallons per day or more of process wastewater to the treatment works (with certain exclusions); or
   b. Contributes a process wastestream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the treatment plant; or
   c. Is designated as an SIU by the control authority.

G. **Combined Sewer Systems.** A treatment works that has a combined sewer system must complete Part G (Combined Sewer Systems).

**ALL APPLICANTS MUST COMPLETE PART C (CERTIFICATION)**

**FACILITY NAME AND PERMIT NUMBER:**

NORTHERN DISTRICT WWTP GU0020141

*Form Approved 1/14/99*
*OMB Number 2040-0086*

# BASIC APPLICATION INFORMATION

## PART A. BASIC APPLICATION INFORMATION FOR ALL APPLICANTS:

All treatment works must complete questions A.1 through A.8 of this Basic Application Information packet.

**A.1. Facility Information.**

Facility name: NORTHERN DISTRICT WASTEWATER TREATMENT PLANT

Mailing Address: P.O. BOX 3010
HAGATNA, GU 96932

Contact person: Herbert J. Johnston

Title: General Manager

Telephone number: (671) 479-7823

Facility Address (not P.O. Box): Route 34 Harmon Anex, Guam 96912

**A.2. Applicant Information.** If the applicant is different from the above, provide the following:

Applicant name:

Mailing Address:

Contact person:

Title:

Telephone number:

**Is the applicant the owner or operator (or both) of the treatment works?**

X owner X operator

Indicate whether correspondence regarding this permit should be directed to the facility or the applicant.

___ facility X applicant

**A.3. Existing Environmental Permits.** Provide the permit number of any existing environmental permits that have been issued to the treatment works (include state-issued permits).

NPDES GU0020141 PSD

UIC Other

RCRA Other

**A.4. Collection System Information.** Provide information on municipalities and areas served by the facility. Provide the name and population of each entity and, if known, provide information on the type of collection system (combined vs. separate) and its ownership (municipal, private, etc.).

| Name | Population Served | Type of Collection System | Ownership |
|---|---|---|---|
| Dededo & Yigo | 49,850 | Separate | Public |
| Tumon,Barrigada,Mangilao | 18,334 | Separate | Public |
| AndersenAFB,Fineguyan | 8,488 | Separate | Public & Military |
| **Total population served** | 76,672 | | |

**FACILITY NAME AND PERMIT NUMBER:**

NORTHERN DISTRICT WWTP GU0020141

*Form Approved 1/14/99*
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**A.5. Indian Country.**

a. Is the treatment works located in Indian Country?

____ Yes X No

b. Does the treatment works discharge to a receiving water that is either in Indian Countryor that is upstream from (and eventually flows through) Indian Country?

____ Yes X No

**A.6. Flow.** Indicate the design flow rate of the treatment plant (i.e., the wastewater flow rate that the plant was built to handle). Also provide the average daily flow rate and maximum daily flow rate for each of the last three years. Each year's data must be based on a 12-month time period with the 12th month of "this year" occurring no more than three months prior to this application submittal.

a. Design flow rate 12.0 mgd

| | Two Years Ago | Last Year | This Year | |
|---|---|---|---|---|
| b. Annual average daily flow rate | 6.4 | 5.9 | 6.3 | mgd |
| c. Maximum daily flow rate | 6.9 | 7.2 | 8.0 | mgd |

**A.7. Collection System.** Indicate the type(s) of collection system(s) used by the treatment plant. Check all that apply. Also estimate the percent contribution (by miles) of each.

| | | |
|---|---|---|
| X | Separate sanitary sewer | 100 % |
| N/A | Combined storm and sanitary sewer | ____ % |

**A.8. Discharges and Other Disposal Methods.**

a. Does the treatment works discharge effluent to waters ofthe U.S.? X Yes ____ No

If yes, list how many of each of the following types of discharge points the treatment works uses:

| | |
|---|---|
| i. Discharges of treated effluent | 1 |
| ii. Discharges of untreated or partially treated effluent | N/A |
| iii. Combined sewer overflow points | N/A |
| iv. Constructed emergency overflows (prior to theheadworks) | N/A |
| v. Other N/A | |

b. Does the treatment works discharge effluent to basins, ponds, or other surfaceimpoundments that do not have outlets for discharge to waters of the U.S.? ____ Yes X No

If yes, provide the following for each surface impoundment:

Location: ____

Annual average daily volume discharged to surface impoundment(s) ____ mgd

Is discharge ____ continuous or ____ intermittent?

c. Does the treatment works land-apply treated wastewater? ____ Yes X No

If yes, provide the following for each land application site:

Location: ____

Number of acres: ____

Annual average daily volume applied to site: ____ Mgd

Is land application ____ continuous or ____ intermittent?

d. Does the treatment works discharge or transport treated or untreated wastewater to another treatment works? ____ Yes X No

If yes, describe the mean(s) by which the wastewater from the treatment works is discharged or transported to the other treatment works (e.g., tank truck, pipe).

If transport is by a party other than the applicant, provide:

Transporter name: N/A

Mailing Address:

Contact person:

Title:

Telephone number:

For each treatment works that receives this discharge provide the following:

Name: N/A

Mailing Address:

Contact person:

Title:

Telephone number:

If known, provide the NPDES permit number of the treatment works that receives this discharge.

Provide the average daily flow rate from the treatment works into the receiving facility. mgd

e. Does the treatment works discharge or dispose of its wastewater in a manner not included in A.8.a through A.8.d above (e.g., underground percolation, well injection)? ____ Yes X No

If yes, provide the following for each disposal method:

Description of method (including location and size of site(s) if applicable):

Annual daily volume disposed of by this method:

Is disposal through this method ____ continuous or ____ intermittent?

**FACILITY NAME AND PERMIT NUMBER:**

NORTHERN DISTRICT WWTP GU0020141

*Form Approved 1/14/99*
*OMB Number 2040-0086*

**WASTEWATER DISCHARGES**

If you answered "yes" to question A.8.a, complete questions A.9 through A.12 once for each outfall (including bypass points) through which effluent is discharged. Do not include information on combined sewer overflows in this section. If you answered "no" to question A.8.a, go to Part B, "Additional Application Information for Applicants with a Design Flow Greater than or Equal to 0.1mgd."

**A.9. Description of Outfall.**

a. Outfall number 001

b. Location

Tanguissan (City or town, if applicable) 96912 (Zip Code)

Dededo (County) Guam (State)

13DEG 33MIN 7.36SEC (Latitude) 144DEG 48MIN 24.03SEC (Longitude)

c. Distance from shore (if applicable) 2,160 ft.

d. Depth below surface (if applicable) 60 ft.

e. Average daily flow rate 6.2 mgd

f. Does this outfall have either an intermittent or a periodic discharge? ____ Yes X No (go to A.9.g.)

If yes, provide the following information:

Number of times per year discharge occurs: ____

Average duration of each discharge: ____

Average flow per discharge: ____ mgd

Months in which discharge occurs: ____

g. Is outfall equipped with a diffuser? X Yes ____ No

**A.10. Description of Receiving Waters.**

a. Name of receiving water Philippine Sea

b. Name of watershed (if known) N/A

United States Soil Conservation Service 14-digit watershed code (if known): ____

c. Name of State Management/River Basin (if known): N/A

United States Geological Survey 8-digit hydrologic cataloging unit code (if known): ____

d. Critical low flow of receiving stream (if applicable):

acute N/A cfs chronic N/A cfs

e. Total hardness of receiving stream at critical low flow (if applicable): N/A mg/l of $CaCO_3$

FACILITY NAME AND PERMIT NUMBER:

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**A.11. Description of Treatment.**

a. What levels of treatment are provided? Check all that apply.

X Primary ____ Secondary

____ Advanced ____ Other. Describe: ____

b. Indicate the following removal rates (as applicable):

| | | |
|---|---|---|
| Design $BOD_5$ removal or Design $CBOD_5$ removal | 40-60 (BOD) | % |
| Design SS removal | 50-75 | % |
| Design P removal | Not given | % |
| Design N removal | Not given | % |
| Other N/A | | % |

c. What type of disinfection is used for the effluent from this outfall? If disinfection varies by season, please describe.

Chlorine; but no longer in use.No disinfection performed at this plant.

If disinfection is by chlorination, is dechlorination used for this outfall? ____ Yes X No

d. Does the treatment plant have post aeration? ____ Yes X No

**A.12. Effluent Testing Information. All Applicants that discharge to waters of the US must provide effluent testing data for the following parameters. Provide the indicated effluent testing required by the permitting authority for each outfall through which effluent is discharged. Do not include information on combined sewer overflows in this section. All information reported must be based on data collected through analysis conducted using 40 CFR Part 136 methods. In addition, this data must comply with QA/QC requirements of 40 CFR Part 136 and other appropriate QA/QC requirements for standard methods for analytes not addressed by 40 CFR Part 136. At a minimum, effluent testing data must be based on at least three samples and must be no more than four and one-half years apart.**

Outfall number: 001

| PARAMETER | MAXIMUM DAILY VALUE | | AVERAGE DAILY VALUE | | |
|---|---|---|---|---|---|
| | Value | Units | Value | Units | Number of Samples |
| pH (Minimum) | 7.19 | s.u. | | | |
| pH (Maximum) | 7.31 | s.u. | | | |
| Flow Rate | 7.4 | mgd | 6.2 | mgd | 365 |
| Temperature (Winter) | N/S | | N/S | | |
| Temperature (Summer) | N/S | | N/S | | |

* For pH please report a minimum and a maximum daily value

| POLLUTANT | | MAXIMUM DAILY DISCHARGE | | AVERAGE DAILY DISCHARGE | | | ANALYTICAL METHOD | ML / MDL |
|---|---|---|---|---|---|---|---|---|
| | | Conc. | Units | Conc. | Units | Number of Samples | | |
| **CONVENTIONAL AND NONCONVENTIONAL COMPOUNDS.** | | | | | | | | |
| BIOCHEMICAL OXYGEN DEMAND (Report one) | BOD-5 | 163 | mg/L | 140 | mg/L | 36 | Standard | |
| | CBOD-5 | N/S | | N/S | | | | |
| FECAL COLIFORM | | N/S | | N/S | | | | |
| TOTAL SUSPENDED SOLIDS (TSS) | | 154 | mg/L | 120 | mg/L | 36 | Standard | |

**END OF PART A.**

**REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM 2A YOU MUST COMPLETE**

ND 1441

FACILITY NAME AND PERMIT NUMBER:

NORTHERN DISTRICT WWTP GU0020141

*Form Approved 1/14/99*
*OMB Number 2040-0086*

## BASIC APPLICATION INFORMATION

### PART B. ADDITIONAL APPLICATION INFORMATION FOR APPLICANTS WITH A DESIGN FLOW GREATER THAN OR EQUAL TO 0.1 MGD (100,000 gallons per day).

All applicants with a design flow rate ≥ 0.1 mgd must answer questions B.1 through B.6. All others go to Part C (Certification).

**B.1. Inflow and Infiltration.** Estimate the average number of gallons per day that flow into the treatment works from inflow and/or infiltration.

N/A gpd

Briefly explain any steps underway or planned to minimize inflow and infiltration.

_____

_____

**B.2. Topographic Map.** Attach to this application a topographic map of the area extending at least one mile beyond facility property boundaries. This map must show the outline of the facility and the following information. (You may submit more than one map if one map does not show the entire area.)

a. The area surrounding the treatment plant, including all unit processes.

b. The major pipes or other structures through which wastewater enters the treatment works and the pipes or other structures through which treated wastewater is discharged from the treatment plant. Include outfalls from bypass piping, if applicable.

c. Each well where wastewater from the treatment plant is injected underground.

d. Wells, springs, other surface water bodies, and drinking water wells that are: 1) within 1/4 mile of the property boundaries of the treatment works, and 2) listed in public record or otherwise known to the applicant.

e. Any areas where the sewage sludge produced by the treatment works is stored, treated, or disposed.

f. If the treatment works receives waste that is classified as hazardous under the Resource Conservation and Recovery Act (RCRA) by truck, rail, or special pipe, show on the map where that hazardous waste enters the treatment works and where it is treated, stored, and/or disposed.

**B.3. Process Flow Diagram or Schematic.** Provide a diagram showing the processes of the treatment plant, including all bypass piping and all backup power sources or redundancy in the system. Also provide a water balance showing all treatment units, including disinfection (e.g, chlorination and dechlorination). The water balance must show daily average flow rates at influent and discharge points and approximate daily flow rates between treatment units. Include a brief narrative description of the diagram.

**B.4. Operation/Maintenance Performed by Contractor(s).**

Are any operational or maintenance aspects (related to wastewater treatment and effluent quality) of the treatment works the responsibility of a contractor? ___Yes X No

If yes, list the name, address, telephone number, and status of each contractor and describe the contractor's responsibilities (attach additional pages if necessary).

Name: _____

Mailing Address: _____

_____

Telephone Number: _____

Responsibilities of Contractor: _____

**B.5. Scheduled Improvements and Schedules of Implementation.** Provide information on any uncompleted implementation schedule or uncompleted plans for improvements that will affect the wastewater treatment, effluent quality, or design capacity of the treatment works. If the treatment works has several different implementation schedules or is planning several improvements, submit separate responses to question B.5 for each. (If none, go to question B.6.)

a. List the outfall number (assigned in question A.9) for each outfall that is covered by this implementation schedule.

001

b. Indicate whether the planned improvements or implementation schedule are required by local, State, or Federal agencies.

___Yes X No

c If the answer to B.5.b is "Yes," briefly describe, including new maximum daily inflow rate (if applicable).

N/A

d. Provide dates imposed by any compliance schedule or any actual dates ofcompletion for the implementation steps listed below, as applicable. For improvements planned independently of local, State, or Federal agencies, indicate planned or actual completion dates, as applicable. Indicate dates as accurately as possible.

| Implementation Stage | Schedule MM / DD / YYYY | Actual Completion MM / DD / YYYY |
|---|---|---|
| – Begin construction | 10 / 31 / 2001 | / / |
| – End construction | 10 / 31 / 2002 | / / |
| – Begin discharge | 12 / 31 / 2002 | / / |
| – Attain operational level | 01 / 31 / 2003 | / / |

e. Have appropriate permits/clearances concerning other Federal/State requirements been obtained? X Yes ___ No

Describe briefly: Permits for test drilling approved(May 12,2000)
Permit application for construction to be submitted.

**B.6. EFFLUENT TESTING DATA (GREATER THAN 0.1 MGD ONLY).**

Applicants that discharge to waters of the US must provide effluent testing data for the following parameters. Provide the indicated effluent testing required by the permitting authority for each outfall through which effluent is discharged. Do not include information on combined sewer overflows in this section. All information reported must be based on data collected through analysis conducted using 40 CFR Part 136 methods. In addition, this data must comply with QA/QC requirements of 40 CFR Part 136 and other appropriate QA/QC requirements for standard methods foranalytes not addressed by 40 CFR Part 136. At a minimum, effluent testing data must be based on at least three pollutant scans and must be no more than four and one-half years old.

Outfall Number: 001

| POLLUTANT | MAXIMUM DAILY DISCHARGE | | AVERAGE DAILY DISCHARGE | | | ANALYTICAL METHOD | ML / MDL |
|---|---|---|---|---|---|---|---|
| | Conc. | Units | Conc. | Units | Number of Samples | | |
| **CONVENTIONAL AND NONCONVENTIONAL COMPOUNDS.** | | | | | | | |
| AMMONIA (as N) | N/A | | | | | | |
| CHLORINE (TOTAL RESIDUAL, TRC) | N/A | | | | | | |
| DISSOLVED OXYGEN | N/A | | | | | | |
| TOTAL KJELDAHL NITROGEN (TKN) | N/A | | | | | | |
| NITRATE PLUS NITRITE NITROGEN | N/A | | | | | | |
| OIL and GREASE | N/A | | | | | | |
| PHOSPHORUS (Total) | N/A | | | | | | |
| TOTAL DISSOLVED SOLIDS (TDS) | N/A | | | | | | |
| OTHER | N/A | | | | | | |

**END OF PART B.**
**REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM 2A YOU MUST COMPLETE.**

* Priority Pollutant Scan in progress; results will be forwarded upon receipt.

Estimated date: December 2000

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**FACILITY NAME AND PERMIT NUMBER:**

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## BASIC APPLICATION INFORMATION

### PART C. CERTIFICATION

All applicants must complete the Certification Section. Refer to instructions to determine who is an officer for the purposes of this certification. All applicants must complete all applicable sections of Form 2A, as explained in the Application Overview. Indicate below which parts of Form 2A you have completed and are submitting. By signing this certification statement, applicants confirm that they have reviewed Form 2A and have completed all sections that apply to the facility for which this application is submitted.

**Indicate which parts of Form 2A you have completed and are submitting:**

X Basic Application Information packet

Supplemental Application Information packet:

X Part D (Expanded Effluent Testing Data)

* Part E (Toxicity Testing: Biomonitoring Data)

_____ Part F (Industrial User Discharges and RCRA/CERCLA Wastes)

_____ Part G (Combined Sewer Systems)

### ALL APPLICANTS MUST COMPLETE THE FOLLOWING CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name and official title: Herbert J. Johnston, General Manager

Signature: [signature]

Telephone number: (701) 479-7823

Date signed: 02-05-01

Upon request of the permitting authority, you must submit any other information necessary to assess wastewater treatment practices at the treatment works or identify appropriate permitting requirements.

**SEND COMPLETED FORMS TO:**

* Part E requirement will be sent as soon as possible.

FACILITY NAME AND PERMIT NUMBER:

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## SUPPLEMENTAL APPLICATION INFORMATION

### PART D. EXPANDED EFFLUENT TESTING DATA

Refer to the directions on the cover page to determine whether this section applies to the treatment works.

**Effluent Testing: 1.0 mgd and Pretreatment Treatment Works.** If the treatment works has a design flow greater than or equal to 1.0mgd or it has (or is required to have) a pretreatment program, or is otherwise required by the permitting authority to provide the data, then provide effluent testing data for the following pollutants. Provide the indicated effluent testing information and any other information required by the permitting authority for each outfall through which effluent is discharged. Do not include information on combined sewer overflows in this section. All information reported must be based on data collected through analyses conducted using 40 CFR Part 136 methods. In addition, these data must comply with QA/QC requirements of 40 CFR Part 136 and other appropriate QA/QC requirements for standard methods foranalytes not addressed by 40 CFR Part 136. Indicate in the blank rows provided below any data you may have on pollutants not specifically listed in this form. At a minimum,effluent testing data must be based on at least three pollutant scans and must be no more than four and one-half years old.

Outfall number: 001 * Results submitted are from a single Pollutant Scan. (Complete once for eachoutfall discharging effluent to waters of the United States.)

| POLLUTANT | MAXIMUM DAILY DISCHARGE | | | | AVERAGE DAILY DISCHARGE | | | | | ANALYTICAL METHOD | ML/ MDL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Conc. | Units | Mass | Units | Conc. | Units | Mass | Units | Number of Samples | | |
| **METALS (TOTAL RECOVERABLE), CYANIDE, PHENOLS, AND HARDNESS.** | | | | | | | | | | | |
| ANTIMONY | | | | | | | | | | | |
| ARSENIC | | | | | | | | | | | |
| BERYLLIUM | | | | | | | | | | | |
| CADMIUM | | | | | | | | | | | |
| CHROMIUM | | | | | | | | | | | |
| COPPER | | | | | | | | | | | |
| LEAD | | | | | | | | | | | |
| MERCURY | | | | | | | | | | | |
| NICKEL | | | | | | | | | | | |
| SELENIUM | | | | | | | | | | | |
| SILVER | | | | | | | | | | | |
| THALLIUM | | | | | | | | | | | |
| ZINC | | | | | | | | | | | |
| CYANIDE | | | | | | | | | | | |
| TOTAL PHENOLIC COMPOUNDS | | | | | | | | | | | |
| HARDNESS (AS $CaCO_3$) | | | | | | | | | | | |
| Use this space (or a separate sheet) to provide information on other metals requested by the permit writer. | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

Please refer To TAB 6

**FACILITY NAME AND PERMIT NUMBER:**

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Outfall number: _____ (Complete once for eachoutfall discharging effluent to waters of the United States.)

| POLLUTANT | MAXIMUM DAILY DISCHARGE | | | | AVERAGE DAILY DISCHARGE | | | | | ANALYTICAL METHOD | ML/ MDL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Conc. | Units | Mass | Units | Conc. | Units | Mass | Units | Number of Samples | | |
| **VOLATILE ORGANIC COMPOUNDS.** | | | | | | | | | | | |
| ACROLEIN | | | | | | | | | | | |
| ACRYLONITRILE | | | | | | | | | | | |
| BENZENE | | | | | | | | | | | |
| BROMOFORM | | | | | | | | | | | |
| CARBON TETRACHLORIDE | | | | | | | | | | | |
| CLOROBENZENE | | | | | | | | | | | |
| CHLORODIBROMO-METHANE | | | | | | | | | | | |
| CHLOROETHANE | | | | | | | | | | | |
| 2-CHLORO-ETHYLVINYL ETHER | | | | | | | | | | | |
| CHLOROFORM | | | | | | | | | | | |
| DICHLOROBROMO-METHANE | | | | | | | | | | | |
| 1,1-DICHLOROETHANE | | | | | | | | | | | |
| 1,2-DICHLOROETHANE | | | | | | | | | | | |
| TRANS-1,2-DICHLORO-ETHYLENE | | | | | | | | | | | |
| 1,1-DICHLOROETHYLENE | | | | | | | | | | | |
| 1,2-DICHLOROPROPANE | | | | | | | | | | | |
| 1,3-DICHLORO-PROPYLENE | | | | | | | | | | | |
| ETHYLBENZENE | | | | | | | | | | | |
| METHYL BROMIDE | | | | | | | | | | | |
| METHYL CHLORIDE | | | | | | | | | | | |
| METHYLENE CHLORIDE | | | | | | | | | | | |
| 1,2,2-TETRACHLORO-ETHANE | | | | | | | | | | | |
| TETRACHLORO-ETHYLENE | | | | | | | | | | | |
| TOLUENE | | | | | | | | | | | |

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Outfall number: _____ (Complete once for eachoutfall discharging effluent to waters of the United States.)

| POLLUTANT | MAXIMUM DAILY DISCHARGE | | | | AVERAGE DAILY DISCHARGE | | | | | ANALYTICAL METHOD | ML/ MDL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Conc. | Units | Mass | Units | Conc. | Units | Mass | Units | Number of Samples | | |
| 1,1,1-TRICHLOROETHANE | | | | | | | | | | | |
| 1,1,2-TRICHLOROETHANE | | | | | | | | | | | |
| TRICHLORETHYLENE | | | | | | | | | | | |
| VINYL CHLORIDE | | | | | | | | | | | |
| Use this space (or a separate sheet) to provide information on other volatile organic compounds requested by the permit writer. | | | | | | | | | | | |
| | | | | | | | | | | | |
| **ACID-EXTRACTABLE COMPOUNDS** | | | | | | | | | | | |
| P-CHLORO-M-CRESOL | | | | | | | | | | | |
| 2-CHLOROPHENOL | | | | | | | | | | | |
| 2,4-DICHLOROPHENOL | | | | | | | | | | | |
| 2,4-DIMETHYLPHENOL | | | | | | | | | | | |
| 4,6-DINITRO-O-CRESOL | | | | | | | | | | | |
| 2,4-DINITROPHENOL | | | | | | | | | | | |
| 2-NITROPHENOL | | | | | | | | | | | |
| 4-NITROPHENOL | | | | | | | | | | | |
| PENTACHLOROPHENOL | | | | | | | | | | | |
| PHENOL | | | | | | | | | | | |
| 2,4,6-TRICHLOROPHENOL | | | | | | | | | | | |
| Use this space (or a separate sheet) to provide information on other acid-extractable compounds requested by the permit writer. | | | | | | | | | | | |
| | | | | | | | | | | | |
| **BASE-NEUTRAL COMPOUNDS.** | | | | | | | | | | | |
| ACENAPHTHENE | | | | | | | | | | | |
| ACENAPHTHYLENE | | | | | | | | | | | |
| ANTHRACENE | | | | | | | | | | | |
| BENZIDINE | | | | | | | | | | | |
| BENZO(A)ANTHRACENE | | | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BENZO(A)PYRENE | | | | | | | | | | | |

**FACILITY NAME AND PERMIT NUMBER:**

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Outfall number: _____ (Complete once for eachoutfall discharging effluent to waters of the United States.)

| POLLUTANT | MAXIMUM DAILY DISCHARGE | | | | AVERAGE DAILY DISCHARGE | | | | | ANALYTICAL METHOD | ML/ MDL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Conc. | Units | Mass | Units | Conc. | Units | Mass | Units | Number of Samples | | |
| 3,4 BENZO-FLUORANTHENE | | | | | | | | | | | |
| BENZO(GHI)PERYLENE | | | | | | | | | | | |
| BENZO(K)FLUORANTHENE | | | | | | | | | | | |
| BIS (2-CHLOROETHOXY) METHANE | | | | | | | | | | | |
| BIS (2-CHLOROETHYL)-ETHER | | | | | | | | | | | |
| BIS (2-CHLOROISO-PROPYL) ETHER | | | | | | | | | | | |
| BIS (2-ETHYLHEXYL) PHTHALATE | | | | | | | | | | | |
| 4-BROMOPHENYL PHENYL ETHER | | | | | | | | | | | |
| BUTYL BENZYL PHTHALATE | | | | | | | | | | | |
| 2-CHLORONAPHTHALENE | | | | | | | | | | | |
| 4-CHLORPHENYL PHENYL ETHER | | | | | | | | | | | |
| CHRYSENE | | | | | | | | | | | |
| DI-N-BUTYL PHTHALATE | | | | | | | | | | | |
| DI-N-OCTYL PHTHALATE | | | | | | | | | | | |
| DIBENZO(A,H) ANTHRACENE | | | | | | | | | | | |
| 1,2-DICHLOROBENZENE | | | | | | | | | | | |
| 1,3-DICHLOROBENZENE | | | | | | | | | | | |
| 1,4-DICHLOROBENZENE | | | | | | | | | | | |
| 3,3-DICHLOROBENZIDINE | | | | | | | | | | | |
| DIETHYL PHTHALATE | | | | | | | | | | | |
| DIMETHYL PHTHALATE | | | | | | | | | | | |
| 2,4-DINITROTOLUENE | | | | | | | | | | | |
| 2,6-DINITROTOLUENE | | | | | | | | | | | |

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| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,2-DIPHENYLHYDRAZINE | | | | | | | | | | | |

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Outfall number: _____ (Complete once for eachoutfall discharging effluent to waters of the United States.)

| POLLUTANT | MAXIMUM DAILY DISCHARGE | | | | AVERAGE DAILY DISCHARGE | | | | | ANALYTICAL METHOD | ML/MDL |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Conc. | Units | Mass | Units | Conc. | Units | Mass | Units | Number of Samples | | |
| FLUORANTHENE | | | | | | | | | | | |
| FLUORENE | | | | | | | | | | | |
| HEXACHLOROBENZENE | | | | | | | | | | | |
| HEXACHLOROBUTADIENE | | | | | | | | | | | |
| HEXACHLOROCYCLO-PENTADIENE | | | | | | | | | | | |
| HEXACHLOROETHANE | | | | | | | | | | | |
| INDENO(1,2,3-CD)PYRENE | | | | | | | | | | | |
| ISOPHORONE | | | | | | | | | | | |
| NAPHTHALENE | | | | | | | | | | | |
| NITROBENZENE | | | | | | | | | | | |
| N-NITROSODI-N-PROPYLAMINE | | | | | | | | | | | |
| N-NITROSODI- METHYLAMINE | | | | | | | | | | | |
| N-NITROSODI-PHENYLAMINE | | | | | | | | | | | |
| PHENANTHRENE | | | | | | | | | | | |
| PYRENE | | | | | | | | | | | |
| 1,2,4-TRICHLOROBENZENE | | | | | | | | | | | |
| Use this space (or a separate sheet) to provide information on other base-neutral compounds requested by the permit writer. | | | | | | | | | | | |
| | | | | | | | | | | | |
| Use this space (or a separate sheet) to provide information on other pollutants (e.g., pesticides) requested by the permit writer. | | | | | | | | | | | |
| | | | | | | | | | | | |

**END OF PART D.**
**REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM 2A YOU MUST COMPLETE**

**FACILITY NAME AND PERMIT NUMBER:**

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# SUPPLEMENTAL APPLICATION INFORMATION

## PART E. TOXICITY TESTING DATA

POTWs meeting one or more of the following criteria must provide the results of whole effluent toxicity tests for acute or chronic toxicity for each of the facility's discharge point(s): 1) POTWs with a design flow rate greater than or equal to 1.0 mgd; 2) POTWs with approved pretreatment programs or those that are required to have one under 40 CFR Part 403; or 3) POTWs required by the permitting authority to submit data for these parameters.

- At a minimum, these results must include quarterly testing for a 12-month period within the past 1 year using multiple species (minimum of two species), or the results from four tests performed at least annually in the four and one-half years prior to the application, provided the results show no appreciable toxicity, and testing for acute and/or chronic toxicity, depending on the range of receiving water dilution. Do not include information on combined sewer overflows in this section. All information reported must be based on data collected through analysis conducted using 40 CFR Part 136 methods. In addition, this data must comply with QA/QC requirements of 40 CFR Part 136 and other appropriate QA/QC requirements for standard methods for analytes not addressed by 40 CFR Part 136.
- In addition, submit the results of any other whole effluent toxicity tests from the past four and one-half years. If a whole effluent toxicity test conducted during the past four and one-half years revealed toxicity, provide any information on the cause of the toxicity or any results of a toxicity reduction evaluation, if one was conducted.
- If you have already submitted any of the information requested in Part E, you need not submit it again. Rather, provide the information requested in question E.4 for previously submitted information. If EPA methods were not used, report the reasons for using alternate methods. If test summaries are available that contain all of the information requested below, they may be submitted in place of Part E.

If no biomonitoring data is required, do not complete Part E. Refer to the Application Overview for directions on which other sections of the form to complete.

**E.1. Required Tests.**

Indicate the number of whole effluent toxicity tests conducted in the past four and one-half years.

____chronic ____acute

**E.2. Individual Test Data.** Complete the following chart for each whole effluent toxicity test conducted in the last four and one-half years. Allow one column per test (where each species constitutes a test). Copy this page if more than three tests are being reported.

| | Test number:_____ | Test number:_____ | Test number:_____ |
|---|---|---|---|
| **a. Test information.** | | | |
| Test species & test method number | | | |
| Age at initiation of test | | | |
| Outfall number | | | |
| Dates sample collected | | | |
| Date test started | | | |
| Duration | | | |
| **b. Give toxicity test methods followed.** | | | |
| Manual title | | | |
| Edition number and year of publication | | | |
| Page number(s) | | | |
| **c. Give the sample collection method(s) used. For multiple grab samples, indicate the number of grab samples used.** | | | |
| 24-Hour composite | | | |
| Grab | | | |
| **d. Indicate where the sample was taken in relation to disinfection. (Check all that apply for each)** | | | |
| Before disinfection | | | |
| After disinfection | | | |
| After dechlorination | | | |

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| | Test number:_____ | Test number:_____ | Test number:_____ |
|---|---|---|---|
| e. Describe the point in the treatment process at which the sample was collected. | | | |
| Sample was collected: | | | |
| f. For each test, include whether the test was intended to assess chronic toxicity, acute toxicity, or both. | | | |
| Chronic toxicity | | | |
| Acute toxicity | | | |
| g. Provide the type of test performed. | | | |
| Static | | | |
| Static-renewal | | | |
| Flow-through | | | |
| h. Source of dilution water. If laboratory water, specify type; if receiving water, specify source. | | | |
| Laboratory water | | | |
| Receiving water | | | |
| i. Type of dilution water. If salt water, specify "natural" or type of artificial sea salts or brine used. | | | |
| Fresh water | | | |
| Salt water | | | |
| j. Give the percentage effluent used for all concentrations in the test series. | | | |
| | | | |
| | | | |
| | | | |
| k. Parameters measured during the test. (State whether parameter meets test method specifications) | | | |
| pH | | | |
| Salinity | | | |
| Temperature | | | |
| Ammonia | | | |
| Dissolved oxygen | | | |
| l. Test Results. | | | |
| Acute: | | | |
| Percent survival in 100% effluent | % | % | % |
| $LC_{50}$ | | | |
| 95% C.I. | % | % | % |
| Control percent survival | % | % | % |
| Other (describe) | | | |

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| Chronic: | | | |
|---|---|---|---|
| NOEC | % | % | % |
| $IC_{25}$ | % | % | % |
| Control percent survival | % | % | % |
| Other (describe) | | | |

m. Quality Control/Quality Assurance.

| | | | |
|---|---|---|---|
| Is reference toxicant data available? | | | |
| Was reference toxicant test within acceptable bounds? | | | |
| What date was reference toxicant test run (MM/DD/YYYY)? | | | |
| Other (describe) | | | |

**E.3. Toxicity Reduction Evaluation.** Is the treatment works involved in a Toxicity Reduction Evaluation?

____Yes ____No If yes, describe: _____

_____

_____

**E.4. Summary of Submitted Biomonitoring Test Information.** If you have submitted biomonitoring test information, or information regarding the cause of toxicity, within the past four and one-half years, provide the dates the information was submitted to the permitting authority and a summary of the results.

Date submitted: _____ (MM/DD/YYYY)

Summary of results: (see instructions)

_____

_____

**END OF PART E.**
**REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM 2A YOU MUST COMPLETE.**

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# SUPPLEMENTAL APPLICATION INFORMATION

## PART F. INDUSTRIAL USER DISCHARGES AND RCRA/CERCLA WASTES

All treatment works receiving discharges from significant industrial users or which receive RCRA, CERCLA, or other remedial wastes must complete Part F.

### GENERAL INFORMATION:

**F.1. Pretreatment Program.** Does the treatment works have, or is it subject to, an approved pretreatment program?

____Yes ____No

**F.2. Number of Significant Industrial Users (SIUs) and Categorical Industrial Users (CIUs).** Provide the number of each of the following types of industrial users that discharge to the treatment works.

a. Number of non-categorical SIUs. _____

b. Number of CIUs. _____

### SIGNIFICANT INDUSTRIAL USER INFORMATION:

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, copy questions F.3 through F.8 and provide the information requested for each SIU.

**F.3. Significant Industrial User Information.** Provide the name and address of each SIU discharging to the treatment works. Submit additional pages as necessary.

Name: _____

Mailing Address: _____

_____

**F.4. Industrial Processes.** Describe all of the industrial processes that affect or contribute to theSIU's discharge.

_____

**F.5. Principal Product(s) and Raw Material(s).** Describe all of the principal processes and raw materials that affect or contribute to theSIU's discharge.

Principal product(s): _____

Raw material(s): _____

**F.6. Flow Rate.**

a. Process wastewater flow rate. Indicate the averagedaily volume of process wastewater discharged into the collection system in gallons per day (gpd) and whether the discharge is continuous or intermittent.

_____ gpd (_____continuous or _____intermittent)

b. Non-process wastewater flow rate. Indicate the average daily volume of non-process wastewater flow discharged into the collection system in gallons per day (gpd) and whether the discharge is continuous or intermittent.

_____ gpd (_____continuous or _____intermittent)

**F.7. Pretreatment Standards.** Indicate whether the SIU is subject to the following:

a. Local limits ____Yes ____No

b. Categorical pretreatment standards ____Yes ____No

If subject to categorical pretreatment standards, which category and subcategory?

_____

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**F.8. Problems at the Treatment Works Attributed to Waste Discharged by the SIU.** Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?

____Yes ____No If yes, describe each episode.

_____

_____

## RCRA HAZARDOUS WASTE RECEIVED BY TRUCK, RAIL, OR DEDICATED PIPELINE:

**F.9. RCRA Waste.** Does the treatment works receive or has it in the past three years received RCRA hazardous waste by truck, rail, or dedicated pipe?
____Yes ___No (go to F.12.)

**F.10. Waste Transport.** Method by which RCRA waste is received (check all that apply):

_____Truck _____Rail _____Dedicated Pipe

**F.11. Waste Description.** Give EPA hazardous waste number and amount (volume or mass, specify units).

| EPA Hazardous Waste Number | Amount | Units |
|---|---|---|
| | | |
| | | |
| | | |

## CERCLA (SUPERFUND) WASTEWATER, RCRA REMEDIATION/CORRECTIVE ACTION WASTEWATER, AND OTHER REMEDIAL ACTIVITY WASTEWATER:

**F.12. Remediation Waste.** Does the treatment works currently (or has it been notified that it will) receive waste from remedial activities?

____Yes (complete F.13 through F.15.) ____No

Provide a list of sites and the requested information (F.13 - F.15.) for each current and future site.

**F.13. Waste Origin.** Describe the site and type of facility at which the CERCLA/RCRA/or other remedial waste originates (or is expected to originate in the next five years).

_____

_____

_____

**F.14. Pollutants.** List the hazardous constituents that are received (or are expected to be received). Include data on volume and concentration, if known. (Attach additional sheets if necessary).

_____

_____

**F.15. Waste Treatment.**

a. Is this waste treated (or will it be treated) prior to entering the treatment works?

____Yes ____No

If yes, describe the treatment (provide information about the removal efficiency):

_____

_____

b. Is the discharge (or will the discharge be) continuous or intermittent?

____Continuous ____Intermittent If intermittent, describe discharge schedule

**END OF PART F.**
**REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM 2A YOU MUST COMPLETE**

FACILITY NAME AND PERMIT NUMBER:

NORTHERN DISTRICT WWTP GU0020141

*Form Approved 1/14/99*
*OMB Number 2040-0086*

# SUPPLEMENTAL APPLICATION INFORMATION

## PART G. COMBINED SEWER SYSTEMS

If the treatment works has a combined sewer system, complete Part G.

**G.1. System Map.** Provide a map indicating the following: (may be included with Basic Application Information)

a. All CSO discharge points.

b. Sensitive use areas potentially affected by CSOs (e.g., beaches, drinking water supplies, shellfish beds, sensitive aquatic ecosystems, and outstanding natural resource waters).

c. Waters that support threatened and endangered species potentially affected by CSOs.

**G.2. System Diagram.** Provide a diagram, either in the map provided in G.1. or on a separate drawing, of the combined sewer collection system that includes the following information:

a. Locations of major sewer trunk lines, both combined and separate sanitary.

b. Locations of points where separate sanitary sewers feed into the combined sewer system.

c. Locations of in-line and off-line storage structures.

d. Locations of flow-regulating devices.

e. Locations of pump stations.

## CSO OUTFALLS:

Complete questions G.3 through G.6 once for each CSO discharge point.

**G.3. Description of Outfall.**

a. Outfall number _____

b. Location _____
(City or town, if applicable) (Zip Code)

_____
(County) (State)

_____
(Latitude) (Longitude)

c. Distance from shore (if applicable) _____ ft.

d. Depth below surface (if applicable) _____ ft.

e. Which of the following were monitored during the last year for this CSO?

____Rainfall ____CSO pollutant concentrations ____CSO frequency

____CSO flow volume ____Receiving water quality

f. How many storm events were monitored during the last year? _____

**G.4. CSO Events.**

a. Give the number of CSO events in the last year.

_____ events (___ actual or ___ approx.)

b. Give the average duration per CSO event.

_____ hours (____ actual or ____ approx.)

c. Give the average volume per CSO event.

_____ million gallons (_____ actual or _____ approx.)

d. Give the minimum rainfall that caused a CSO event in the last year.

_____ inches of rainfall

**G.5. Description of Receiving Waters.**

a. Name of receiving water: _____

b. Name of watershed/river/stream system: _____

United States Soil Conservation Service 14-digit watershed code (if known): _____

c. Name of State Management/River Basin: _____

United States Geological Survey 8-digit hydrologic cataloging unit code (if known): _____

**G.6. CSO Operations.**

Describe any known water quality impacts on the receiving water caused by this CSO (e.g., permanent or intermittent beach closings, permanent or intermittent shell fish bed closings, fish kills, fish advisories, other recreational loss, or violation of any applicable State water quality standard).

_____

_____

**END OF PART G.**
**REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM 2A YOU MUST COMPLETE.**

Additional information, if provided, will appear on the following pages.

Description of Treatment/Outfall System

(Drawing)

# DRAWING

4

Summary Attachment

**Summary Attachment for Revised 301 (h) Applications for Agana and Northern District WWTP's**

Dissolved Oxygen

Dissolved oxygen (DO) profile surveys for both the Agana and Northern District offshore sites were initiated by Noda and Associates on Nov. 6, 1998 and continued until Nov. 14, 1998. The data shows that dissolved oxygen profiles range throughout the water columns from about 105% to 95% at Agana and about 100% to 96% at the Northern District offshore site. These results were expected as historic DO data showed concentrations near 100% saturation (See Appendix A).

Salinity

Salinity-temperature-depth (STD) profiles were also obtained between Nov. 6, 1998 and Nov. 14, 1998. From this information, density profile data were calculated. In general, the data obtained during the November 1998 field program indicates that the water column at both sites are essentially of uniform density to the 70 meter depth, which was the maximum extent of the profiling. This is a usual situation in Pacific water where the upper mixed layer is usually of the order of 100 meters from the surface. If the density profile data from the Agana and Northern District sites are overlaid together, the data are very similar, which would be expected due to the relatively close proximity between the two sites. Historic reports illustrate similar data that enforces the STD study (See Appendix B).

Currents

A 6-day mooring study was conducted by Noda and Associates in both Agana and Northern Districts. Two current meters were deployed on November 7, 1998, one of which was placed at the 205-foot contour in Agana District located at 13-29.09N Latitude and 144-44.65E Longitude. This meter was set at a sensor depth of 108 feet (33 meters) and at a bottom depth of 200 feet (61 meters). Magnetic declination was set at 1.8 degrees. At the nominal depth of 108 feet of water the sensor moved toward the southwest-southeast at a mean speed of 0.2 feet per second (0.06 m/s). The speed varied from 0.0 to 0.8 foot per second (0.2 m/s).

The second current meter position was set at the 195-foot contour in Northern District located at 13-33.13N Latitude and 144-48.26E Longitude. The nominal depth was located 89 feet (27 meters) deep with a bottom depth of 190 feet (58 meters). Magnetic declination was also set at 1.8 degrees. At a depth of 89 feet of water the meter sensor moved northeasterly-south at a mean speed of 0.3 feet per second (0.08 m/s). Speeds ranged between 0.0 to 1.1 feet per second (0.3 m/s) (See Appendix C). Both meters were retrieved on November 13, 1998.

Waves

Wave and wave climate at the Agana and Northern districts have been addressed by Noda and Associates (See Appendix D). Profiles of typical wind and deepwater wave conditions to be

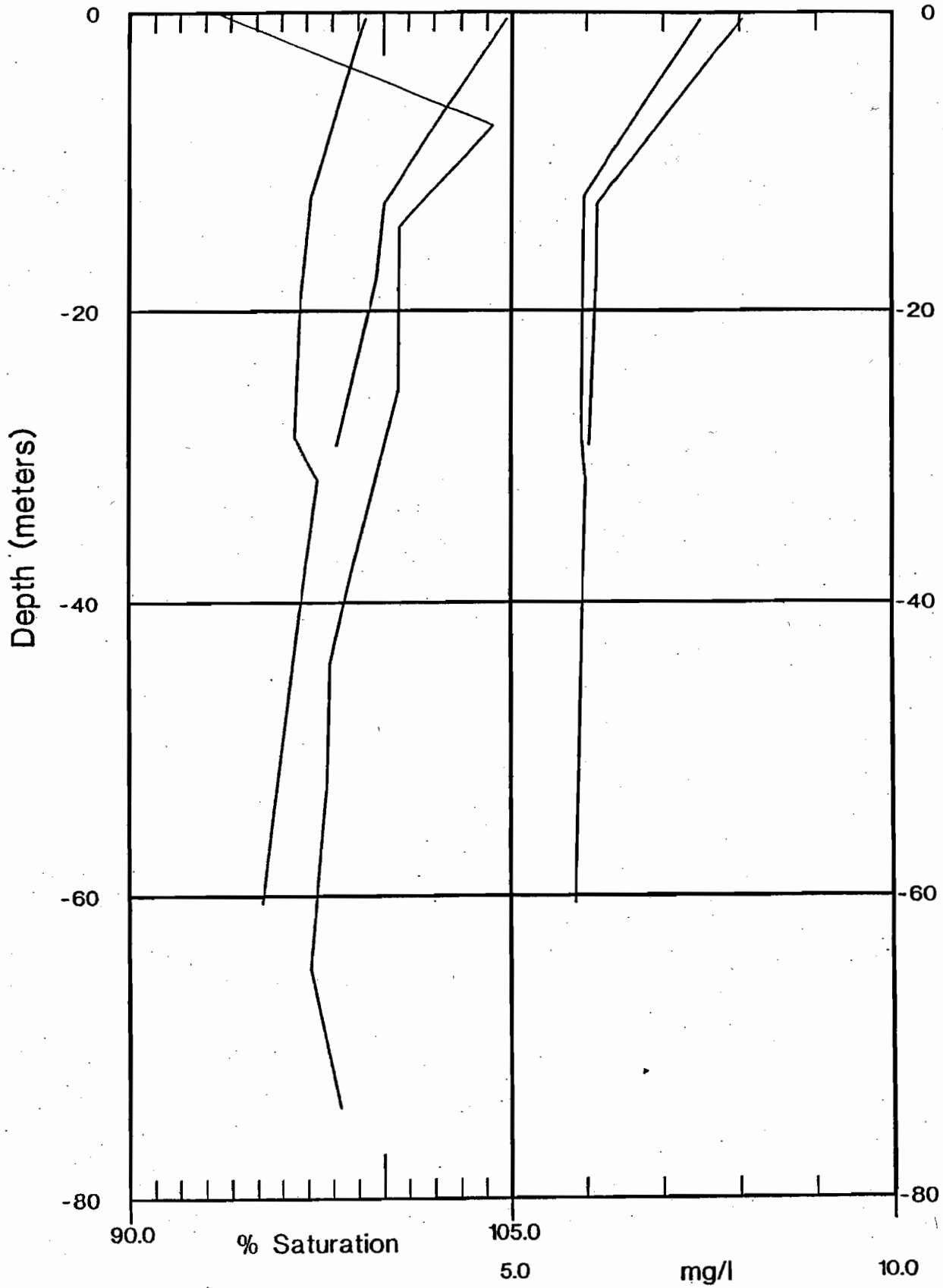
expected at the site was developed from data contained in the Summary of Synoptic Meteorological Observations (SSMO). Preliminary evaluations of monthly typical historic wave conditions at the Agana and Northern District outfall locations showed that May and possibly June are the months with the lowest frequency of wave occurrence. Percent occurrence of wave activity increase significantly in July and continues to increase towards the end of the year.

All major tropical cyclone evens from 1946-1997 which have significantly affected Guam were computer simulated using a moving hurricane model which has been calibrated and verified for Pacific hurricanes and typhoons. The model generates graphical displays of the two-dimensional surface wind field, wave field and wave period fields as well as tabular outputs for a cross-section passing through the maximum winds. The maximum offshore wave conditions were determined from a hindcast analysis of Typhoon Paka 1997. Maximum wave-induced velocity and accelerations as a function of a water depth were developed using Dean's Stream Function Theory for nonlinear waves.

In additon, a wave refraction analysis was performed for each site. A computer wave refraction analysis was performed for periods ranging from 8-16 seconds, and for all possible wave directions. The wave refraction coefficient $K_r$ was determined for each wave period and for various wave approach directions. The refraction model grid area is shown in Appendix D. The bathymetric grid consisted of 15 points in the north-south direction and 28 points in the east-west direction, with a grid size of 250 feet. The refraction analysis was perfomed for the proposed offshore diffuser in Agana at a water depth of approximately 200 feet. The analysis shows that waves approaching from about 350°T through 20°T undergo little or no refraction effects since these waves approach perpendicular to the offshore bottom contours. The refraction analysis was perfomed for the proposed offshore diffuser in Northern District at a water depth of approximately 190 feet. The analysis shows that waves approaching from about 270°T undergo little or no refraction effects since these waves approach perpendicular to the offshore bottom contours. Appendix D includes figures that show the variation of refraction coefficient as a function of deepwater approach direction, for wave periods from 10 to 16 seconds.

# APPENDIX A:

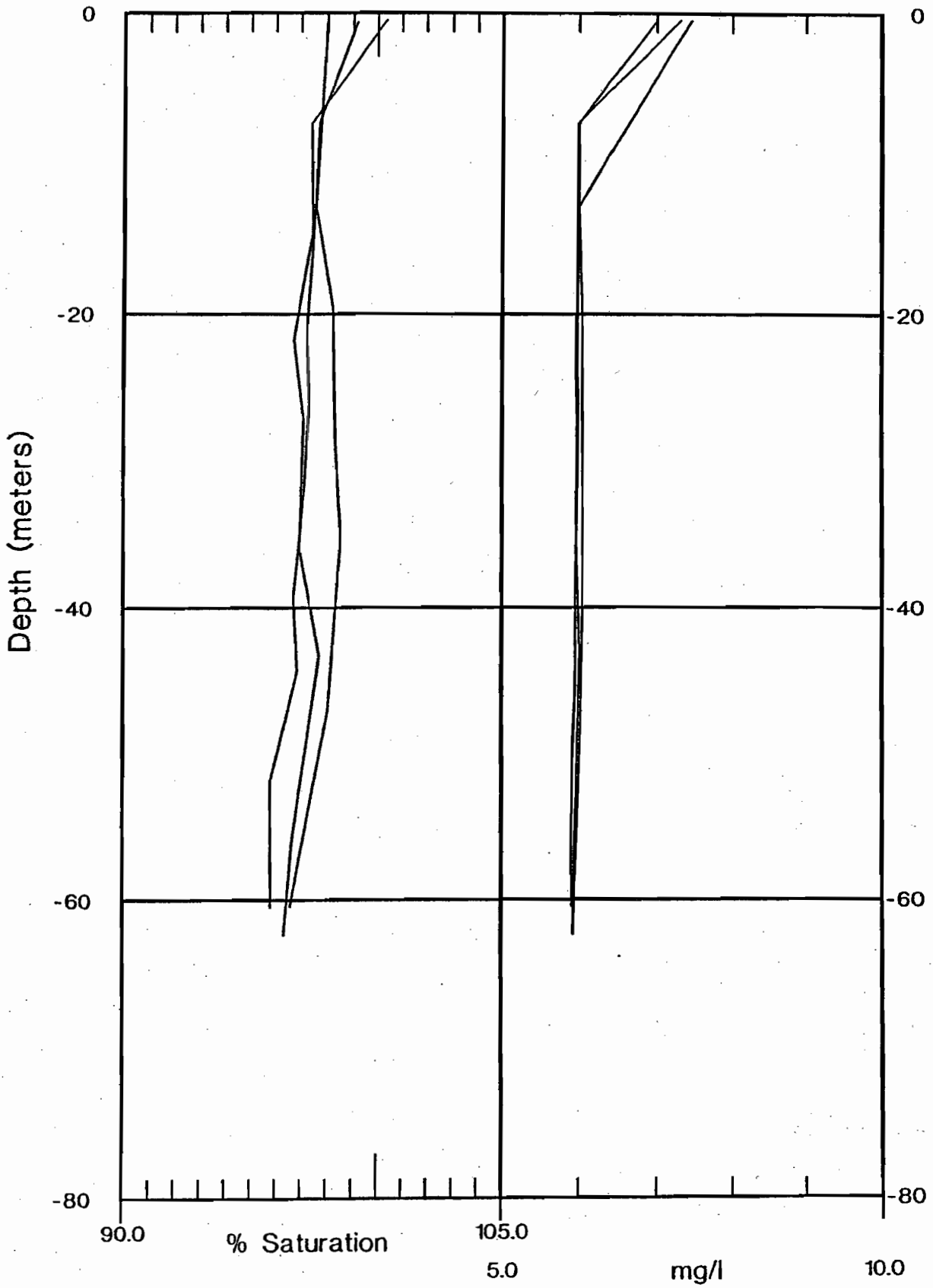
# DISSOLVED OXYGEN PROFILES




DISSOLVED OXYGEN

ND 1463

| | | | |
|---|---|---|---|
| | AGANA SEWAGE TREATMENT | Agana STP | FIGURE |




DISSOLVED OXYGEN

ND 1464

| | | | |
|---|---|---|---|
| Edward K. Noda | NORTHERN DISTRICT SEWAGE TREATMENT | Northern District STP Dissolved Oxygen Profiles | FIGURE |

# APPENDIX B:

# SALINITY-TEMPERATURE-DEPTH PROFILES

AGANA WWTP DISSOLVED OXYGEN (DO) PROFILE DATA OBTAINED
DURING NOV. 6-13, 1998 BY EDWARD K. NODA AND ASSOCIATES, INC.
(Lat. and Long. in WGS 83)

| MONTH | DAY | YEAR | DEPTH (meters) | DO Pct Sat | DO mg/l | TEMP (C) | Cond mS/cm | Turb NTUs | pH | ORP mV | Lat. | Long. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | 6 | 98 | 0.10 | 93.5 | 0.00 | 30.33 | 0.71 | 3 | 7.10 | 290 | 13 29 14.72N | 144 44 41.14E |
| 11 | 6 | 98 | 7.62 | 104.2 | 0.00 | 29.18 | 1.18 | 0 | 8.23 | 348 | 13 29 14.72N | 144 44 41.14E |
| 11 | 6 | 98 | 14.36 | 100.6 | 0.00 | 29.12 | 1.10 | 0 | 8.24 | 333 | 13 29 14.72N | 144 44 41.14E |
| 11 | 6 | 98 | 25.30 | 100.6 | 0.00 | 29.09 | 1.10 | 0 | 8.25 | 327 | 13 29 14.72N | 144 44 41.14E |
| 11 | 6 | 98 | 37.72 | 98.8 | 0.00 | 28.80 | 1.02 | 0 | 8.25 | 324 | 13 29 14.72N | 144 44 41.14E |
| 11 | 6 | 98 | 44.12 | 97.9 | 0.00 | 28.76 | 1.06 | 0 | 8.25 | 323 | 13 29 14.72N | 144 44 41.14E |
| 11 | 6 | 98 | 52.68 | 97.8 | 0.00 | 28.69 | 1.10 | 0 | 8.25 | 322 | 13 29 14.72N | 144 44 41.14E |
| 11 | 6 | 98 | 58.33 | 97.5 | 0.00 | 28.69 | 1.10 | 0 | 8.25 | 321 | 13 29 14.72N | 144 44 41.14E |
| 11 | 6 | 98 | 64.96 | 97.1 | 0.00 | 28.64 | 0.78 | 0 | 8.25 | 321 | 13 29 14.72N | 144 44 41.14E |
| 11 | 6 | 98 | 74.13 | 98.3 | 0.00 | 28.29 | 1.05 | 0 | 8.25 | 320 | 13 29 14.72N | 144 44 41.14E |
| 11 | 12 | 98 | 0.40 | 104.8 | 8.04 | 28.36 | 0.00 | 0 | 7.94 | 252 | 13 29 14.19N | 144 44 43.04E |
| 11 | 12 | 98 | 12.81 | 100.0 | 6.15 | 29.08 | 2.76 | 0 | 8.16 | 208 | 13 29 14.19N | 144 44 43.04E |
| 11 | 12 | 98 | 17.84 | 99.7 | 6.13 | 29.07 | 2.73 | 0 | 8.17 | 213 | 13 29 14.19N | 144 44 43.04E |
| 11 | 12 | 98 | 29.24 | 98.2 | 6.04 | 29.06 | 2.78 | 0 | 8.17 | 234 | 13 29 14.19N | 144 44 43.04E |
| 11 | 13 | 98 | 0.41 | 99.3 | 7.50 | 28.36 | 4.92 | 10 | 7.86 | 283 | 13 29 13.51N | 144 44 54.85E |
| 11 | 13 | 98 | 12.30 | 97.2 | 5.98 | 29.07 | 2.80 | 0 | 8.18 | 247 | 13 29 13.51N | 144 44 54.85E |
| 11 | 13 | 98 | 18.96 | 96.8 | 5.95 | 29.05 | 2.79 | 0 | 8.18 | 251 | 13 29 13.51N | 144 44 54.85E |
| 11 | 13 | 98 | 28.59 | 96.5 | 5.94 | 29.05 | 2.80 | 0 | 8.18 | 254 | 13 29 13.51N | 144 44 54.85E |
| 11 | 13 | 98 | 31.59 | 97.4 | 5.99 | 29.05 | 2.80 | 0 | 8.18 | 258 | 13 29 13.51N | 144 44 54.85E |
| 11 | 13 | 98 | 60.55 | 95.2 | 5.86 | 29.04 | 2.80 | 0 | 8.18 | 266 | 13 29 13.51N | 144 44 54.85E |

# AGA WWTP DIFFUSER SITE DENSITY DATA

| MONTH | DEPTH (meters) | DENSITY gm/cm^3 | TEMP (C) | SAL 0/00 | DAY | YEAR | DATA SOURCE | STATION |
|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 1.02140 | 28.8 | 34.0 | 7 | 82 | Gov. of Guam, Water Quality Data | AGMX |
| 1 | 3 | 1.02150 | 28.5 | 34.0 | 7 | 82 | Gov. of Guam, Water Quality Data | AGMX |
| 1 | 0 | 1.02137 | 28.9 | 34.0 | 7 | 82 | Gov. of Guam, Water Quality Data | AGMX1 |
| 1 | 3 | 1.02150 | 28.5 | 34.0 | 7 | 82 | Gov. of Guam, Water Quality Data | AGMX1 |
| 1 | 6 | 1.02154 | 28.4 | 34.0 | 7 | 82 | Gov. of Guam, Water Quality Data | AGMX1 |
| 1 | 0 | 1.02137 | 28.9 | 34.0 | 7 | 82 | Gov. of Guam, Water Quality Data | AGMX2 |
| 1 | 3 | 1.02150 | 28.5 | 34.0 | 7 | 82 | Gov. of Guam, Water Quality Data | AGMX2 |
| 1 | 6 | 1.02154 | 28.4 | 34.0 | 7 | 82 | Gov. of Guam, Water Quality Data | AGMX2 |
| 1 | 0 | 1.02154 | 28.4 | 34.0 | 7 | 86 | Gov. of Guam, Water Quality Data | AGMX |
| 1 | 10 | 1.02154 | 28.4 | 34.0 | 7 | 86 | Gov. of Guam, Water Quality Data | AGMX |
| 1 | 20 | 1.02191 | 28.4 | 34.5 | 7 | 86 | Gov. of Guam, Water Quality Data | AGMX |
| 2 | 0 | 1.02215 | 26.5 | 34.0 | 4 | 82 | Gov. of Guam, Water Quality Data | AGMX |
| 2 | 3 | 1.02290 | 26.5 | 35.0 | 4 | 82 | Gov. of Guam, Water Quality Data | AGMX |
| 2 | 6 | 1.02296 | 26.3 | 35.0 | 4 | 82 | Gov. of Guam, Water Quality Data | AGMX |
| 2 | 0 | 1.02218 | 26.4 | 34.0 | 4 | 82 | Gov. of Guam, Water Quality Data | AGMX1 |
| 2 | 3 | 1.02293 | 26.4 | 35.0 | 4 | 82 | Gov. of Guam, Water Quality Data | AGMX1 |
| 2 | 6 | 1.02293 | 26.4 | 35.0 | 4 | 82 | Gov. of Guam, Water Quality Data | AGMX1 |
| 2 | 0 | 1.02293 | 26.4 | 35.0 | 4 | 82 | Gov. of Guam, Water Quality Data | AGMX2 |
| 2 | 3 | 1.02293 | 26.4 | 35.0 | 4 | 82 | Gov. of Guam, Water Quality Data | AGMX2 |
| 2 | 6 | 1.02221 | 26.3 | 34.0 | 4 | 82 | Gov. of Guam, Water Quality Data | AGMX2 |
| 2 | 0 | 1.02290 | 26.5 | 35.0 | 1 | 83 | Gov. of Guam, Water Quality Data | AGMX |
| 2 | 3 | 1.02290 | 26.5 | 35.0 | 1 | 83 | Gov. of Guam, Water Quality Data | AGMX |
| 2 | 6 | 1.02290 | 26.5 | 35.0 | 1 | 83 | Gov. of Guam, Water Quality Data | AGMX |
| 3 | 0 | 1.02183 | 27.5 | 34.0 | 5 | 81 | Gov. of Guam, Water Quality Data | AGMX |
| 3 | 3 | 1.02023 | 27.8 | 32.0 | 5 | 81 | Gov. of Guam, Water Quality Data | AGMX |
| 3 | 6 | 1.02020 | 27.9 | 32.0 | 5 | 81 | Gov. of Guam, Water Quality Data | AGMX |
| 3 | 0 | 1.02180 | 27.6 | 34.0 | 5 | 81 | Gov. of Guam, Water Quality Data | AGMX2 |
| 3 | 3 | 1.02186 | 27.4 | 34.0 | 5 | 81 | Gov. of Guam, Water Quality Data | AGMX2 |
| 3 | 6 | 1.02196 | 27.1 | 34.0 | 5 | 81 | Gov. of Guam, Water Quality Data | AGMX2 |
| 3 | 0 | 1.02167 | 28.0 | 34.0 | 4 | 82 | Gov. of Guam, Water Quality Data | AGMX |
| 3 | 3 | 1.02248 | 27.8 | 35.0 | 4 | 82 | Gov. of Guam, Water Quality Data | AGMX |
| 3 | 6 | 1.02173 | 27.8 | 34.0 | 4 | 82 | Gov. of Guam, Water Quality Data | AGMX |
| 3 | 0 | 1.02235 | 28.2 | 35.0 | 4 | 82 | Gov. of Guam, Water Quality Data | AGMX1 |
| 3 | 3 | 1.02258 | 27.5 | 35.0 | 4 | 82 | Gov. of Guam, Water Quality Data | AGMX1 |
| 3 | 6 | 1.02258 | 27.5 | 35.0 | 4 | 82 | Gov. of Guam, Water Quality Data | AGMX1 |
| 3 | 0 | 1.02242 | 28.0 | 35.0 | 4 | 82 | Gov. of Guam, Water Quality Data | AGMX2 |
| 3 | 3 | 1.02245 | 27.9 | 35.0 | 4 | 82 | Gov. of Guam, Water Quality Data | AGMX2 |
| 3 | 6 | 1.02252 | 27.7 | 35.0 | 4 | 82 | Gov. of Guam, Water Quality Data | AGMX2 |
| 3 | 0 | 1.02274 | 27.0 | 35.0 | 1 | 83 | Gov. of Guam, Water Quality Data | AGMX |
| 3 | 3 | 1.02281 | 26.8 | 35.0 | 1 | 83 | Gov. of Guam, Water Quality Data | AGMX |
| 3 | 6 | 1.02281 | 26.8 | 35.0 | 1 | 83 | Gov. of Guam, Water Quality Data | AGMX |
| 4 | 0 | 1.02180 | 27.6 | 34.0 | 8 | 81 | Gov. of Guam, Water Quality Data | AGMX |
| 4 | 3 | 1.02258 | 27.5 | 35.0 | 8 | 81 | Gov. of Guam, Water Quality Data | AGMX |
| 4 | 6 | 1.02258 | 27.5 | 35.0 | 8 | 81 | Gov. of Guam, Water Quality Data | AGMX |
| 4 | 0 | 1.02183 | 27.5 | 34.0 | 8 | 81 | Gov. of Guam, Water Quality Data | AGMX1 |
| 4 | 3 | 1.02183 | 27.5 | 34.0 | 8 | 81 | Gov. of Guam, Water Quality Data | AGMX1 |
| 4 | 6 | 1.02274 | 27.0 | 35.0 | 8 | 81 | Gov. of Guam, Water Quality Data | AGMX1 |
| 4 | 0 | 1.02177 | 27.7 | 34.0 | 8 | 81 | Gov. of Guam, Water Quality Data | AGMX2 |

| MONTH | DEPTH (meters) | DENSITY gm/cm^3 | TEMP C) | SAL 0/00 | DAY | YEAR | DATA SOURCE | STATION |
|---|---|---|---|---|---|---|---|---|
| 4 | 3 | 1.02258 | 27.5 | 35.0 | 8 | 81 | Gov. of Guam, Water Quality Data | AGMX2 |
| 4 | 6 | 1.02274 | 27.0 | 35.0 | 8 | 81 | Gov. of Guam, Water Quality Data | AGMX2 |
| 4 | 0 | 1.02242 | 28.0 | 35.0 | 13 | 82 | Gov. of Guam, Water Quality Data | AGMX |
| 4 | 3 | 1.02248 | 27.8 | 35.0 | 13 | 82 | Gov. of Guam, Water Quality Data | AGMX |
| 4 | 6 | 1.02258 | 27.5 | 35.0 | 13 | 82 | Gov. of Guam, Water Quality Data | AGMX |
| 4 | 0 | 1.02170 | 27.9 | 34.0 | 13 | 82 | Gov. of Guam, Water Quality Data | AGMX1 |
| 4 | 3 | 1.02255 | 27.6 | 35.0 | 13 | 82 | Gov. of Guam, Water Quality Data | AGMX1 |
| 4 | 6 | 1.02255 | 27.6 | 35.0 | 13 | 82 | Gov. of Guam, Water Quality Data | AGMX1 |
| 4 | 0 | 1.02248 | 27.8 | 35.0 | 13 | 82 | Gov. of Guam, Water Quality Data | AGMX2 |
| 4 | 3 | 1.02255 | 27.6 | 35.0 | 13 | 82 | Gov. of Guam, Water Quality Data | AGMX2 |
| 4 | 6 | 1.02180 | 27.6 | 34.0 | 13 | 82 | Gov. of Guam, Water Quality Data | AGMX2 |
| 4 | 0 | 1.02281 | 26.8 | 35.0 | 7 | 83 | Gov. of Guam, Water Quality Data | AGMX1 |
| 4 | 3 | 1.02281 | 26.8 | 35.0 | 7 | 83 | Gov. of Guam, Water Quality Data | AGMX1 |
| 4 | 6 | 1.02281 | 26.8 | 35.0 | 7 | 83 | Gov. of Guam, Water Quality Data | AGMX1 |
| 4 | 0 | 1.02281 | 26.8 | 35.0 | 7 | 83 | Gov. of Guam, Water Quality Data | AGMX2 |
| 4 | 3 | 1.02281 | 26.8 | 35.0 | 7 | 83 | Gov. of Guam, Water Quality Data | AGMX2 |
| 4 | 6 | 1.02281 | 26.8 | 35.0 | 7 | 83 | Gov. of Guam, Water Quality Data | AGMX2 |
| 4 | 0 | 1.02258 | 27.5 | 35.0 | 4 | 85 | Gov. of Guam, Water Quality Data | AGMX |
| 4 | 10 | 1.02258 | 27.5 | 35.0 | 4 | 85 | Gov. of Guam, Water Quality Data | AGMX |
| 4 | 20 | 1.02258 | 27.5 | 35.0 | 4 | 85 | Gov. of Guam, Water Quality Data | AGMX |
| 4 | 0 | 1.02185 | 28.6 | 34.5 | 3 | 86 | Gov. of Guam, Water Quality Data | AGMX |
| 4 | 10 | 1.02171 | 29.0 | 34.5 | 3 | 86 | Gov. of Guam, Water Quality Data | AGMX |
| 4 | 20 | 1.02171 | 29.0 | 34.5 | 3 | 86 | Gov. of Guam, Water Quality Data | AGMX |
| 4 | 0 | 1.02175 | 28.9 | 34.5 | 3 | 86 | Gov. of Guam, Water Quality Data | AGMX1 |
| 4 | 10 | 1.02175 | 28.9 | 34.5 | 3 | 86 | Gov. of Guam, Water Quality Data | AGMX1 |
| 4 | 20 | 1.02175 | 28.9 | 34.5 | 3 | 86 | Gov. of Guam, Water Quality Data | AGMX1 |
| 4 | 0 | 1.02212 | 28.9 | 35.0 | 3 | 86 | Gov. of Guam, Water Quality Data | AGMX2 |
| 4 | 10 | 1.02212 | 28.9 | 35.0 | 3 | 86 | Gov. of Guam, Water Quality Data | AGMX2 |
| 4 | 20 | 1.02212 | 28.9 | 35.0 | 3 | 86 | Gov. of Guam, Water Quality Data | AGMX2 |
| 4 | 0 | 1.02173 | 27.8 | 34.0 | 9 | 87 | Gov. of Guam, Water Quality Data | AGMX |
| 4 | 10 | 1.02167 | 28.0 | 34.0 | 9 | 87 | Gov. of Guam, Water Quality Data | AGMX |
| 4 | 20 | 1.02167 | 28.0 | 34.0 | 9 | 87 | Gov. of Guam, Water Quality Data | AGMX |
| 4 | 0 | 1.02000 | 28.5 | 32.0 | 6 | 89 | Gov. of Guam, Water Quality Data | AGMX |
| 4 | 10 | 1.02225 | 28.5 | 35.0 | 6 | 89 | Gov. of Guam, Water Quality Data | AGMX |
| 4 | 20 | 1.02225 | 28.5 | 35.0 | 6 | 89 | Gov. of Guam, Water Quality Data | AGMX |
| 4 | 0 | 1.02225 | 28.5 | 35.0 | 6 | 89 | Gov. of Guam, Water Quality Data | AGMX1 |
| 4 | 10 | 1.02225 | 28.5 | 35.0 | 6 | 89 | Gov. of Guam, Water Quality Data | AGMX1 |
| 4 | 20 | 1.02225 | 28.5 | 35.0 | 6 | 89 | Gov. of Guam, Water Quality Data | AGMX1 |
| 4 | 0 | 1.02155 | 27.2 | 33.5 | 25 | 89 | Matson, A.E. (1990) | E |
| 4 | 5 | 1.02151 | 27.1 | 33.4 | 25 | 89 | Matson, A.E. (1990) | E |
| 4 | 10 | 1.02136 | 27.1 | 33.2 | 25 | 89 | Matson, A.E. (1990) | E |
| 4 | 0 | 1.02169 | 27.0 | 33.6 | 25 | 89 | Matson, A.E. (1990) | F |
| 4 | 5 | 1.02161 | 27.0 | 33.5 | 25 | 89 | Matson, A.E. (1990) | F |
| 4 | 10 | 1.02157 | 26.9 | 33.4 | 25 | 89 | Matson, A.E. (1990) | F |
| 4 | 0 | 1.02183 | 27.5 | 34.0 | 5 | 90 | Gov. of Guam, Water Quality Data | AGMX |
| 4 | 10 | 1.02183 | 27.5 | 34.0 | 5 | 90 | Gov. of Guam, Water Quality Data | AGMX |
| 4 | 20 | 1.02183 | 27.5 | 34.0 | 5 | 90 | Gov. of Guam, Water Quality Data | AGMX |
| 5 | 0 | 1.02160 | 28.2 | 34.0 | 5 | 81 | Gov. of Guam, Water Quality Data | AGMX |
| 5 | 3 | 1.02167 | 28.0 | 34.0 | 5 | 81 | Gov. of Guam, Water Quality Data | AGMX |
| 5 | 6 | 1.02167 | 28.0 | 34.0 | 5 | 81 | Gov. of Guam, Water Quality Data | AGMX |

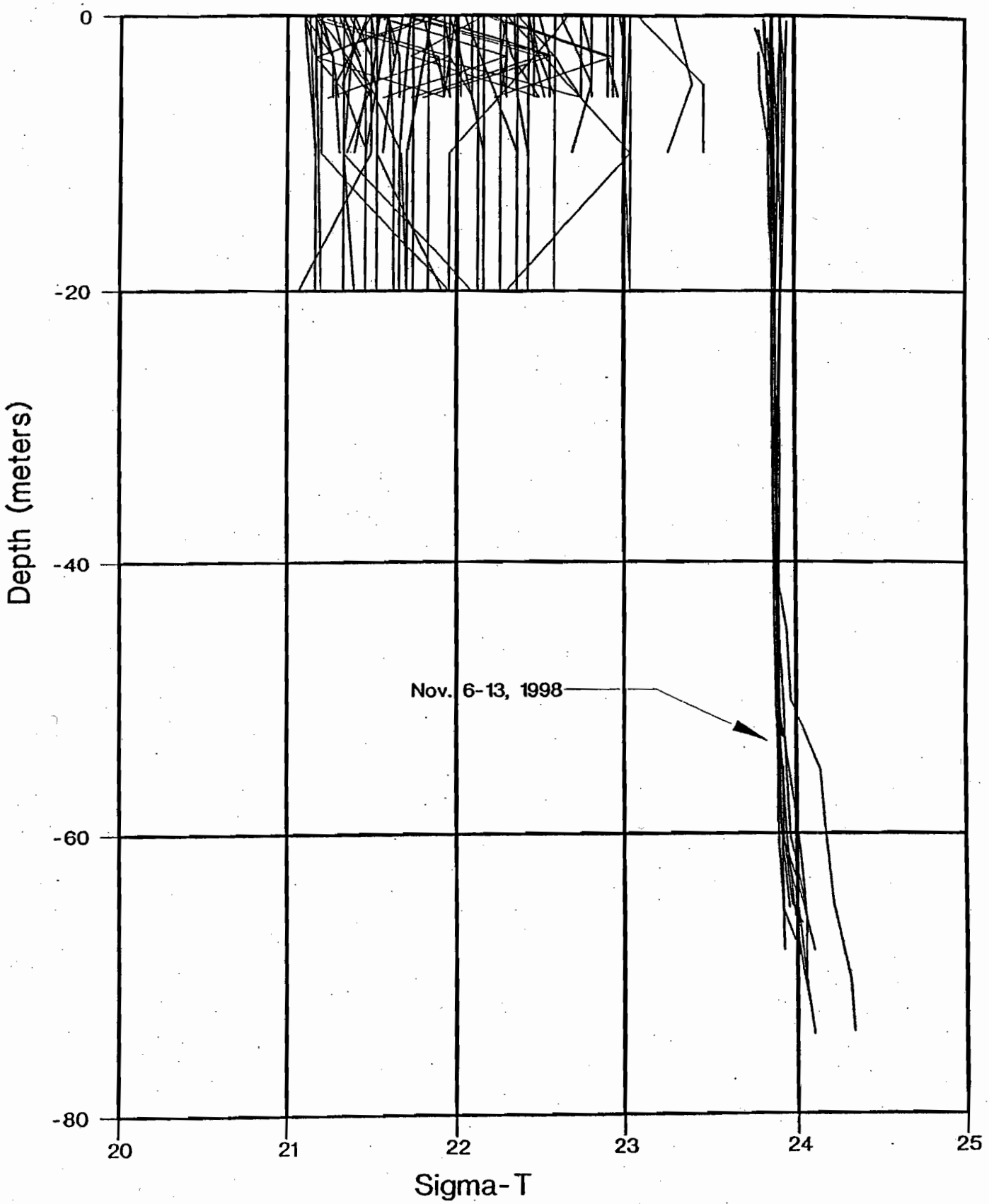
| MONTH | DEPTH (meters) | DENSITY gm/cm^3 | TEMP .C) | SAL 0/00 | DAY | YEAR | DATA SOURCE | STATION |
|---|---|---|---|---|---|---|---|---|
| 5 | 0 | 1.02160 | 28.2 | 34.0 | 5 | 81 | Gov. of Guam, Water Quality Data | AGMX1 |
| 5 | 3 | 1.02164 | 28.1 | 34.0 | 5 | 81 | Gov. of Guam, Water Quality Data | AGMX1 |
| 5 | 0 | 1.02225 | 28.5 | 35.0 | 6 | 82 | Gov. of Guam, Water Quality Data | AGMX |
| 5 | 3 | 1.02232 | 28.3 | 35.0 | 6 | 82 | Gov. of Guam, Water Quality Data | AGMX |
| 5 | 6 | 1.02248 | 27.8 | 35.0 | 6 | 82 | Gov. of Guam, Water Quality Data | AGMX |
| 5 | 0 | 1.02274 | 27.0 | 35.0 | 5 | 83 | Gov. of Guam, Water Quality Data | AGMX |
| 5 | 3 | 1.02274 | 27.0 | 35.0 | 5 | 83 | Gov. of Guam, Water Quality Data | AGMX |
| 5 | 6 | 1.02274 | 27.0 | 35.0 | 5 | 83 | Gov. of Guam, Water Quality Data | AGMX |
| 5 | 0 | 1.02242 | 28.0 | 35.0 | 9 | 85 | Gov. of Guam, Water Quality Data | AGMX |
| 5 | 10 | 1.02242 | 28.0 | 35.0 | 9 | 85 | Gov. of Guam, Water Quality Data | AGMX |
| 5 | 20 | 1.02242 | 28.0 | 35.0 | 9 | 85 | Gov. of Guam, Water Quality Data | AGMX |
| 5 | 0 | 1.02204 | 28.0 | 34.5 | 1 | 86 | Gov. of Guam, Water Quality Data | AGMX |
| 5 | 10 | 1.02235 | 28.2 | 35.0 | 1 | 86 | Gov. of Guam, Water Quality Data | AGMX |
| 5 | 20 | 1.02235 | 28.2 | 35.0 | 1 | 86 | Gov. of Guam, Water Quality Data | AGMX |
| 5 | 0 | 1.02229 | 28.4 | 35.0 | 4 | 89 | Gov. of Guam, Water Quality Data | AGMX |
| 5 | 10 | 1.02304 | 28.4 | 36.0 | 4 | 89 | Gov. of Guam, Water Quality Data | AGMX |
| 5 | 20 | 1.02229 | 28.4 | 35.0 | 4 | 89 | Gov. of Guam, Water Quality Data | AGMX |
| 5 | 0 | 1.02304 | 28.4 | 36.0 | 4 | 89 | Gov. of Guam, Water Quality Data | AGMX1 |
| 5 | 10 | 1.02301 | 28.5 | 36.0 | 4 | 89 | Gov. of Guam, Water Quality Data | AGMX1 |
| 5 | 20 | 1.02304 | 28.4 | 36.0 | 4 | 89 | Gov. of Guam, Water Quality Data | AGMX1 |
| 5 | 0 | 1.02304 | 28.4 | 36.0 | 4 | 89 | Gov. of Guam, Water Quality Data | AGMX2 |
| 5 | 10 | 1.02304 | 28.4 | 36.0 | 4 | 89 | Gov. of Guam, Water Quality Data | AGMX2 |
| 5 | 20 | 1.02304 | 28.4 | 36.0 | 4 | 89 | Gov. of Guam, Water Quality Data | AGMX2 |
| 5 | 0 | 1.02160 | 28.2 | 34.0 | 3 | 90 | Gov. of Guam, Water Quality Data | AGMX |
| 5 | 10 | 1.02164 | 28.1 | 34.0 | 3 | 90 | Gov. of Guam, Water Quality Data | AGMX |
| 5 | 20 | 1.02164 | 28.1 | 34.0 | 3 | 90 | Gov. of Guam, Water Quality Data | AGMX |
| 5 | 0 | 1.02154 | 28.4 | 34.0 | 21 | 97 | Gov. of Guam, Water Drogue Study | AGMX |
| 5 | 10 | 1.02154 | 28.4 | 34.0 | 21 | 97 | Gov. of Guam, Water Drogue Study | AGMX |
| 5 | 20 | 1.02154 | 28.4 | 34.0 | 21 | 97 | Gov. of Guam, Water Drogue Study | AGMX |
| 5 | 0 | 1.02160 | 28.2 | 34.0 | 21 | 97 | Gov. of Guam, Water Drogue Study | AGMX1 |
| 5 | 10 | 1.02147 | 28.6 | 34.0 | 21 | 97 | Gov. of Guam, Water Drogue Study | AGMX1 |
| 5 | 0 | 1.02140 | 28.8 | 34.0 | 21 | 97 | Gov. of Guam, Water Drogue Study | AGMX2 |
| 5 | 10 | 1.02134 | 29.0 | 34.0 | 21 | 97 | Gov. of Guam, Water Drogue Study | AGMX2 |
| 5 | 20 | 1.02140 | 28.8 | 34.0 | 21 | 97 | Gov. of Guam, Water Drogue Study | AGMX2 |
| 6 | 0 | 1.02154 | 28.4 | 34.0 | 4 | 81 | Gov. of Guam, Water Quality Data | AGMX |
| 6 | 3 | 1.02229 | 28.4 | 35.0 | 4 | 81 | Gov. of Guam, Water Quality Data | AGMX |
| 6 | 6 | 1.02225 | 28.5 | 35.0 | 4 | 81 | Gov. of Guam, Water Quality Data | AGMX |
| 6 | 0 | 1.02150 | 28.5 | 34.0 | 4 | 81 | Gov. of Guam, Water Quality Data | AGMX1 |
| 6 | 3 | 1.02154 | 28.4 | 34.0 | 4 | 81 | Gov. of Guam, Water Quality Data | AGMX1 |
| 6 | 6 | 1.02154 | 28.4 | 34.0 | 4 | 81 | Gov. of Guam, Water Quality Data | AGMX1 |
| 6 | 0 | 1.02150 | 28.5 | 34.0 | 4 | 81 | Gov. of Guam, Water Quality Data | AGMX2 |
| 6 | 3 | 1.02229 | 28.4 | 35.0 | 4 | 81 | Gov. of Guam, Water Quality Data | AGMX2 |
| 6 | 6 | 1.02157 | 28.3 | 34.0 | 4 | 81 | Gov. of Guam, Water Quality Data | AGMX2 |
| 6 | 0 | 1.02242 | 28.0 | 35.0 | 8 | 82 | Gov. of Guam, Water Quality Data | AGMX |
| 6 | 3 | 1.02242 | 28.0 | 35.0 | 8 | 82 | Gov. of Guam, Water Quality Data | AGMX |
| 6 | 6 | 1.02242 | 28.0 | 35.0 | 8 | 82 | Gov. of Guam, Water Quality Data | AGMX |
| 6 | 0 | 1.02245 | 27.9 | 35.0 | 7 | 83 | Gov. of Guam, Water Quality Data | AGMX |
| 6 | 3 | 1.02245 | 27.9 | 35.0 | 7 | 83 | Gov. of Guam, Water Quality Data | AGMX |
| 6 | 6 | 1.02245 | 27.9 | 35.0 | 7 | 83 | Gov. of Guam, Water Quality Data | AGMX |
| 6 | 0 | 1.02245 | 27.9 | 35.0 | 7 | 83 | Gov. of Guam, Water Quality Data | AGMX1 |

| MONTH | DEPTH (meters) | DENSITY gm/cm^3 | TP C) | SAL 0/00 | DAY | YEAR | DATA SOURCE | STATION |
|---|---|---|---|---|---|---|---|---|
| 6 | 3 | 1.02245 | 27.9 | 35.0 | 7 | 83 | Gov. of Guam, Water Quality Data | AGMX1 |
| 6 | 6 | 1.02245 | 27.9 | 35.0 | 7 | 83 | Gov. of Guam, Water Quality Data | AGMX1 |
| 6 | 0 | 1.02245 | 27.9 | 35.0 | 7 | 83 | Gov. of Guam, Water Quality Data | AGMX2 |
| 6 | 3 | 1.02245 | 27.9 | 35.0 | 7 | 83 | Gov. of Guam, Water Quality Data | AGMX2 |
| 6 | 6 | 1.02245 | 27.9 | 35.0 | 7 | 83 | Gov. of Guam, Water Quality Data | AGMX2 |
| 6 | 0 | 1.02267 | 29.5 | 36.0 | 12 | 86 | Gov. of Guam, Water Quality Data | AGMX |
| 6 | 10 | 1.02195 | 29.4 | 35.0 | 12 | 86 | Gov. of Guam, Water Quality Data | AGMX |
| 6 | 20 | 1.02195 | 29.4 | 35.0 | 12 | 86 | Gov. of Guam, Water Quality Data | AGMX |
| 6 | 0 | 1.02235 | 28.2 | 35.0 | 4 | 87 | Gov. of Guam, Water Quality Data | AGMX |
| 6 | 10 | 1.02235 | 28.2 | 35.0 | 4 | 87 | Gov. of Guam, Water Quality Data | AGMX |
| 6 | 20 | 1.02235 | 28.2 | 35.0 | 4 | 87 | Gov. of Guam, Water Quality Data | AGMX |
| 6 | 0 | 1.02330 | 27.6 | 36.0 | 13 | 89 | Matson, A.E. (1990) | E |
| 6 | 5 | 1.02341 | 27.5 | 36.1 | 13 | 89 | Matson, A.E. (1990) | E |
| 6 | 10 | 1.02326 | 27.5 | 35.9 | 13 | 89 | Matson, A.E. (1990) | E |
| 6 | 0 | 1.02309 | 27.8 | 35.8 | 13 | 89 | Matson, A.E. (1990) | F |
| 6 | 5 | 1.02347 | 27.3 | 36.1 | 13 | 89 | Matson, A.E. (1990) | F |
| 6 | 10 | 1.02347 | 27.3 | 36.1 | 13 | 89 | Matson, A.E. (1990) | F |
| 7 | 0 | 1.02185 | 29.7 | 35.0 | 9 | 81 | Gov. of Guam, Water Quality Data | AGMX |
| 7 | 3 | 1.02117 | 29.5 | 34.0 | 9 | 81 | Gov. of Guam, Water Quality Data | AGMX |
| 7 | 6 | 1.02192 | 29.5 | 35.0 | 9 | 81 | Gov. of Guam, Water Quality Data | AGMX |
| 7 | 0 | 1.02192 | 29.5 | 35.0 | 9 | 81 | Gov. of Guam, Water Quality Data | AGMX1 |
| 7 | 3 | 1.02117 | 29.5 | 34.0 | 9 | 81 | Gov. of Guam, Water Quality Data | AGMX1 |
| 7 | 0 | 1.02110 | 29.7 | 34.0 | 9 | 81 | Gov. of Guam, Water Quality Data | AGMX2 |
| 7 | 3 | 1.02189 | 29.6 | 35.0 | 9 | 81 | Gov. of Guam, Water Quality Data | AGMX2 |
| 7 | 6 | 1.02192 | 29.5 | 35.0 | 9 | 81 | Gov. of Guam, Water Quality Data | AGMX2 |
| 7 | 0 | 1.02229 | 28.4 | 35.0 | 6 | 82 | Gov. of Guam, Water Quality Data | AGMX |
| 7 | 3 | 1.02229 | 28.4 | 35.0 | 6 | 82 | Gov. of Guam, Water Quality Data | AGMX |
| 7 | 6 | 1.02229 | 28.4 | 35.0 | 6 | 82 | Gov. of Guam, Water Quality Data | AGMX |
| 7 | 0 | 1.02229 | 28.4 | 35.0 | 6 | 82 | Gov. of Guam, Water Quality Data | AGMX1 |
| 7 | 3 | 1.02225 | 28.5 | 35.0 | 6 | 82 | Gov. of Guam, Water Quality Data | AGMX1 |
| 7 | 6 | 1.02229 | 28.4 | 35.0 | 6 | 82 | Gov. of Guam, Water Quality Data | AGMX1 |
| 7 | 0 | 1.02229 | 28.4 | 35.0 | 6 | 82 | Gov. of Guam, Water Quality Data | AGMX2 |
| 7 | 3 | 1.02225 | 28.5 | 35.0 | 6 | 82 | Gov. of Guam, Water Quality Data | AGMX2 |
| 7 | 6 | 1.02229 | 28.4 | 35.0 | 6 | 82 | Gov. of Guam, Water Quality Data | AGMX2 |
| 7 | 0 | 1.02225 | 28.5 | 35.0 | 7 | 83 | Gov. of Guam, Water Quality Data | AGMX |
| 7 | 3 | 1.02225 | 28.5 | 35.0 | 7 | 83 | Gov. of Guam, Water Quality Data | AGMX |
| 7 | 6 | 1.02225 | 28.5 | 35.0 | 7 | 83 | Gov. of Guam, Water Quality Data | AGMX |
| 8 | 0 | 1.02117 | 29.5 | 34.0 | 6 | 81 | Gov. of Guam, Water Quality Data | AGMX |
| 8 | 3 | 1.02120 | 29.4 | 34.0 | 6 | 81 | Gov. of Guam, Water Quality Data | AGMX |
| 8 | 6 | 1.02120 | 29.4 | 34.0 | 6 | 81 | Gov. of Guam, Water Quality Data | AGMX |
| 8 | 0 | 1.02117 | 29.5 | 34.0 | 6 | 81 | Gov. of Guam, Water Quality Data | AGMX1 |
| 8 | 3 | 1.02120 | 29.4 | 34.0 | 6 | 81 | Gov. of Guam, Water Quality Data | AGMX1 |
| 8 | 0 | 1.02117 | 29.5 | 34.0 | 6 | 81 | Gov. of Guam, Water Quality Data | AGMX2 |
| 8 | 3 | 1.02195 | 29.4 | 35.0 | 6 | 81 | Gov. of Guam, Water Quality Data | AGMX2 |
| 8 | 6 | 1.02124 | 29.3 | 34.0 | 6 | 81 | Gov. of Guam, Water Quality Data | AGMX2 |
| 8 | 0 | 1.02297 | 28.6 | 36.0 | 5 | 82 | Gov. of Guam, Water Quality Data | AGMX |
| 8 | 3 | 1.02301 | 28.5 | 36.0 | 5 | 82 | Gov. of Guam, Water Quality Data | AGMX |
| 8 | 6 | 1.02301 | 28.5 | 36.0 | 5 | 82 | Gov. of Guam, Water Quality Data | AGMX |
| 8 | 0 | 1.02199 | 29.3 | 35.0 | 2 | 83 | Gov. of Guam, Water Quality Data | AGMX |
| 8 | 3 | 1.02195 | 29.4 | 35.0 | 2 | 83 | Gov. of Guam, Water Quality Data | AGMX |

| MONTH | DEPTH (meters) | DENSITY gm/cm^3 | TEMP (C) | SAL 0/00 | DAY | YEAR | DATA SOURCE | STATION |
|---|---|---|---|---|---|---|---|---|
| 8 | 6 | 1.02209 | 29.0 | 35.0 | 2 | 83 | Gov. of Guam, Water Quality Data | AGMX |
| 8 | 0 | 1.02199 | 29.3 | 35.0 | 2 | 83 | Gov. of Guam, Water Quality Data | AGMX1 |
| 8 | 3 | 1.02202 | 29.2 | 35.0 | 2 | 83 | Gov. of Guam, Water Quality Data | AGMX1 |
| 8 | 6 | 1.02209 | 29.0 | 35.0 | 2 | 83 | Gov. of Guam, Water Quality Data | AGMX1 |
| 8 | 0 | 1.02195 | 29.4 | 35.0 | 2 | 83 | Gov. of Guam, Water Quality Data | AGMX2 |
| 8 | 3 | 1.02202 | 29.2 | 35.0 | 2 | 83 | Gov. of Guam, Water Quality Data | AGMX2 |
| 8 | 6 | 1.02202 | 29.2 | 35.0 | 2 | 83 | Gov. of Guam, Water Quality Data | AGMX2 |
| 8 | 0 | 1.02192 | 29.5 | 35.0 | 7 | 84 | Gov. of Guam, Water Quality Data | AGMX |
| 8 | 3 | 1.02195 | 29.4 | 35.0 | 7 | 84 | Gov. of Guam, Water Quality Data | AGMX |
| 8 | 6 | 1.02195 | 29.4 | 35.0 | 7 | 84 | Gov. of Guam, Water Quality Data | AGMX |
| 8 | 0 | 1.02130 | 29.1 | 34.0 | 5 | 86 | Gov. of Guam, Water Quality Data | AGMX |
| 8 | 10 | 1.02168 | 29.1 | 34.5 | 5 | 86 | Gov. of Guam, Water Quality Data | AGMX |
| 8 | 20 | 1.02171 | 29.0 | 34.5 | 5 | 86 | Gov. of Guam, Water Quality Data | AGMX |
| 8 | 10 | 1.02209 | 29.0 | 35.0 | 4 | 87 | Gov. of Guam, Water Quality Data | AGMX |
| 8 | 20 | 1.02134 | 29.0 | 34.0 | 4 | 87 | Gov. of Guam, Water Quality Data | AGMX |
| 8 | 10 | 1.02209 | 29.0 | 35.0 | 4 | 87 | Gov. of Guam, Water Quality Data | AGMX1 |
| 8 | 20 | 1.02182 | 29.8 | 35.0 | 4 | 87 | Gov. of Guam, Water Quality Data | AGMX1 |
| 8 | 0 | 1.02134 | 29.0 | 34.0 | 4 | 87 | Gov. of Guam, Water Quality Data | AGMX2 |
| 8 | 10 | 1.02134 | 29.0 | 34.0 | 4 | 87 | Gov. of Guam, Water Quality Data | AGMX2 |
| 8 | 20 | 1.02209 | 29.0 | 35.0 | 4 | 87 | Gov. of Guam, Water Quality Data | AGMX2 |
| 8 | 0 | 1.01954 | 29.9 | 32.0 | 31 | 98 | Gov. of Guam, Water Drogue Study | AGMX |
| 8 | 10 | 1.01961 | 29.7 | 32.0 | 31 | 98 | Gov. of Guam, Water Drogue Study | AGMX |
| 8 | 20 | 1.02114 | 29.6 | 34.0 | 31 | 98 | Gov. of Guam, Water Drogue Study | AGMX |
| 8 | 0 | 1.01957 | 29.8 | 32.0 | 31 | 98 | Gov. of Guam, Water Drogue Study | AGMX1 |
| 8 | 10 | 1.02107 | 29.8 | 34.0 | 31 | 98 | Gov. of Guam, Water Drogue Study | AGMX1 |
| 8 | 0 | 1.01855 | 30.6 | 31.0 | 31 | 98 | Gov. of Guam, Water Drogue Study | AGMX2 |
| 8 | 5 | 1.01944 | 30.2 | 32.0 | 31 | 98 | Gov. of Guam, Water Drogue Study | AGMX2 |
| 8 | 10 | 1.01957 | 29.8 | 32.0 | 31 | 98 | Gov. of Guam, Water Drogue Study | AGMX2 |
| 9 | 0 | 1.02117 | 29.5 | 34.0 | 8 | 81 | Gov. of Guam, Water Quality Data | AGMX |
| 9 | 3 | 1.02127 | 29.2 | 34.0 | 8 | 81 | Gov. of Guam, Water Quality Data | AGMX |
| 9 | 6 | 1.02130 | 29.1 | 34.0 | 8 | 81 | Gov. of Guam, Water Quality Data | AGMX |
| 9 | 0 | 1.02120 | 29.4 | 34.0 | 8 | 81 | Gov. of Guam, Water Quality Data | AGMX1 |
| 9 | 2 | 1.02124 | 29.3 | 34.0 | 8 | 81 | Gov. of Guam, Water Quality Data | AGMX1 |
| 9 | 3 | 1.02127 | 29.2 | 34.0 | 8 | 81 | Gov. of Guam, Water Quality Data | AGMX1 |
| 9 | 0 | 1.02120 | 29.4 | 34.0 | 8 | 81 | Gov. of Guam, Water Quality Data | AGMX2 |
| 9 | 3 | 1.02127 | 29.2 | 34.0 | 8 | 81 | Gov. of Guam, Water Quality Data | AGMX2 |
| 9 | 6 | 1.02130 | 29.1 | 34.0 | 8 | 81 | Gov. of Guam, Water Quality Data | AGMX2 |
| 9 | 0 | 1.02225 | 28.5 | 35.0 | 9 | 82 | Gov. of Guam, Water Quality Data | AGMX |
| 9 | 3 | 1.02225 | 28.5 | 35.0 | 9 | 82 | Gov. of Guam, Water Quality Data | AGMX |
| 9 | 6 | 1.02225 | 28.5 | 35.0 | 9 | 82 | Gov. of Guam, Water Quality Data | AGMX |
| 9 | 0 | 1.02192 | 29.5 | 35.0 | 6 | 83 | Gov. of Guam, Water Quality Data | AGMX |
| 9 | 3 | 1.02192 | 29.5 | 35.0 | 6 | 83 | Gov. of Guam, Water Quality Data | AGMX |
| 9 | 6 | 1.02192 | 29.5 | 35.0 | 6 | 83 | Gov. of Guam, Water Quality Data | AGMX |
| 9 | 0 | 1.02192 | 29.5 | 35.0 | 6 | 83 | Gov. of Guam, Water Quality Data | AGMX1 |
| 9 | 3 | 1.02192 | 29.5 | 35.0 | 6 | 83 | Gov. of Guam, Water Quality Data | AGMX1 |
| 9 | 6 | 1.02192 | 29.5 | 35.0 | 6 | 83 | Gov. of Guam, Water Quality Data | AGMX1 |
| 9 | 0 | 1.02195 | 29.4 | 35.0 | 6 | 83 | Gov. of Guam, Water Quality Data | AGMX2 |
| 9 | 3 | 1.02195 | 29.4 | 35.0 | 6 | 83 | Gov. of Guam, Water Quality Data | AGMX2 |
| 9 | 6 | 1.02192 | 29.5 | 35.0 | 6 | 83 | Gov. of Guam, Water Quality Data | AGMX2 |

| MONTH | DEPTH (meters) | DENSITY gm/cm^3 | TEMP (C) | SAL 0/00 | DAY | YEAR | DATA SOURCE | STATION |
|---|---|---|---|---|---|---|---|---|
| 9 | 0 | 1.02114 | 29.6 | 34.0 | 5 | 85 | Gov. of Guam, Water Quality Data | AGMX |
| 9 | 10 | 1.02117 | 29.5 | 34.0 | 5 | 85 | Gov. of Guam, Water Quality Data | AGMX |
| 9 | 20 | 1.02117 | 29.5 | 34.0 | 5 | 85 | Gov. of Guam, Water Quality Data | AGMX |
| 9 | 0 | 1.02117 | 29.5 | 34.0 | 5 | 85 | Gov. of Guam, Water Quality Data | AGMX1 |
| 9 | 20 | 1.02120 | 29.4 | 34.0 | 5 | 85 | Gov. of Guam, Water Quality Data | AGMX1 |
| 9 | 0 | 1.02110 | 29.7 | 34.0 | 5 | 85 | Gov. of Guam, Water Quality Data | AGMX2 |
| 9 | 10 | 1.02117 | 29.5 | 34.0 | 5 | 85 | Gov. of Guam, Water Quality Data | AGMX2 |
| 9 | 20 | 1.02117 | 29.5 | 34.0 | 5 | 85 | Gov. of Guam, Water Quality Data | AGMX2 |
| 9 | 0 | 1.02234 | 29.6 | 35.6 | 21 | 89 | Matson, A.E. (1990) | E |
| 9 | 5 | 1.02234 | 29.8 | 35.7 | 21 | 89 | Matson, A.E. (1990) | E |
| 9 | 10 | 1.02242 | 29.8 | 35.8 | 21 | 89 | Matson, A.E. (1990) | E |
| 9 | 0 | 1.02262 | 29.2 | 35.8 | 21 | 89 | Matson, A.E. (1990) | F |
| 9 | 5 | 1.02281 | 29.1 | 36.0 | 21 | 89 | Matson, A.E. (1990) | F |
| 9 | 10 | 1.02269 | 29.0 | 35.8 | 21 | 89 | Matson, A.E. (1990) | F |
| 10 | 0 | 1.02110 | 29.7 | 34.0 | 8 | 81 | Gov. of Guam, Water Quality Data | AGMX |
| 10 | 3 | 1.02127 | 29.2 | 34.0 | 8 | 81 | Gov. of Guam, Water Quality Data | AGMX |
| 10 | 6 | 1.02127 | 29.2 | 34.0 | 8 | 81 | Gov. of Guam, Water Quality Data | AGMX |
| 10 | 0 | 1.02110 | 29.7 | 34.0 | 8 | 81 | Gov. of Guam, Water Quality Data | AGMX2 |
| 10 | 3 | 1.02117 | 29.5 | 34.0 | 8 | 81 | Gov. of Guam, Water Quality Data | AGMX2 |
| 10 | 6 | 1.02117 | 29.5 | 34.0 | 8 | 81 | Gov. of Guam, Water Quality Data | AGMX2 |
| 10 | 3 | 1.02117 | 29.5 | 34.0 | 9 | 81 | Gov. of Guam, Water Quality Data | AGMX1 |
| 10 | 6 | 1.02117 | 29.5 | 34.0 | 9 | 81 | Gov. of Guam, Water Quality Data | AGMX1 |
| 10 | 0 | 1.02229 | 28.4 | 35.0 | 26 | 82 | Gov. of Guam, Water Quality Data | AGMX |
| 10 | 3 | 1.02229 | 28.4 | 35.0 | 26 | 82 | Gov. of Guam, Water Quality Data | AGMX |
| 10 | 6 | 1.02229 | 28.4 | 35.0 | 26 | 82 | Gov. of Guam, Water Quality Data | AGMX |
| 10 | 0 | 1.02225 | 28.5 | 35.0 | 7 | 86 | Gov. of Guam, Water Quality Data | AGMX |
| 10 | 10 | 1.02225 | 28.5 | 35.0 | 7 | 86 | Gov. of Guam, Water Quality Data | AGMX |
| 10 | 20 | 1.02225 | 28.5 | 35.0 | 7 | 86 | Gov. of Guam, Water Quality Data | AGMX |
| 10 | 0 | 1.02120 | 29.4 | 34.0 | 6 | 87 | Gov. of Guam, Water Quality Data | AGMX |
| 10 | 10 | 1.02120 | 29.4 | 34.0 | 6 | 87 | Gov. of Guam, Water Quality Data | AGMX |
| 10 | 20 | 1.02195 | 29.4 | 35.0 | 6 | 87 | Gov. of Guam, Water Quality Data | AGMX |
| 11 | 0 | 1.02134 | 29.0 | 34.0 | 5 | 81 | Gov. of Guam, Water Quality Data | AGMX |
| 11 | 6 | 1.02150 | 28.5 | 34.0 | 5 | 81 | Gov. of Guam, Water Quality Data | AGMX |
| 11 | 0 | 1.02134 | 29.0 | 34.0 | 5 | 81 | Gov. of Guam, Water Quality Data | AGMX1 |
| 11 | 3 | 1.02144 | 28.7 | 34.0 | 5 | 81 | Gov. of Guam, Water Quality Data | AGMX1 |
| 11 | 0 | 1.02127 | 29.2 | 34.0 | 5 | 81 | Gov. of Guam, Water Quality Data | AGMX2 |
| 11 | 3 | 1.02134 | 29.0 | 34.0 | 5 | 81 | Gov. of Guam, Water Quality Data | AGMX2 |
| 11 | 6 | 1.02150 | 28.5 | 34.0 | 5 | 81 | Gov. of Guam, Water Quality Data | AGMX2 |
| 11 | 0 | 1.02215 | 28.8 | 35.0 | 10 | 86 | Gov. of Guam, Water Quality Data | AGMX |
| 11 | 10 | 1.02215 | 28.8 | 35.0 | 10 | 86 | Gov. of Guam, Water Quality Data | AGMX |
| 11 | 20 | 1.02215 | 28.8 | 35.0 | 10 | 86 | Gov. of Guam, Water Quality Data | AGMX |
| 11 | 0 | 1.02134 | 29.0 | 34.0 | 9 | 89 | Gov. of Guam, Water Quality Data | AGMX |
| 11 | 10 | 1.02134 | 29.0 | 34.0 | 9 | 89 | Gov. of Guam, Water Quality Data | AGMX |
| 11 | 20 | 1.02134 | 29.0 | 34.0 | 9 | 89 | Gov. of Guam, Water Quality Data | AGMX |
| 12 | 0 | 1.02117 | 29.5 | 34.0 | 3 | 81 | Gov. of Guam, Water Quality Data | AGMX |
| 12 | 3 | 1.02117 | 29.5 | 34.0 | 3 | 81 | Gov. of Guam, Water Quality Data | AGMX |
| 12 | 6 | 1.02137 | 28.9 | 34.0 | 3 | 81 | Gov. of Guam, Water Quality Data | AGMX |
| 12 | 0 | 1.02215 | 28.8 | 35.0 | 7 | 82 | Gov. of Guam, Water Quality Data | AGMX |
| 12 | 3 | 1.02173 | 27.8 | 34.0 | 7 | 82 | Gov. of Guam, Water Quality Data | AGMX |
| 12 | 6 | 1.02248 | 27.8 | 35.0 | 7 | 82 | Gov. of Guam, Water Quality Data | AGMX |

| MONTH | DEPTH (meters) | DENSITY gm/cm^3 | TEMP C) | SAL 0/00 | DAY | YEAR | DATA SOURCE | STATION |
|---|---|---|---|---|---|---|---|---|
| 12 | 0 | 1.02209 | 29.0 | 35.0 | 5 | 83 | Gov. of Guam, Water Quality Data | AGMX |
| 12 | 3 | 1.02209 | 29.0 | 35.0 | 5 | 83 | Gov. of Guam, Water Quality Data | AGMX |
| 12 | 6 | 1.02209 | 29.0 | 35.0 | 5 | 83 | Gov. of Guam, Water Quality Data | AGMX |
| 12 | 10 | 1.02215 | 28.8 | 35.0 | 3 | 87 | Gov. of Guam, Water Quality Data | AGMX |
| 12 | 20 | 1.02215 | 28.8 | 35.0 | 3 | 87 | Gov. of Guam, Water Quality Data | AGMX |
| 12 | 0 | 1.02150 | 28.5 | 34.0 | 7 | 89 | Gov. of Guam, Water Quality Data | AGMX |
| 12 | 10 | 1.02150 | 28.5 | 34.0 | 7 | 89 | Gov. of Guam, Water Quality Data | AGMX |
| 12 | 20 | 1.02107 | 29.8 | 34.0 | 7 | 89 | Gov. of Guam, Water Quality Data | AGMX |
| 12 | 0 | 1.02147 | 28.6 | 34.0 | 7 | 89 | Gov. of Guam, Water Quality Data | AGMX1 |
| 12 | 20 | 1.02147 | 28.6 | 34.0 | 7 | 89 | Gov. of Guam, Water Quality Data | AGMX1 |
| 12 | 0 | 1.02118 | 31.0 | 34.7 | 12 | 89 | Matson, A.E. (1990) | D |
| 12 | 5 | 1.02148 | 31.0 | 35.1 | 12 | 89 | Matson, A.E. (1990) | D |
| 12 | 10 | 1.02140 | 31.0 | 35.0 | 12 | 89 | Matson, A.E. (1990) | D |
| 12 | 0 | 1.02148 | 31.0 | 35.1 | 12 | 89 | Matson, A.E. (1990) | E |
| 12 | 5 | 1.02133 | 31.0 | 34.9 | 12 | 89 | Matson, A.E. (1990) | E |
| 12 | 10 | 1.02148 | 31.0 | 35.1 | 12 | 89 | Matson, A.E. (1990) | E |
| 12 | 0 | 1.02150 | 30.5 | 34.9 | 12 | 89 | Matson, A.E. (1990) | F |
| 12 | 5 | 1.02128 | 30.7 | 34.7 | 12 | 89 | Matson, A.E. (1990) | F |
| 12 | 10 | 1.02131 | 30.4 | 34.6 | 12 | 89 | Matson, A.E. (1990) | F |




ND 1474

| | | | |
|---|---|---|---|
| | AGANA SEWAGE TREATMENT | Agana STP Historic | FIGURE |

# AGANA WW. DENSITY PROFILE DATA OBTAINED DURING NOV. 6-13, 1998 BY EDWARD K. NODA AND ASSOCIATES, INC. (Lat. and Long. in WGS 83)

| MONTH | DAY | YEAR | DEPTH (meters) | DENSITY gm/cm^3 | TEMP (C) | SAL 0/00 | Lat. | Long. |
|---|---|---|---|---|---|---|---|---|
| 11 | 6 | 98 | 0.07 | 1.02392 | 29.34 | 37.62 | 13 29 15.10N | 144 44 40.14E |
| 11 | 6 | 98 | 5.04 | 1.02391 | 29.19 | 37.53 | 13 29 15.10N | 144 44 40.14E |
| 11 | 6 | 98 | 10.42 | 1.02391 | 29.15 | 37.52 | 13 29 15.10N | 144 44 40.14E |
| 11 | 6 | 98 | 15.30 | 1.02392 | 29.14 | 37.53 | 13 29 15.10N | 144 44 40.14E |
| 11 | 6 | 98 | 20.44 | 1.02391 | 29.13 | 37.52 | 13 29 15.10N | 144 44 40.14E |
| 11 | 6 | 98 | 25.22 | 1.02391 | 29.13 | 37.51 | 13 29 15.10N | 144 44 40.14E |
| 11 | 6 | 98 | 30.20 | 1.02390 | 29.12 | 37.49 | 13 29 15.10N | 144 44 40.14E |
| 11 | 6 | 98 | 35.19 | 1.02390 | 29.11 | 37.48 | 13 29 15.10N | 144 44 40.14E |
| 11 | 6 | 98 | 40.37 | 1.02389 | 29.10 | 37.47 | 13 29 15.10N | 144 44 40.14E |
| 11 | 6 | 98 | 45.23 | 1.02395 | 28.83 | 37.43 | 13 29 15.10N | 144 44 40.14E |
| 11 | 6 | 98 | 50.22 | 1.02397 | 28.59 | 37.35 | 13 29 15.10N | 144 44 40.14E |
| 11 | 6 | 98 | 55.31 | 1.02414 | 28.35 | 37.47 | 13 29 15.10N | 144 44 40.14E |
| 11 | 6 | 98 | 60.10 | 1.02417 | 28.21 | 37.45 | 13 29 15.10N | 144 44 40.14E |
| 11 | 6 | 98 | 65.30 | 1.02422 | 28.05 | 37.44 | 13 29 15.10N | 144 44 40.14E |
| 11 | 6 | 98 | 70.60 | 1.02431 | 27.87 | 37.49 | 13 29 15.10N | 144 44 40.14E |
| 11 | 6 | 98 | 74.26 | 1.02433 | 27.82 | 37.49 | 13 29 15.10N | 144 44 40.14E |
| 11 | 8 | 98 | 0.07 | 1.02392 | 29.05 | 37.48 | 13 29 11.05N | 144 44 48.75E |
| 11 | 8 | 98 | 5.35 | 1.02393 | 29.05 | 37.50 | 13 29 11.05N | 144 44 48.75E |
| 11 | 8 | 98 | 10.48 | 1.02393 | 29.05 | 37.51 | 13 29 11.05N | 144 44 48.75E |
| 11 | 8 | 98 | 15.56 | 1.02392 | 29.05 | 37.50 | 13 29 11.05N | 144 44 48.75E |
| 11 | 8 | 98 | 20.75 | 1.02392 | 29.05 | 37.49 | 13 29 11.05N | 144 44 48.75E |
| 11 | 8 | 98 | 25.22 | 1.02391 | 29.04 | 37.48 | 13 29 11.05N | 144 44 48.75E |
| 11 | 8 | 98 | 30.20 | 1.02391 | 29.03 | 37.47 | 13 29 11.05N | 144 44 48.75E |
| 11 | 8 | 98 | 35.09 | 1.02391 | 29.03 | 37.47 | 13 29 11.05N | 144 44 48.75E |
| 11 | 8 | 98 | 40.68 | 1.02391 | 29.02 | 37.46 | 13 29 11.05N | 144 44 48.75E |
| 11 | 8 | 98 | 45.54 | 1.02390 | 29.02 | 37.45 | 13 29 11.05N | 144 44 48.75E |
| 11 | 8 | 98 | 50.55 | 1.02390 | 29.02 | 37.44 | 13 29 11.05N | 144 44 48.75E |
| 11 | 8 | 98 | 55.41 | 1.02389 | 29.02 | 37.44 | 13 29 11.05N | 144 44 48.75E |
| 11 | 8 | 98 | 59.17 | 1.02389 | 29.02 | 37.44 | 13 29 11.05N | 144 44 48.75E |
| 11 | 8 | 98 | 0.07 | 1.02387 | 29.06 | 37.42 | 13 29 13.07N | 144 44 45.08E |
| 11 | 8 | 98 | 5.55 | 1.02388 | 29.04 | 37.43 | 13 29 13.07N | 144 44 45.08E |
| 11 | 8 | 98 | 10.12 | 1.02388 | 29.04 | 37.43 | 13 29 13.07N | 144 44 45.08E |
| 11 | 8 | 98 | 15.30 | 1.02388 | 29.04 | 37.43 | 13 29 13.07N | 144 44 45.08E |
| 11 | 8 | 98 | 20.48 | 1.02388 | 29.04 | 37.43 | 13 29 13.07N | 144 44 45.08E |
| 11 | 8 | 98 | 25.45 | 1.02389 | 29.04 | 37.44 | 13 29 13.07N | 144 44 45.08E |
| 11 | 8 | 98 | 30.38 | 1.02389 | 29.04 | 37.44 | 13 29 13.07N | 144 44 45.08E |
| 11 | 8 | 98 | 35.36 | 1.02389 | 29.03 | 37.44 | 13 29 13.07N | 144 44 45.08E |
| 11 | 8 | 98 | 40.15 | 1.02389 | 29.03 | 37.44 | 13 29 13.07N | 144 44 45.08E |
| 11 | 8 | 98 | 45.54 | 1.02389 | 29.02 | 37.44 | 13 29 13.07N | 144 44 45.08E |
| 11 | 8 | 98 | 50.12 | 1.02390 | 29.01 | 37.44 | 13 29 13.07N | 144 44 45.08E |
| 11 | 8 | 98 | 55.41 | 1.02391 | 28.99 | 37.44 | 13 29 13.07N | 144 44 45.08E |
| 11 | 8 | 98 | 60.09 | 1.02392 | 28.79 | 37.37 | 13 29 13.07N | 144 44 45.08E |
| 11 | 8 | 98 | 65.09 | 1.02403 | 28.63 | 37.45 | 13 29 13.07N | 144 44 45.08E |
| 11 | 8 | 98 | 68.55 | 1.02410 | 28.57 | 37.52 | 13 29 13.07N | 144 44 45.08E |
| 11 | 8 | 98 | 0.07 | 1.02388 | 29.06 | 37.43 | 13 29 13.80N | 144 44 43.87E |
| 11 | 8 | 98 | 5.25 | 1.02388 | 29.05 | 37.43 | 13 29 13.80N | 144 44 43.87E |
| 11 | 8 | 98 | 10.48 | 1.02388 | 29.04 | 37.43 | 13 29 13.80N | 144 44 43.87E |
| 11 | 8 | 98 | 15.06 | 1.02388 | 29.04 | 37.43 | 13 29 13.80N | 144 44 43.87E |
| 11 | 8 | 98 | 20.24 | 1.02389 | 29.04 | 37.44 | 13 29 13.80N | 144 44 43.87E |
| 11 | 8 | 98 | 25.35 | 1.02389 | 29.04 | 37.44 | 13 29 13.80N | 144 44 43.87E |
| 11 | 8 | 98 | 30.20 | 1.02389 | 29.04 | 37.45 | 13 29 13.80N | 144 44 43.87E |
| 11 | 8 | 98 | 35.09 | 1.02389 | 29.03 | 37.44 | 13 29 13.80N | 144 44 43.87E |
| 11 | 8 | 98 | 40.53 | 1.02389 | 29.03 | 37.44 | 13 29 13.80N | 144 44 43.87E |

| MONTH | DAY | YEAR | DEPTH (meters) | DENSITY gm/cm^3 | TEMP (C) | SAL 0/00 | Lat. | Long. |
|---|---|---|---|---|---|---|---|---|
| 11 | 8 | 98 | 45.26 | 1.02390 | 29.03 | 37.45 | 13 29 13.80N | 144 44 43.87E |
| 11 | 8 | 98 | 50.53 | 1.02390 | 29.03 | 37.45 | 13 29 13.80N | 144 44 43.87E |
| 11 | 8 | 98 | 55.21 | 1.02389 | 29.03 | 37.45 | 13 29 13.80N | 144 44 43.87E |
| 11 | 8 | 98 | 60.61 | 1.02390 | 29.02 | 37.45 | 13 29 13.80N | 144 44 43.87E |
| 11 | 8 | 98 | 65.60 | 1.02392 | 28.89 | 37.42 | 13 29 13.80N | 144 44 43.87E |
| 11 | 8 | 98 | 68.86 | 1.02402 | 28.72 | 37.47 | 13 29 13.80N | 144 44 43.87E |
| 11 | 9 | 98 | 0.07 | 1.02387 | 29.08 | 37.44 | 13 29 12.76N | 144 44 53.96E |
| 11 | 9 | 98 | 5.25 | 1.02389 | 29.13 | 37.48 | 13 29 12.76N | 144 44 53.96E |
| 11 | 9 | 98 | 10.02 | 1.02390 | 29.12 | 37.50 | 13 29 12.76N | 144 44 53.96E |
| 11 | 9 | 98 | 15.16 | 1.02390 | 29.11 | 37.48 | 13 29 12.76N | 144 44 53.96E |
| 11 | 9 | 98 | 20.14 | 1.02389 | 29.11 | 37.48 | 13 29 12.76N | 144 44 53.96E |
| 11 | 9 | 98 | 25.12 | 1.02389 | 29.11 | 37.47 | 13 29 12.76N | 144 44 53.96E |
| 11 | 9 | 98 | 30.20 | 1.02388 | 29.11 | 37.46 | 13 29 12.76N | 144 44 53.96E |
| 11 | 9 | 98 | 35.29 | 1.02387 | 29.09 | 37.45 | 13 29 12.76N | 144 44 53.96E |
| 11 | 9 | 98 | 40.17 | 1.02388 | 29.08 | 37.45 | 13 29 12.76N | 144 44 53.96E |
| 11 | 9 | 98 | 45.03 | 1.02389 | 29.05 | 37.45 | 13 29 12.76N | 144 44 53.96E |
| 11 | 9 | 98 | 50.33 | 1.02390 | 28.99 | 37.44 | 13 29 12.76N | 144 44 53.96E |
| 11 | 9 | 98 | 55.21 | 1.02396 | 28.86 | 37.45 | 13 29 12.76N | 144 44 53.96E |
| 11 | 9 | 98 | 60.29 | 1.02401 | 28.71 | 37.46 | 13 29 12.76N | 144 44 53.96E |
| 11 | 9 | 98 | 65.28 | 1.02405 | 28.60 | 37.46 | 13 29 12.76N | 144 44 53.96E |
| 11 | 9 | 98 | 70.19 | 1.02405 | 28.59 | 37.46 | 13 29 12.76N | 144 44 53.96E |
| 11 | 9 | 98 | 71.71 | 1.02406 | 28.57 | 37.47 | 13 29 12.76N | 144 44 53.96E |
| 11 | 9 | 98 | 0.21 | 1.02382 | 29.10 | 37.38 | 13 29 13.18N | 144 44 53.95E |
| 11 | 9 | 98 | 5.04 | 1.02385 | 29.13 | 37.43 | 13 29 13.18N | 144 44 53.95E |
| 11 | 9 | 98 | 10.22 | 1.02386 | 29.12 | 37.44 | 13 29 13.18N | 144 44 53.95E |
| 11 | 9 | 98 | 15.40 | 1.02387 | 29.12 | 37.45 | 13 29 13.18N | 144 44 53.95E |
| 11 | 9 | 98 | 20.14 | 1.02387 | 29.11 | 37.45 | 13 29 13.18N | 144 44 53.95E |
| 11 | 9 | 98 | 25.12 | 1.02387 | 29.11 | 37.45 | 13 29 13.18N | 144 44 53.95E |
| 11 | 9 | 98 | 30.10 | 1.02387 | 29.11 | 37.44 | 13 29 13.18N | 144 44 53.95E |
| 11 | 9 | 98 | 35.19 | 1.02387 | 29.11 | 37.45 | 13 29 13.18N | 144 44 53.95E |
| 11 | 9 | 98 | 40.15 | 1.02387 | 29.09 | 37.44 | 13 29 13.18N | 144 44 53.95E |
| 11 | 9 | 98 | 45.13 | 1.02388 | 29.07 | 37.45 | 13 29 13.18N | 144 44 53.95E |
| 11 | 9 | 98 | 50.02 | 1.02389 | 29.04 | 37.45 | 13 29 13.18N | 144 44 53.95E |
| 11 | 9 | 98 | 55.31 | 1.02392 | 28.96 | 37.45 | 13 29 13.18N | 144 44 53.95E |
| 11 | 9 | 98 | 60.20 | 1.02394 | 28.90 | 37.45 | 13 29 13.18N | 144 44 53.95E |
| 11 | 9 | 98 | 65.39 | 1.02398 | 28.76 | 37.44 | 13 29 13.18N | 144 44 53.95E |
| 11 | 9 | 98 | 70.09 | 1.02404 | 28.64 | 37.46 | 13 29 13.18N | 144 44 53.95E |
| 11 | 9 | 98 | 72.12 | 1.02407 | 28.58 | 37.48 | 13 29 13.18N | 144 44 53.95E |
| 11 | 9 | 98 | 0.57 | 1.02383 | 29.10 | 37.38 | 13 29 13.60N | 144 44 53.91E |
| 11 | 9 | 98 | 5.14 | 1.02385 | 29.13 | 37.43 | 13 29 13.60N | 144 44 53.91E |
| 11 | 9 | 98 | 10.32 | 1.02386 | 29.12 | 37.45 | 13 29 13.60N | 144 44 53.91E |
| 11 | 9 | 98 | 15.16 | 1.02387 | 29.12 | 37.45 | 13 29 13.60N | 144 44 53.91E |
| 11 | 9 | 98 | 20.07 | 1.02387 | 29.11 | 37.45 | 13 29 13.60N | 144 44 53.91E |
| 11 | 9 | 98 | 25.02 | 1.02387 | 29.11 | 37.45 | 13 29 13.60N | 144 44 53.91E |
| 11 | 9 | 98 | 30.20 | 1.02387 | 29.11 | 37.45 | 13 29 13.60N | 144 44 53.91E |
| 11 | 9 | 98 | 35.39 | 1.02387 | 29.10 | 37.45 | 13 29 13.60N | 144 44 53.91E |
| 11 | 9 | 98 | 40.05 | 1.02387 | 29.09 | 37.44 | 13 29 13.60N | 144 44 53.91E |
| 11 | 9 | 98 | 45.23 | 1.02387 | 29.09 | 37.45 | 13 29 13.60N | 144 44 53.91E |
| 11 | 9 | 98 | 50.02 | 1.02388 | 29.07 | 37.45 | 13 29 13.60N | 144 44 53.91E |
| 11 | 9 | 98 | 55.21 | 1.02390 | 29.03 | 37.45 | 13 29 13.60N | 144 44 53.91E |
| 11 | 9 | 98 | 60.00 | 1.02391 | 28.98 | 37.45 | 13 29 13.60N | 144 44 53.91E |
| 11 | 9 | 98 | 65.30 | 1.02401 | 28.71 | 37.45 | 13 29 13.60N | 144 44 53.91E |
| 11 | 9 | 98 | 70.28 | 1.02405 | 28.61 | 37.47 | 13 29 13.60N | 144 44 53.91E |
| 11 | 9 | 98 | 74.46 | 1.02410 | 28.50 | 37.49 | 13 29 13.60N | 144 44 53.91E |
| 11 | 11 | 98 | 1.58 | 1.02384 | 29.11 | 37.41 | 13 29 10.91N | 144 44 43.57E |
| 11 | 11 | 98 | 5.11 | 1.02386 | 29.09 | 37.43 | 13 29 10.91N | 144 44 43.57E |
| 11 | 11 | 98 | 10.02 | 1.02388 | 29.05 | 37.44 | 13 29 10.91N | 144 44 43.57E |

ND 1477

| MONTH | DAY | YEAR | DEPTH (meters) | DENSITY gm/cm^3 | TEMP (C) | SAL 0/00 | c. | Long. |
|---|---|---|---|---|---|---|---|---|
| 11 | 11 | 98 | 15.36 | 1.02389 | 29.03 | 37.44 | 13 29 10.91N | 144 44 43.57E |
| 11 | 11 | 98 | 20.17 | 1.02389 | 29.03 | 37.44 | 13 29 10.91N | 144 44 43.57E |
| 11 | 11 | 98 | 25.32 | 1.02389 | 29.03 | 37.44 | 13 29 10.91N | 144 44 43.57E |
| 11 | 11 | 98 | 30.20 | 1.02389 | 29.02 | 37.44 | 13 29 10.91N | 144 44 43.57E |
| 11 | 11 | 98 | 35.06 | 1.02389 | 29.02 | 37.44 | 13 29 10.91N | 144 44 43.57E |
| 11 | 11 | 98 | 40.25 | 1.02390 | 29.01 | 37.44 | 13 29 10.91N | 144 44 43.57E |
| 11 | 11 | 98 | 45.13 | 1.02390 | 29.01 | 37.44 | 13 29 10.91N | 144 44 43.57E |
| 11 | 11 | 98 | 50.02 | 1.02390 | 29.00 | 37.44 | 13 29 10.91N | 144 44 43.57E |
| 11 | 11 | 98 | 55.11 | 1.02391 | 28.99 | 37.45 | 13 29 10.91N | 144 44 43.57E |
| 11 | 11 | 98 | 56.43 | 1.02391 | 28.98 | 37.45 | 13 29 10.91N | 144 44 43.57E |
| 11 | 11 | 98 | 2.63 | 1.02379 | 29.21 | 37.39 | 13 29 11.82N | 144 44 47.62E |
| 11 | 11 | 98 | 5.25 | 1.02380 | 29.20 | 37.40 | 13 29 11.82N | 144 44 47.62E |
| 11 | 11 | 98 | 10.42 | 1.02386 | 29.09 | 37.43 | 13 29 11.82N | 144 44 47.62E |
| 11 | 11 | 98 | 15.06 | 1.02388 | 29.06 | 37.44 | 13 29 11.82N | 144 44 47.62E |
| 11 | 11 | 98 | 20.44 | 1.02389 | 29.04 | 37.44 | 13 29 11.82N | 144 44 47.62E |
| 11 | 11 | 98 | 25.12 | 1.02389 | 29.04 | 37.44 | 13 29 11.82N | 144 44 47.62E |
| 11 | 11 | 98 | 30.20 | 1.02389 | 29.03 | 37.44 | 13 29 11.82N | 144 44 47.62E |
| 11 | 11 | 98 | 35.19 | 1.02389 | 29.03 | 37.44 | 13 29 11.82N | 144 44 47.62E |
| 11 | 11 | 98 | 40.27 | 1.02389 | 29.02 | 37.44 | 13 29 11.82N | 144 44 47.62E |
| 11 | 11 | 98 | 45.36 | 1.02391 | 28.99 | 37.44 | 13 29 11.82N | 144 44 47.62E |
| 11 | 11 | 98 | 50.04 | 1.02391 | 28.98 | 37.44 | 13 29 11.82N | 144 44 47.62E |
| 11 | 11 | 98 | 55.21 | 1.02391 | 28.98 | 37.44 | 13 29 11.82N | 144 44 47.62E |
| 11 | 11 | 98 | 60.10 | 1.02391 | 28.97 | 37.45 | 13 29 11.82N | 144 44 47.62E |
| 11 | 11 | 98 | 65.28 | 1.02392 | 28.96 | 37.45 | 13 29 11.82N | 144 44 47.62E |
| 11 | 11 | 98 | 0.37 | 1.02396 | 29.12 | 37.57 | 13 29 12.41N | 144 44 47.94E |
| 11 | 11 | 98 | 5.04 | 1.02394 | 29.09 | 37.53 | 13 29 12.41N | 144 44 47.94E |
| 11 | 11 | 98 | 10.18 | 1.02394 | 29.06 | 37.52 | 13 29 12.41N | 144 44 47.94E |
| 11 | 11 | 98 | 15.30 | 1.02394 | 29.05 | 37.52 | 13 29 12.41N | 144 44 47.94E |
| 11 | 11 | 98 | 20.04 | 1.02392 | 29.05 | 37.49 | 13 29 12.41N | 144 44 47.94E |
| 11 | 11 | 98 | 25.32 | 1.02391 | 29.04 | 37.47 | 13 29 12.41N | 144 44 47.94E |
| 11 | 11 | 98 | 30.00 | 1.02391 | 29.04 | 37.47 | 13 29 12.41N | 144 44 47.94E |
| 11 | 11 | 98 | 35.16 | 1.02390 | 29.03 | 37.45 | 13 29 12.41N | 144 44 47.94E |
| 11 | 11 | 98 | 40.17 | 1.02390 | 29.00 | 37.45 | 13 29 12.41N | 144 44 47.94E |
| 11 | 11 | 98 | 45.23 | 1.02391 | 28.99 | 37.45 | 13 29 12.41N | 144 44 47.94E |
| 11 | 11 | 98 | 50.02 | 1.02393 | 28.95 | 37.45 | 13 29 12.41N | 144 44 47.94E |
| 11 | 11 | 98 | 55.31 | 1.02394 | 28.90 | 37.45 | 13 29 12.41N | 144 44 47.94E |
| 11 | 11 | 98 | 60.31 | 1.02396 | 28.84 | 37.45 | 13 29 12.41N | 144 44 47.94E |
| 11 | 11 | 98 | 65.08 | 1.02404 | 28.62 | 37.46 | 13 29 12.41N | 144 44 47.94E |
| 11 | 11 | 98 | 67.33 | 1.02406 | 28.56 | 37.46 | 13 29 12.41N | 144 44 47.94E |
| 11 | 11 | 98 | 0.98 | 1.02379 | 29.26 | 37.41 | 13 29 12.56N | 144 44 50.47E |
| 11 | 11 | 98 | 5.35 | 1.02386 | 29.10 | 37.43 | 13 29 12.56N | 144 44 50.47E |
| 11 | 11 | 98 | 10.02 | 1.02388 | 29.07 | 37.45 | 13 29 12.56N | 144 44 50.47E |
| 11 | 11 | 98 | 15.30 | 1.02389 | 29.05 | 37.45 | 13 29 12.56N | 144 44 50.47E |
| 11 | 11 | 98 | 20.14 | 1.02389 | 29.05 | 37.44 | 13 29 12.56N | 144 44 50.47E |
| 11 | 11 | 98 | 25.32 | 1.02389 | 29.04 | 37.44 | 13 29 12.56N | 144 44 50.47E |
| 11 | 11 | 98 | 30.00 | 1.02389 | 29.04 | 37.44 | 13 29 12.56N | 144 44 50.47E |
| 11 | 11 | 98 | 35.29 | 1.02389 | 29.02 | 37.44 | 13 29 12.56N | 144 44 50.47E |
| 11 | 11 | 98 | 40.27 | 1.02389 | 29.01 | 37.44 | 13 29 12.56N | 144 44 50.47E |
| 11 | 11 | 98 | 45.03 | 1.02390 | 29.01 | 37.44 | 13 29 12.56N | 144 44 50.47E |
| 11 | 11 | 98 | 50.33 | 1.02390 | 29.00 | 37.44 | 13 29 12.56N | 144 44 50.47E |
| 11 | 11 | 98 | 55.21 | 1.02390 | 28.99 | 37.44 | 13 29 12.56N | 144 44 50.47E |
| 11 | 11 | 98 | 60.09 | 1.02392 | 28.97 | 37.45 | 13 29 12.56N | 144 44 50.47E |
| 11 | 11 | 98 | 65.20 | 1.02392 | 28.95 | 37.45 | 13 29 12.56N | 144 44 50.47E |
| 11 | 11 | 98 | 68.55 | 1.02393 | 28.95 | 37.45 | 13 29 12.56N | 144 44 50.47E |
| 11 | 11 | 98 | 0.82 | 1.02382 | 29.13 | 37.40 | 13 29 12.62N | 144 44 42.69E |
| 11 | 11 | 98 | 5.25 | 1.02384 | 29.13 | 37.42 | 13 29 12.62N | 144 44 42.69E |
| [illegible] | | | [illegible] | [illegible] | [illegible] | [illegible] | 13 29 12.62N | 144 44 42.69E |

| MONTH | DAY | YEAR | DEPTH (meters) | DENSITY gm/cm^3 | TEMP (C) | SAL 0/00 | Lat. | Long. |
|---|---|---|---|---|---|---|---|---|
| 11 | 11 | 98 | 15.26 | 1.02388 | 29.05 | 37.43 | 13 29 12.62N | 144 44 42.69E |
| 11 | 11 | 98 | 20.38 | 1.02388 | 29.05 | 37.44 | 13 29 12.62N | 144 44 42.69E |
| 11 | 11 | 98 | 25.35 | 1.02388 | 29.05 | 37.44 | 13 29 12.62N | 144 44 42.69E |
| 11 | 11 | 98 | 30.20 | 1.02389 | 29.04 | 37.44 | 13 29 12.62N | 144 44 42.69E |
| 11 | 11 | 98 | 35.26 | 1.02388 | 29.04 | 37.44 | 13 29 12.62N | 144 44 42.69E |
| 11 | 11 | 98 | 40.27 | 1.02389 | 29.03 | 37.44 | 13 29 12.62N | 144 44 42.69E |
| 11 | 11 | 98 | 45.13 | 1.02389 | 29.03 | 37.44 | 13 29 12.62N | 144 44 42.69E |
| 11 | 11 | 98 | 50.02 | 1.02390 | 29.01 | 37.44 | 13 29 12.62N | 144 44 42.69E |
| 11 | 11 | 98 | 55.01 | 1.02392 | 28.96 | 37.45 | 13 29 12.62N | 144 44 42.69E |
| 11 | 11 | 98 | 60.20 | 1.02393 | 28.94 | 37.45 | 13 29 12.62N | 144 44 42.69E |
| 11 | 11 | 98 | 65.20 | 1.02397 | 28.84 | 37.46 | 13 29 12.62N | 144 44 42.69E |
| 11 | 11 | 98 | 66.61 | 1.02403 | 28.76 | 37.51 | 13 29 12.62N | 144 44 42.69E |
| 11 | 11 | 98 | 0.37 | 1.02383 | 29.15 | 37.42 | 13 29 12.85N | 144 44 39.03E |
| 11 | 11 | 98 | 5.35 | 1.02385 | 29.14 | 37.43 | 13 29 12.85N | 144 44 39.03E |
| 11 | 11 | 98 | 10.28 | 1.02385 | 29.13 | 37.43 | 13 29 12.85N | 144 44 39.03E |
| 11 | 11 | 98 | 15.20 | 1.02385 | 29.10 | 37.42 | 13 29 12.85N | 144 44 39.03E |
| 11 | 11 | 98 | 20.14 | 1.02388 | 29.05 | 37.44 | 13 29 12.85N | 144 44 39.03E |
| 11 | 11 | 98 | 25.32 | 1.02389 | 29.05 | 37.44 | 13 29 12.85N | 144 44 39.03E |
| 11 | 11 | 98 | 30.20 | 1.02389 | 29.04 | 37.44 | 13 29 12.85N | 144 44 39.03E |
| 11 | 11 | 98 | 35.06 | 1.02389 | 29.03 | 37.44 | 13 29 12.85N | 144 44 39.03E |
| 11 | 11 | 98 | 40.35 | 1.02389 | 29.03 | 37.44 | 13 29 12.85N | 144 44 39.03E |
| 11 | 11 | 98 | 45.03 | 1.02389 | 29.03 | 37.44 | 13 29 12.85N | 144 44 39.03E |
| 11 | 11 | 98 | 50.33 | 1.02390 | 29.00 | 37.44 | 13 29 12.85N | 144 44 39.03E |
| 11 | 11 | 98 | 55.01 | 1.02391 | 28.98 | 37.44 | 13 29 12.85N | 144 44 39.03E |
| 11 | 11 | 98 | 60.10 | 1.02392 | 28.96 | 37.44 | 13 29 12.85N | 144 44 39.03E |
| 11 | 11 | 98 | 65.49 | 1.02396 | 28.88 | 37.46 | 13 29 12.85N | 144 44 39.03E |
| 11 | 12 | 98 | 0.57 | 1.02392 | 29.13 | 37.52 | 13 29 13.57N | 144 44 36.20E |
| 11 | 12 | 98 | 5.35 | 1.02395 | 29.06 | 37.54 | 13 29 13.57N | 144 44 36.20E |
| 11 | 12 | 98 | 10.12 | 1.02394 | 29.04 | 37.52 | 13 29 13.57N | 144 44 36.20E |
| 11 | 12 | 98 | 15.06 | 1.02393 | 29.04 | 37.49 | 13 29 13.57N | 144 44 36.20E |
| 11 | 12 | 98 | 20.24 | 1.02391 | 29.03 | 37.47 | 13 29 13.57N | 144 44 36.20E |
| 11 | 12 | 98 | 25.22 | 1.02390 | 29.03 | 37.46 | 13 29 13.57N | 144 44 36.20E |
| 11 | 12 | 98 | 30.00 | 1.02390 | 29.02 | 37.45 | 13 29 13.57N | 144 44 36.20E |
| 11 | 12 | 98 | 35.19 | 1.02389 | 29.02 | 37.44 | 13 29 13.57N | 144 44 36.20E |
| 11 | 12 | 98 | 40.05 | 1.02389 | 29.02 | 37.44 | 13 29 13.57N | 144 44 36.20E |
| 11 | 12 | 98 | 45.16 | 1.02389 | 29.02 | 37.44 | 13 29 13.57N | 144 44 36.20E |
| 11 | 12 | 98 | 46.88 | 1.02389 | 29.02 | 37.44 | 13 29 13.57N | 144 44 36.20E |
| 11 | 12 | 98 | 0.88 | 1.02377 | 29.20 | 37.36 | 13 29 15.53N | 144 44 43.73E |
| 11 | 12 | 98 | 5.45 | 1.02388 | 29.05 | 37.43 | 13 29 15.53N | 144 44 43.73E |
| 11 | 12 | 98 | 10.42 | 1.02388 | 29.04 | 37.43 | 13 29 15.53N | 144 44 43.73E |
| 11 | 12 | 98 | 15.50 | 1.02388 | 29.03 | 37.44 | 13 29 15.53N | 144 44 43.73E |
| 11 | 12 | 98 | 20.17 | 1.02389 | 29.03 | 37.44 | 13 29 15.53N | 144 44 43.73E |
| 11 | 12 | 98 | 25.25 | 1.02389 | 29.03 | 37.44 | 13 29 15.53N | 144 44 43.73E |
| 11 | 12 | 98 | 30.20 | 1.02389 | 29.02 | 37.44 | 13 29 15.53N | 144 44 43.73E |
| 11 | 12 | 98 | 35.16 | 1.02389 | 29.01 | 37.43 | 13 29 15.53N | 144 44 43.73E |
| 11 | 12 | 98 | 40.07 | 1.02389 | 29.01 | 37.43 | 13 29 15.53N | 144 44 43.73E |
| 11 | 12 | 98 | 45.23 | 1.02390 | 29.00 | 37.44 | 13 29 15.53N | 144 44 43.73E |
| 11 | 12 | 98 | 50.12 | 1.02390 | 29.01 | 37.44 | 13 29 15.53N | 144 44 43.73E |
| 11 | 12 | 98 | 53.06 | 1.02392 | 28.96 | 37.45 | 13 29 15.53N | 144 44 43.73E |
| 11 | 13 | 98 | 0.57 | 1.02386 | 29.02 | 37.40 | 13 29 13.51N | 144 44 54.85E |
| 11 | 13 | 98 | 5.04 | 1.02387 | 29.01 | 37.40 | 13 29 13.51N | 144 44 54.85E |
| 11 | 13 | 98 | 10.18 | 1.02388 | 28.99 | 37.40 | 13 29 13.51N | 144 44 54.85E |
| 11 | 13 | 98 | 15.36 | 1.02388 | 28.97 | 37.40 | 13 29 13.51N | 144 44 54.85E |
| 11 | 13 | 98 | 20.04 | 1.02388 | 28.98 | 37.41 | 13 29 13.51N | 144 44 54.85E |
| 11 | 13 | 98 | 25.12 | 1.02389 | 29.00 | 37.43 | 13 29 13.51N | 144 44 54.85E |
| 11 | 13 | 98 | 30.10 | 1.02389 | 29.00 | 37.43 | 13 29 13.51N | 144 44 54.85E |
| 11 | 13 | 98 | 35.39 | 1.02389 | 29.00 | 37.43 | 13 29 13.51N | 144 44 54.85E |

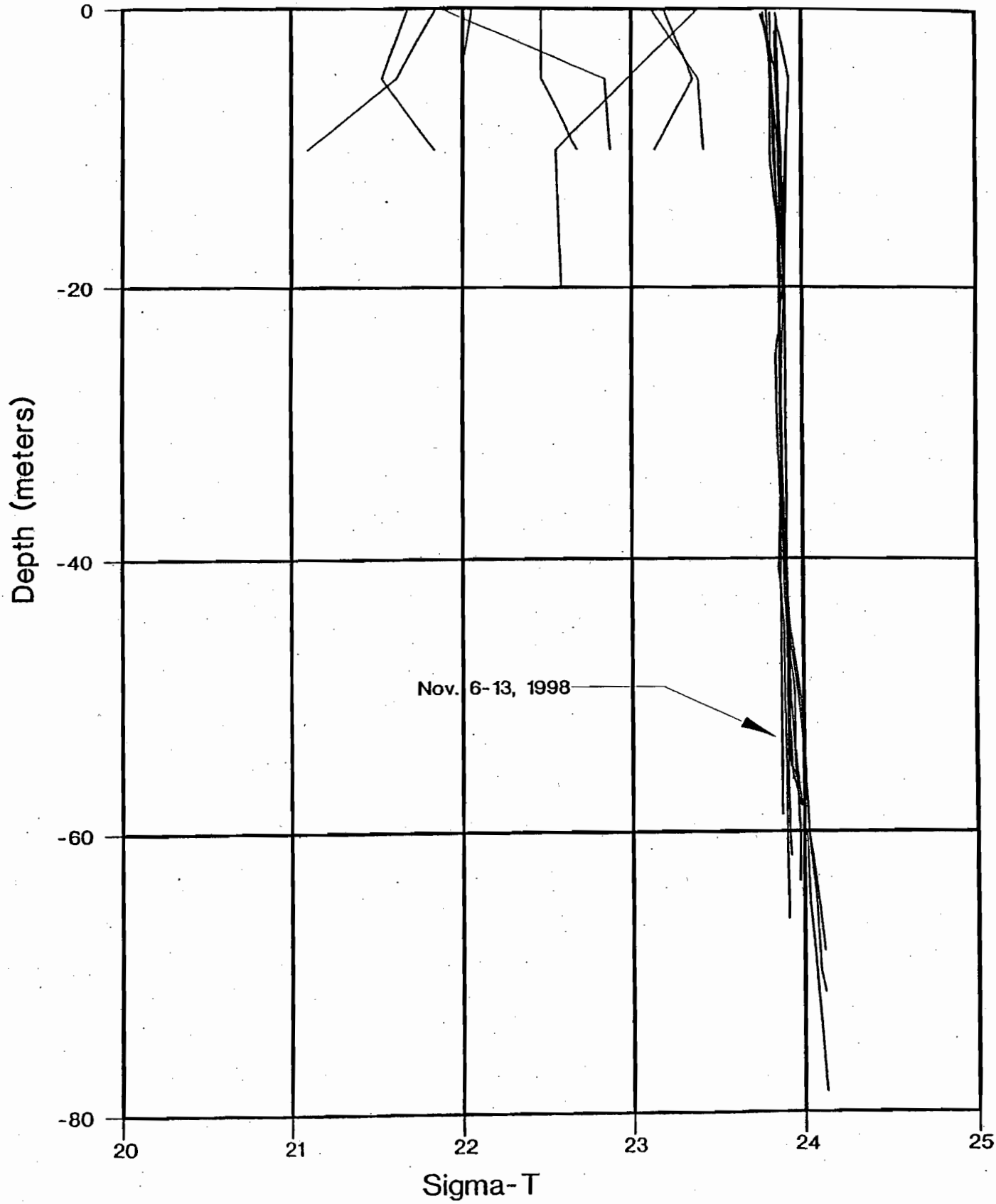
| MONTH | DAY | YEAR | DEPTH (meters) | DENSITY gm/cm^3 | TEMP (C) | SAL 0/00 | c. | Long. |
|---|---|---|---|---|---|---|---|---|
| 11 | 13 | 98 | 40.17 | 1.02389 | 29.01 | 37.43 | 13 29 13.51N | 144 44 54.85E |
| 11 | 13 | 98 | 43.21 | 1.02389 | 29.01 | 37.43 | 13 29 13.51N | 144 44 54.85E |
| 11 | 13 | 98 | 1.48 | 1.02386 | 29.02 | 37.39 | 13 29 13.60N | 144 44 50.56E |
| 11 | 13 | 98 | 5.14 | 1.02386 | 29.01 | 37.40 | 13 29 13.60N | 144 44 50.56E |
| 11 | 13 | 98 | 10.12 | 1.02387 | 28.99 | 37.39 | 13 29 13.60N | 144 44 50.56E |
| 11 | 13 | 98 | 15.20 | 1.02388 | 28.98 | 37.40 | 13 29 13.60N | 144 44 50.56E |
| 11 | 13 | 98 | 20.14 | 1.02388 | 28.99 | 37.41 | 13 29 13.60N | 144 44 50.56E |
| 11 | 13 | 98 | 25.12 | 1.02389 | 29.01 | 37.43 | 13 29 13.60N | 144 44 50.56E |
| 11 | 13 | 98 | 30.00 | 1.02389 | 29.01 | 37.44 | 13 29 13.60N | 144 44 50.56E |
| 11 | 13 | 98 | 35.09 | 1.02389 | 29.01 | 37.44 | 13 29 13.60N | 144 44 50.56E |
| 11 | 13 | 98 | 40.07 | 1.02389 | 29.02 | 37.44 | 13 29 13.60N | 144 44 50.56E |
| 11 | 13 | 98 | 44.73 | 1.02389 | 29.01 | 37.44 | 13 29 13.60N | 144 44 50.56E |

NORTHERN DISTRICT ..SSOLVED OXYGEN(DO) PROFIL. DATA OBTAINED DURING
NOV. 12-13, 1998 BY EDWARD K. NODA AND ASSOCIATES, INC.
(Lat. and Long. in WGS 83)

| MONTH | DAY | YEAR | DEPTH (meters) | DO Pct Sat | DO mg/l | TEMP (C) | Cond mS/cm | Turb NTUs | pH | ORP mV | Lat. | Long. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | 12 | 98 | 0.57 | 99.2 | 6.99 | 28.53 | 3.06 | 5 | 8.11 | 252 | 13 33 31.90N | 144 48 15.78E |
| 11 | 12 | 98 | 7.33 | 97.7 | 6.00 | 29.13 | 2.70 | 0 | 8.19 | 246 | 13 33 31.90N | 144 48 15.78E |
| 11 | 12 | 98 | 14.42 | 97.5 | 6.00 | 29.09 | 2.80 | 0 | 8.20 | 246 | 13 33 31.90N | 144 48 15.78E |
| 11 | 12 | 98 | 20.88 | 97.2 | 5.98 | 29.07 | 2.78 | 0 | 8.20 | 245 | 13 33 31.90N | 144 48 15.78E |
| 11 | 12 | 98 | 26.17 | 97.3 | 5.99 | 29.04 | 2.80 | 0 | 8.20 | 245 | 13 33 31.90N | 144 48 15.78E |
| 11 | 12 | 98 | 32.10 | 97.1 | 5.97 | 29.03 | 2.80 | 0 | 8.20 | 244 | 13 33 31.90N | 144 48 15.78E |
| 11 | 12 | 98 | 39.35 | 96.7 | 5.95 | 29.03 | 2.80 | 0 | 8.20 | 244 | 13 33 31.90N | 144 48 15.78E |
| 11 | 12 | 98 | 44.30 | 96.9 | 5.96 | 29.02 | 2.80 | 0 | 8.20 | 243 | 13 33 31.90N | 144 48 15.78E |
| 11 | 12 | 98 | 51.93 | 95.8 | 5.91 | 28.91 | 2.80 | 0 | 8.20 | 244 | 13 33 31.90N | 144 48 15.78E |
| 11 | 12 | 98 | 60.56 | 95.8 | 5.91 | 28.90 | 2.80 | 0 | 8.19 | 245 | 13 33 31.90N | 144 48 15.78E |
| 11 | 12 | 98 | 0.43 | 100.4 | 7.32 | 28.28 | 5.06 | 7 | 7.71 | 276 | 13 33 8.45N | 144 48 27.14E |
| 11 | 12 | 98 | 7.36 | 97.4 | 5.98 | 29.13 | 2.75 | 0 | 8.19 | 240 | 13 33 8.45N | 144 48 27.14E |
| 11 | 12 | 98 | 14.53 | 97.4 | 5.99 | 29.09 | 2.74 | 0 | 8.19 | 240 | 13 33 8.45N | 144 48 27.14E |
| 11 | 12 | 98 | 21.70 | 96.7 | 5.95 | 29.08 | 2.78 | 0 | 8.19 | 240 | 13 33 8.45N | 144 48 27.14E |
| 11 | 12 | 98 | 27.14 | 97.1 | 5.97 | 29.07 | 2.79 | 0 | 8.19 | 239 | 13 33 8.45N | 144 48 27.14E |
| 11 | 12 | 98 | 35.90 | 96.9 | 5.96 | 29.06 | 2.79 | 0 | 8.19 | 238 | 13 33 8.45N | 144 48 27.14E |
| 11 | 12 | 98 | 43.27 | 97.7 | 6.01 | 29.05 | 2.80 | 0 | 8.19 | 237 | 13 33 8.45N | 144 48 27.14E |
| 11 | 12 | 98 | 56.10 | 96.7 | 5.95 | 29.03 | 2.80 | 0 | 8.18 | 238 | 13 33 8.45N | 144 48 27.14E |
| 11 | 12 | 98 | 62.43 | 96.3 | 5.93 | 28.98 | 2.80 | 0 | 8.17 | 240 | 13 33 8.45N | 144 48 27.14E |
| 11 | 13 | 98 | 0.43 | 98.0 | 7.46 | 27.25 | 8.21 | 39 | 7.89 | 253 | 13 33 22.88N | 144 48 11.38E |
| 11 | 13 | 98 | 12.80 | 97.6 | 6.00 | 29.06 | 2.80 | 0 | 8.16 | 238 | 13 33 22.88N | 144 48 11.38E |
| 11 | 13 | 98 | 19.65 | 98.2 | 6.04 | 29.05 | 2.80 | 0 | 8.16 | 241 | 13 33 22.88N | 144 48 11.38E |
| 11 | 13 | 98 | 27.81 | 98.3 | 6.04 | 29.06 | 2.80 | 0 | 8.15 | 246 | 13 33 22.88N | 144 48 11.38E |
| 11 | 13 | 98 | 35.24 | 98.5 | 6.06 | 29.05 | 2.80 | 0 | 8.15 | 251 | 13 33 22.88N | 144 48 11.38E |
| 11 | 13 | 98 | 46.98 | 98.1 | 6.03 | 29.03 | 2.80 | 0 | 8.14 | 256 | 13 33 22.88N | 144 48 11.38E |
| 11 | 13 | 98 | 60.52 | 96.6 | 5.95 | 28.99 | 2.80 | 0 | 8.13 | 265 | 13 33 22.88N | 144 48 11.38E |

# NORTHERN DISTRICT WWTP DIFFUSER SITE DENSITY DATA

| MONTH | DEPTH (meters) | DENSITY gm/cm^3 | TEMP (C) | SAL 0/00 | DAY | YEAR | DATA SOURCE | STATION |
|---|---|---|---|---|---|---|---|---|
| 4 | 0 | 1.02205 | 26.8 | 34.0 | 25 | 89 | Matson, A. E. (1990) | E |
| 4 | 5 | 1.02199 | 27.0 | 34.0 | 25 | 89 | Matson, A. E. (1990) | E |
| 4 | 10 | 1.02199 | 27.0 | 34.0 | 25 | 89 | Matson, A. E. (1990) | E |
| 4 | 0 | 1.02340 | 27.3 | 36.0 | 6 | 98 | Gov. of Guam, Water Quality Data | TANG |
| 4 | 10 | 1.02255 | 27.6 | 35.0 | 6 | 98 | Gov. of Guam, Water Quality Data | TANG |
| 4 | 20 | 1.02258 | 27.5 | 35.0 | 6 | 98 | Gov. of Guam, Water Quality Data | TANG |
| 4 | 10 | 1.02173 | 27.8 | 34.0 | 27 | 98 | Gov. of Guam, Water Quality Data | TANG |
| 4 | 20 | 1.02167 | 28.0 | 34.0 | 27 | 98 | Gov. of Guam, Water Quality Data | TANG |
| 6 | 0 | 1.02312 | 27.7 | 35.8 | 13 | 89 | Matson, A. E. (1990) | D |
| 6 | 5 | 1.02340 | 27.3 | 36.0 | 13 | 89 | Matson, A. E. (1990) | D |
| 6 | 10 | 1.02343 | 27.2 | 36.0 | 13 | 89 | Matson, A. E. (1990) | D |
| 6 | 0 | 1.02319 | 27.7 | 35.9 | 13 | 89 | Matson, A. E. (1990) | E |
| 6 | 5 | 1.02337 | 27.4 | 36.0 | 13 | 89 | Matson, A. E. (1990) | E |
| 6 | 10 | 1.02314 | 27.4 | 35.7 | 13 | 89 | Matson, A. E. (1990) | E |
| 9 | 0 | 1.02186 | 29.9 | 35.1 | 21 | 89 | Matson, A. E. (1990) | D |
| 9 | 5 | 1.02284 | 29.0 | 36.0 | 21 | 89 | Matson, A. E. (1990) | D |
| 9 | 10 | 1.02287 | 28.9 | 36.0 | 21 | 89 | Matson, A. E. (1990) | D |
| 9 | 0 | 1.02246 | 29.0 | 35.5 | 21 | 89 | Matson, A. E. (1990) | E |
| 9 | 5 | 1.02246 | 29.0 | 35.5 | 21 | 89 | Matson, A. E. (1990) | E |
| 9 | 10 | 1.02268 | 28.8 | 35.7 | 21 | 89 | Matson, A. E. (1990) | E |
| 12 | 0 | 1.02169 | 30.4 | 35.1 | 12 | 89 | Matson, A. E. (1990) | C |
| 12 | 5 | 1.02154 | 30.4 | 34.9 | 12 | 89 | Matson, A. E. (1990) | C |
| 12 | 10 | 1.02184 | 30.4 | 35.3 | 12 | 89 | Matson, A. E. (1990) | C |
| 12 | 0 | 1.02140 | 30.8 | 34.9 | 12 | 89 | Matson, A. E. (1990) | D |
| 12 | 5 | 1.02138 | 30.2 | 34.6 | 12 | 89 | Matson, A. E. (1990) | D |
| 12 | 10 | 1.02056 | 30.2 | 33.5 | 12 | 89 | Matson, A. E. (1990) | D |
| 12 | 0 | 1.02184 | 29.5 | 34.9 | 12 | 89 | Matson, A. E. (1990) | E |
| 12 | 5 | 1.02162 | 29.5 | 34.6 | 12 | 89 | Matson, A. E. (1990) | E |
| 12 | 10 | 1.02109 | 29.5 | 33.9 | 12 | 89 | Matson, A. E. (1990) | E |




ND 1482

| | | | |
|---|---|---|---|
| Edward K. Noda | NORTHERN DISTRICT SEWAGE TREATMENT | Northern District STP Historic | FIGURE |

NORTHERN DISTRIC WWTP DENSITY PROFILE DATA BTAINED DURING
NOV. 6-13, 1998 BY EDWARD K. NODA AND ASSOCIATES, INC.
(Lat. and Long. in WGS 83)

| MONTH | DAY | YEAR | DEPTH (meters) | DENSITY gm/cm^3 | TEMP (C) | SAL 0/00 | Lat. | Long. |
|---|---|---|---|---|---|---|---|---|
| 11 | 6 | 98 | 0.17 | 1.02380 | 29.21 | 37.40 | 13 32 45.88N | 144 48 9.72E |
| 11 | 6 | 98 | 5.25 | 1.02381 | 29.18 | 37.41 | 13 32 45.88N | 144 48 9.72E |
| 11 | 6 | 98 | 10.62 | 1.02382 | 29.16 | 37.40 | 13 32 45.88N | 144 48 9.72E |
| 11 | 6 | 98 | 15.50 | 1.02386 | 29.08 | 37.42 | 13 32 45.88N | 144 48 9.72E |
| 11 | 6 | 98 | 20.04 | 1.02388 | 29.06 | 37.44 | 13 32 45.88N | 144 48 9.72E |
| 11 | 6 | 98 | 25.22 | 1.02385 | 29.12 | 37.42 | 13 32 45.88N | 144 48 9.72E |
| 11 | 6 | 98 | 30.41 | 1.02385 | 29.08 | 37.41 | 13 32 45.88N | 144 48 9.72E |
| 11 | 6 | 98 | 35.59 | 1.02387 | 29.09 | 37.44 | 13 32 45.88N | 144 48 9.72E |
| 11 | 6 | 98 | 40.65 | 1.02386 | 29.05 | 37.41 | 13 32 45.88N | 144 48 9.72E |
| 11 | 6 | 98 | 45.13 | 1.02389 | 29.01 | 37.43 | 13 32 45.88N | 144 48 9.72E |
| 11 | 6 | 98 | 50.02 | 1.02389 | 29.01 | 37.43 | 13 32 45.88N | 144 48 9.72E |
| 11 | 6 | 98 | 55.52 | 1.02390 | 28.99 | 37.43 | 13 32 45.88N | 144 48 9.72E |
| 11 | 6 | 98 | 60.31 | 1.02390 | 28.97 | 37.43 | 13 32 45.88N | 144 48 9.72E |
| 11 | 6 | 98 | 65.09 | 1.02391 | 28.96 | 37.44 | 13 32 45.88N | 144 48 9.72E |
| 11 | 6 | 98 | 66.42 | 1.02391 | 28.97 | 37.44 | 13 32 45.88N | 144 48 9.72E |
| 11 | 8 | 98 | 0.92 | 1.02378 | 29.21 | 37.38 | 13 33 13.58N | 144 48 23.23E |
| 11 | 8 | 98 | 5.55 | 1.02387 | 29.10 | 37.44 | 13 33 13.58N | 144 48 23.23E |
| 11 | 8 | 98 | 10.02 | 1.02387 | 29.09 | 37.44 | 13 33 13.58N | 144 48 23.23E |
| 11 | 8 | 98 | 15.36 | 1.02387 | 29.08 | 37.44 | 13 33 13.58N | 144 48 23.23E |
| 11 | 8 | 98 | 20.27 | 1.02387 | 29.08 | 37.44 | 13 33 13.58N | 144 48 23.23E |
| 11 | 8 | 98 | 25.32 | 1.02387 | 29.09 | 37.45 | 13 33 13.58N | 144 48 23.23E |
| 11 | 8 | 98 | 30.20 | 1.02387 | 29.10 | 37.45 | 13 33 13.58N | 144 48 23.23E |
| 11 | 8 | 98 | 35.59 | 1.02387 | 29.10 | 37.44 | 13 33 13.58N | 144 48 23.23E |
| 11 | 8 | 98 | 40.37 | 1.02387 | 29.09 | 37.44 | 13 33 13.58N | 144 48 23.23E |
| 11 | 8 | 98 | 45.03 | 1.02387 | 29.08 | 37.44 | 13 33 13.58N | 144 48 23.23E |
| 11 | 8 | 98 | 50.43 | 1.02387 | 29.08 | 37.44 | 13 33 13.58N | 144 48 23.23E |
| 11 | 8 | 98 | 55.52 | 1.02387 | 29.08 | 37.44 | 13 33 13.58N | 144 48 23.23E |
| 11 | 8 | 98 | 56.02 | 1.02387 | 29.08 | 37.44 | 13 33 13.58N | 144 48 23.23E |
| 11 | 8 | 98 | 0.37 | 1.02376 | 29.23 | 37.35 | 13 33 14.45N | 144 48 22.43E |
| 11 | 8 | 98 | 5.45 | 1.02386 | 29.10 | 37.44 | 13 33 14.45N | 144 48 22.43E |
| 11 | 8 | 98 | 10.79 | 1.02386 | 29.09 | 37.43 | 13 33 14.45N | 144 48 22.43E |
| 11 | 8 | 98 | 15.10 | 1.02387 | 29.08 | 37.43 | 13 33 14.45N | 144 48 22.43E |
| 11 | 8 | 98 | 20.34 | 1.02387 | 29.08 | 37.44 | 13 33 14.45N | 144 48 22.43E |
| 11 | 8 | 98 | 25.42 | 1.02387 | 29.08 | 37.44 | 13 33 14.45N | 144 48 22.43E |
| 11 | 8 | 98 | 30.41 | 1.02387 | 29.10 | 37.45 | 13 33 14.45N | 144 48 22.43E |
| 11 | 8 | 98 | 35.16 | 1.02387 | 29.10 | 37.45 | 13 33 14.45N | 144 48 22.43E |
| 11 | 8 | 98 | 40.57 | 1.02387 | 29.10 | 37.45 | 13 33 14.45N | 144 48 22.43E |
| 11 | 8 | 98 | 45.26 | 1.02387 | 29.10 | 37.45 | 13 33 14.45N | 144 48 22.43E |
| 11 | 8 | 98 | 50.33 | 1.02387 | 29.08 | 37.44 | 13 33 14.45N | 144 48 22.43E |
| 11 | 8 | 98 | 55.53 | 1.02388 | 29.08 | 37.44 | 13 33 14.45N | 144 48 22.43E |
| 11 | 8 | 98 | 58.87 | 1.02387 | 29.08 | 37.44 | 13 33 14.45N | 144 48 22.43E |
| 11 | 9 | 98 | 0.27 | 1.02377 | 29.06 | 37.30 | 13 33 16.16N | 144 48 20.25E |
| 11 | 9 | 98 | 5.25 | 1.02383 | 29.09 | 37.38 | 13 33 16.16N | 144 48 20.25E |
| 11 | 9 | 98 | 10.02 | 1.02385 | 29.09 | 37.41 | 13 33 16.16N | 144 48 20.25E |
| 11 | 9 | 98 | 15.10 | 1.02386 | 29.08 | 37.42 | 13 33 16.16N | 144 48 20.25E |
| 11 | 9 | 98 | 20.04 | 1.02386 | 29.08 | 37.43 | 13 33 16.16N | 144 48 20.25E |
| 11 | 9 | 98 | 25.22 | 1.02387 | 29.08 | 37.43 | 13 33 16.16N | 144 48 20.25E |
| 11 | 9 | 98 | 30.20 | 1.02387 | 29.08 | 37.44 | 13 33 16.16N | 144 48 20.25E |
| 11 | 9 | 98 | 35.06 | 1.02387 | 29.05 | 37.43 | 13 33 16.16N | 144 48 20.25E |
| 11 | 9 | 98 | 40.27 | 1.02389 | 29.02 | 37.44 | 13 33 16.16N | 144 48 20.25E |
| 11 | 9 | 98 | 45.26 | 1.02393 | 28.91 | 37.44 | 13 33 16.16N | 144 48 20.25E |
| 11 | 9 | 98 | 50.14 | 1.02398 | 28.78 | 37.45 | 13 33 16.16N | 144 48 20.25E |

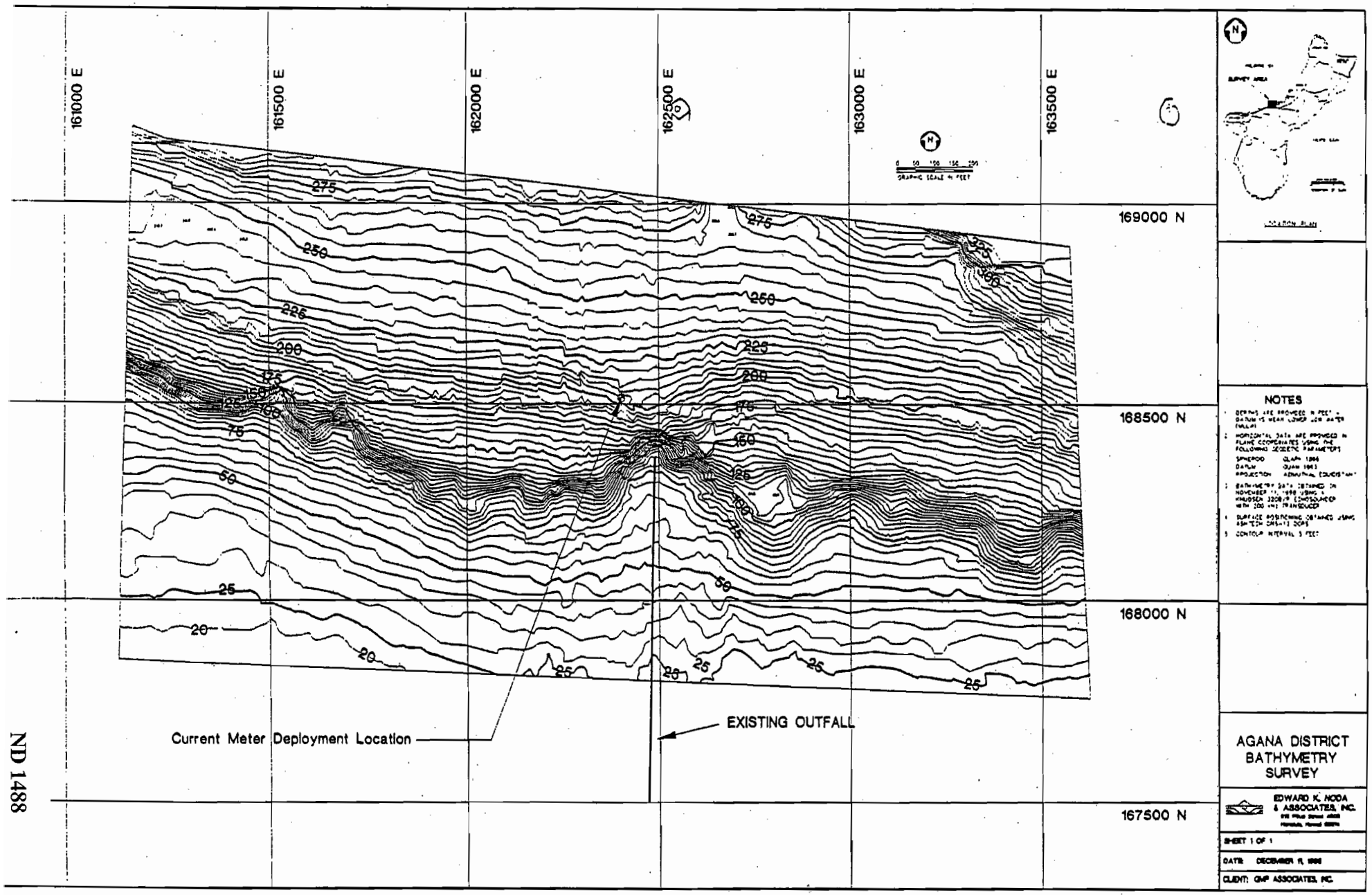
| MONTH | DAY | YEAR | DEPTH (meters) | DENSITY gm/cm^3 | TEMP (C) | SAL 0/00 | | Long. |
|---|---|---|---|---|---|---|---|---|
| 11 | 9 | 98 | 55.11 | 1.02401 | 28.70 | 37.45 | 13 33 16.16N | 144 48 20.25E |
| 11 | 9 | 98 | 60.10 | 1.02403 | 28.65 | 37.46 | 13 33 16.16N | 144 48 20.25E |
| 11 | 9 | 98 | 65.39 | 1.02409 | 28.50 | 37.47 | 13 33 16.16N | 144 48 20.25E |
| 11 | 9 | 98 | 68.65 | 1.02412 | 28.47 | 37.49 | 13 33 16.16N | 144 48 20.25E |
| 11 | 9 | 98 | 0.57 | 1.02386 | 29.10 | 37.43 | 13 33 16.48N | 144 48 19.88E |
| 11 | 9 | 98 | 5.04 | 1.02386 | 29.09 | 37.43 | 13 33 16.48N | 144 48 19.88E |
| 11 | 9 | 98 | 10.28 | 1.02387 | 29.09 | 37.43 | 13 33 16.48N | 144 48 19.88E |
| 11 | 9 | 98 | 15.30 | 1.02387 | 29.08 | 37.43 | 13 33 16.48N | 144 48 19.88E |
| 11 | 9 | 98 | 20.44 | 1.02387 | 29.08 | 37.44 | 13 33 16.48N | 144 48 19.88E |
| 11 | 9 | 98 | 25.32 | 1.02387 | 29.08 | 37.44 | 13 33 16.48N | 144 48 19.88E |
| 11 | 9 | 98 | 30.30 | 1.02387 | 29.08 | 37.44 | 13 33 16.48N | 144 48 19.88E |
| 11 | 9 | 98 | 35.19 | 1.02388 | 29.06 | 37.44 | 13 33 16.48N | 144 48 19.88E |
| 11 | 9 | 98 | 40.25 | 1.02389 | 29.02 | 37.44 | 13 33 16.48N | 144 48 19.88E |
| 11 | 9 | 98 | 45.26 | 1.02392 | 28.93 | 37.43 | 13 33 16.48N | 144 48 19.88E |
| 11 | 9 | 98 | 50.14 | 1.02397 | 28.85 | 37.46 | 13 33 16.48N | 144 48 19.88E |
| 11 | 9 | 98 | 55.01 | 1.02400 | 28.71 | 37.45 | 13 33 16.48N | 144 48 19.88E |
| 11 | 9 | 98 | 60.31 | 1.02403 | 28.67 | 37.46 | 13 33 16.48N | 144 48 19.88E |
| 11 | 9 | 98 | 65.20 | 1.02407 | 28.52 | 37.46 | 13 33 16.48N | 144 48 19.88E |
| 11 | 9 | 98 | 70.09 | 1.02409 | 28.48 | 37.47 | 13 33 16.48N | 144 48 19.88E |
| 11 | 9 | 98 | 71.61 | 1.02412 | 28.47 | 37.50 | 13 33 16.48N | 144 48 19.88E |
| 11 | 9 | 98 | 1.42 | 1.02386 | 29.09 | 37.43 | 13 33 16.70N | 144 48 18.98E |
| 11 | 9 | 98 | 5.25 | 1.02386 | 29.09 | 37.43 | 13 33 16.70N | 144 48 18.98E |
| 11 | 9 | 98 | 10.28 | 1.02387 | 29.09 | 37.44 | 13 33 16.70N | 144 48 18.98E |
| 11 | 9 | 98 | 15.20 | 1.02387 | 29.08 | 37.44 | 13 33 16.70N | 144 48 18.98E |
| 11 | 9 | 98 | 20.14 | 1.02387 | 29.08 | 37.44 | 13 33 16.70N | 144 48 18.98E |
| 11 | 9 | 98 | 25.22 | 1.02387 | 29.08 | 37.44 | 13 33 16.70N | 144 48 18.98E |
| 11 | 9 | 98 | 30.20 | 1.02387 | 29.08 | 37.44 | 13 33 16.70N | 144 48 18.98E |
| 11 | 9 | 98 | 35.19 | 1.02388 | 29.05 | 37.44 | 13 33 16.70N | 144 48 18.98E |
| 11 | 9 | 98 | 40.15 | 1.02390 | 29.01 | 37.44 | 13 33 16.70N | 144 48 18.98E |
| 11 | 9 | 98 | 45.16 | 1.02391 | 28.98 | 37.45 | 13 33 16.70N | 144 48 18.98E |
| 11 | 9 | 98 | 50.12 | 1.02395 | 28.88 | 37.45 | 13 33 16.70N | 144 48 18.98E |
| 11 | 9 | 98 | 55.31 | 1.02395 | 28.85 | 37.44 | 13 33 16.70N | 144 48 18.98E |
| 11 | 9 | 98 | 60.31 | 1.02402 | 28.69 | 37.46 | 13 33 16.70N | 144 48 18.98E |
| 11 | 9 | 98 | 65.18 | 1.02403 | 28.64 | 37.45 | 13 33 16.70N | 144 48 18.98E |
| 11 | 9 | 98 | 70.09 | 1.02407 | 28.52 | 37.45 | 13 33 16.70N | 144 48 18.98E |
| 11 | 9 | 98 | 75.28 | 1.02411 | 28.45 | 37.47 | 13 33 16.70N | 144 48 18.98E |
| 11 | 9 | 98 | 78.64 | 1.02413 | 28.41 | 37.48 | 13 33 16.70N | 144 48 18.98E |
| 11 | 10 | 98 | 0.47 | 1.02380 | 29.16 | 37.38 | 13 33 3.73N | 144 48 15.88E |
| 11 | 10 | 98 | 5.25 | 1.02382 | 29.16 | 37.41 | 13 33 3.73N | 144 48 15.88E |
| 11 | 10 | 98 | 10.28 | 1.02384 | 29.12 | 37.41 | 13 33 3.73N | 144 48 15.88E |
| 11 | 10 | 98 | 15.20 | 1.02386 | 29.09 | 37.44 | 13 33 3.73N | 144 48 15.88E |
| 11 | 10 | 98 | 20.24 | 1.02387 | 29.09 | 37.44 | 13 33 3.73N | 144 48 15.88E |
| 11 | 10 | 98 | 25.25 | 1.02387 | 29.08 | 37.44 | 13 33 3.73N | 144 48 15.88E |
| 11 | 10 | 98 | 30.00 | 1.02387 | 29.08 | 37.44 | 13 33 3.73N | 144 48 15.88E |
| 11 | 10 | 98 | 35.09 | 1.02388 | 29.07 | 37.44 | 13 33 3.73N | 144 48 15.88E |
| 11 | 10 | 98 | 40.05 | 1.02388 | 29.05 | 37.44 | 13 33 3.73N | 144 48 15.88E |
| 11 | 10 | 98 | 45.16 | 1.02390 | 29.01 | 37.45 | 13 33 3.73N | 144 48 15.88E |
| 11 | 10 | 98 | 50.24 | 1.02391 | 29.01 | 37.45 | 13 33 3.73N | 144 48 15.88E |
| 11 | 10 | 98 | 55.01 | 1.02392 | 28.97 | 37.45 | 13 33 3.73N | 144 48 15.88E |
| 11 | 10 | 98 | 58.26 | 1.02398 | 28.87 | 37.49 | 13 33 3.73N | 144 48 15.88E |
| 11 | 10 | 98 | 0.57 | 1.02385 | 29.28 | 37.50 | 13 33 7.57N | 144 48 16.14E |
| 11 | 10 | 98 | 5.14 | 1.02393 | 29.11 | 37.53 | 13 33 7.57N | 144 48 16.14E |
| 11 | 10 | 98 | 10.22 | 1.02391 | 29.11 | 37.50 | 13 33 7.57N | 144 48 16.14E |
| 11 | 10 | 98 | 15.30 | 1.02389 | 29.11 | 37.47 | 13 33 7.57N | 144 48 16.14E |
| 11 | 10 | 98 | 20.27 | 1.02389 | 29.09 | 37.46 | 13 33 7.57N | 144 48 16.14E |
| 11 | 10 | 98 | 25.32 | 1.02388 | 29.08 | 37.45 | 13 33 7.57N | 144 48 16.14E |
| 11 | 10 | 98 | 30.10 | 1.02388 | 29.06 | 37.44 | 13 33 7.57N | 144 48 16.14E |

| MONTH | DAY | YEAR | DEPTH (meters) | DENSITY gm/cm^3 | TEMP (C) | SAL 0/00 | Lat. | Long. |
|---|---|---|---|---|---|---|---|---|
| 11 | 10 | 98 | 35.06 | 1.02389 | 29.03 | 37.44 | 13 33 7.57N | 144 48 16.14E |
| 11 | 10 | 98 | 40.17 | 1.02390 | 28.99 | 37.44 | 13 33 7.57N | 144 48 16.14E |
| 11 | 10 | 98 | 45.16 | 1.02392 | 28.95 | 37.45 | 13 33 7.57N | 144 48 16.14E |
| 11 | 10 | 98 | 50.22 | 1.02393 | 28.93 | 37.45 | 13 33 7.57N | 144 48 16.14E |
| 11 | 10 | 98 | 55.11 | 1.02395 | 28.86 | 37.45 | 13 33 7.57N | 144 48 16.14E |
| 11 | 10 | 98 | 60.10 | 1.02397 | 28.81 | 37.45 | 13 33 7.57N | 144 48 16.14E |
| 11 | 10 | 98 | 63.66 | 1.02397 | 28.81 | 37.45 | 13 33 7.57N | 144 48 16.14E |
| 11 | 12 | 98 | 1.58 | 1.02384 | 29.10 | 37.41 | 13 33 27.54N | 144 48 8.97E |
| 11 | 12 | 98 | 5.14 | 1.02385 | 29.09 | 37.41 | 13 33 27.54N | 144 48 8.97E |
| 11 | 12 | 98 | 10.12 | 1.02388 | 29.06 | 37.44 | 13 33 27.54N | 144 48 8.97E |
| 11 | 12 | 98 | 15.10 | 1.02388 | 29.04 | 37.44 | 13 33 27.54N | 144 48 8.97E |
| 11 | 12 | 98 | 20.34 | 1.02389 | 29.02 | 37.44 | 13 33 27.54N | 144 48 8.97E |
| 11 | 12 | 98 | 25.12 | 1.02390 | 29.01 | 37.45 | 13 33 27.54N | 144 48 8.97E |
| 11 | 12 | 98 | 30.10 | 1.02391 | 29.00 | 37.45 | 13 33 27.54N | 144 48 8.97E |
| 11 | 12 | 98 | 35.29 | 1.02391 | 28.99 | 37.45 | 13 33 27.54N | 144 48 8.97E |
| 11 | 12 | 98 | 40.05 | 1.02391 | 28.99 | 37.45 | 13 33 27.54N | 144 48 8.97E |
| 11 | 12 | 98 | 45.05 | 1.02391 | 28.98 | 37.45 | 13 33 27.54N | 144 48 8.97E |
| 11 | 12 | 98 | 50.33 | 1.02392 | 28.97 | 37.45 | 13 33 27.54N | 144 48 8.97E |
| 11 | 12 | 98 | 55.21 | 1.02393 | 28.93 | 37.45 | 13 33 27.54N | 144 48 8.97E |
| 11 | 12 | 98 | 56.65 | 1.02397 | 28.89 | 37.48 | 13 33 27.54N | 144 48 8.97E |
| 11 | 12 | 98 | 0.27 | 1.02382 | 29.09 | 37.37 | 13 33 32.24N | 144 48 14.25E |
| 11 | 12 | 98 | 5.14 | 1.02383 | 29.09 | 37.38 | 13 33 32.24N | 144 48 14.25E |
| 11 | 12 | 98 | 10.32 | 1.02387 | 29.06 | 37.42 | 13 33 32.24N | 144 48 14.25E |
| 11 | 12 | 98 | 15.10 | 1.02387 | 29.04 | 37.43 | 13 33 32.24N | 144 48 14.25E |
| 11 | 12 | 98 | 20.14 | 1.02389 | 29.02 | 37.44 | 13 33 32.24N | 144 48 14.25E |
| 11 | 12 | 98 | 25.15 | 1.02390 | 29.00 | 37.44 | 13 33 32.24N | 144 48 14.25E |
| 11 | 12 | 98 | 30.00 | 1.02390 | 29.00 | 37.44 | 13 33 32.24N | 144 48 14.25E |
| 11 | 12 | 98 | 35.19 | 1.02391 | 28.99 | 37.44 | 13 33 32.24N | 144 48 14.25E |
| 11 | 12 | 98 | 40.27 | 1.02391 | 28.98 | 37.45 | 13 33 32.24N | 144 48 14.25E |
| 11 | 12 | 98 | 45.16 | 1.02392 | 28.96 | 37.45 | 13 33 32.24N | 144 48 14.25E |
| 11 | 12 | 98 | 50.33 | 1.02393 | 28.94 | 37.45 | 13 33 32.24N | 144 48 14.25E |
| 11 | 12 | 98 | 55.01 | 1.02396 | 28.86 | 37.45 | 13 33 32.24N | 144 48 14.25E |
| 11 | 12 | 98 | 57.95 | 1.02398 | 28.82 | 37.47 | 13 33 32.24N | 144 48 14.25E |
| 11 | 12 | 98 | 0.31 | 1.02385 | 29.11 | 37.42 | 13 33 7.58N | 144 48 3.04E |
| 11 | 12 | 98 | 5.35 | 1.02386 | 29.09 | 37.43 | 13 33 7.58N | 144 48 3.04E |
| 11 | 12 | 98 | 10.12 | 1.02388 | 29.05 | 37.44 | 13 33 7.58N | 144 48 3.04E |
| 11 | 12 | 98 | 15.26 | 1.02389 | 29.03 | 37.44 | 13 33 7.58N | 144 48 3.04E |
| 11 | 12 | 98 | 20.24 | 1.02390 | 29.02 | 37.45 | 13 33 7.58N | 144 48 3.04E |
| 11 | 12 | 98 | 25.02 | 1.02391 | 29.01 | 37.45 | 13 33 7.58N | 144 48 3.04E |
| 11 | 12 | 98 | 30.30 | 1.02391 | 29.01 | 37.45 | 13 33 7.58N | 144 48 3.04E |
| 11 | 12 | 98 | 35.19 | 1.02390 | 29.01 | 37.45 | 13 33 7.58N | 144 48 3.04E |
| 11 | 12 | 98 | 40.17 | 1.02391 | 29.00 | 37.45 | 13 33 7.58N | 144 48 3.04E |
| 11 | 12 | 98 | 45.13 | 1.02391 | 28.99 | 37.45 | 13 33 7.58N | 144 48 3.04E |
| 11 | 12 | 98 | 50.14 | 1.02391 | 28.98 | 37.45 | 13 33 7.58N | 144 48 3.04E |
| 11 | 12 | 98 | 55.01 | 1.02393 | 28.95 | 37.46 | 13 33 7.58N | 144 48 3.04E |
| 11 | 12 | 98 | 56.33 | 1.02394 | 28.95 | 37.46 | 13 33 7.58N | 144 48 3.04E |
| 11 | 12 | 98 | 1.08 | 1.02385 | 29.10 | 37.42 | 13 33 8.23N | 144 48 3.20E |
| 11 | 12 | 98 | 5.00 | 1.02386 | 29.09 | 37.42 | 13 33 8.23N | 144 48 3.20E |
| 11 | 12 | 98 | 10.32 | 1.02387 | 29.07 | 37.43 | 13 33 8.23N | 144 48 3.20E |
| 11 | 12 | 98 | 15.30 | 1.02389 | 29.03 | 37.44 | 13 33 8.23N | 144 48 3.20E |
| 11 | 12 | 98 | 20.17 | 1.02389 | 29.03 | 37.44 | 13 33 8.23N | 144 48 3.20E |
| 11 | 12 | 98 | 25.22 | 1.02390 | 29.02 | 37.45 | 13 33 8.23N | 144 48 3.20E |
| 11 | 12 | 98 | 30.00 | 1.02390 | 29.01 | 37.45 | 13 33 8.23N | 144 48 3.20E |
| 11 | 12 | 98 | 35.26 | 1.02390 | 29.01 | 37.45 | 13 33 8.23N | 144 48 3.20E |
| 11 | 12 | 98 | 40.15 | 1.02391 | 29.01 | 37.45 | 13 33 8.23N | 144 48 3.20E |
| 11 | 12 | 98 | 45.03 | 1.02391 | 29.00 | 37.45 | 13 33 8.23N | 144 48 3.20E |

| MONTH | DAY | YEAR | DEPTH (meters) | DENSITY gm/cm^3 | TEMP (C) | SAL 0/00 | | Long. |
|---|---|---|---|---|---|---|---|---|
| 11 | 12 | 98 | 55.21 | 1.02391 | 28.99 | 37.45 | 13 33 8.23N | 144 48 3.20E |
| 11 | 12 | 98 | 60.09 | 1.02392 | 28.97 | 37.45 | 13 33 8.23N | 144 48 3.20E |
| 11 | 12 | 98 | 61.83 | 1.02392 | 28.97 | 37.46 | 13 33 8.23N | 144 48 3.20E |

# APPENDIX C:

# CURRENT METER MOORING STUDY RESULTS


161000 E
161500 E
162000 E
162500 E
163000 E
163500 E
169000 N
168500 N
168000 N
167500 N
275
250
225
200
175
150
125
100
75
50
25
20
Current Meter Deployment Location
EXISTING OUTFALL
NOTES
AGANA DISTRICT
BATHYMETRY
SURVEY
EDWARD K. NODA
& ASSOCIATES, INC.
SHEET 1 OF 1
CLIENT: GMP ASSOCIATES, INC.

ND 1488

GUAM AGANA WWTP DIFFUSER CURRENTS -- 1

CURRENT METER S/N -- 0705

METER POSITION ----- 1

DATA ACQUISITION
DEPLOYMENT DATE(GST) - NOV. 7 ,1998
DEPLOYMENT TIME(GST) - 1545

RETRIEVAL DATE(GST) --- NOV. 13,1998
RETRIEVAL TIME(GST) --- 1205

MOORING LOCATION
LATITUDE -------- 13-29.09N
LONGITUDE ------- 144-44.65E

SENSOR DEPTH(M) ---- 33

BOTTOM DEPTH(M) ---- 61

MAGNETIC DECLINATION(DEGREES) -- 1.8

DATA ANALYSIS
START DATE(GST) - NOV. 7 ,1998
START TIME(GST) - 1545

ENDING DATE(GST) - NOV. 13,1998
ENDING TIME(GST) - 1215

TIME INTERVAL(MIN) - 10.00

DISTRIBUTION FREQUENCY

.17 HOUR AVERAGES
DEPLOYMENT 1  METER POSITION 1
FROM 1545  7 NOV 1998 TO 1215 13 NOV 1998

| DIRECTION DEGREES TRUE | 33 METERS DEPTH | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0- 15 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 15- 30 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 30- 45 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 45- 60 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 60- 75 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 75- 90 | 11 | 10 | 7 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | |
| 90-105 | 25 | 48 | 33 | 17 | 6 | 0 | 0 | 0 | 0 | 0 | |
| 105-120 | 35 | 46 | 30 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 120-135 | 43 | 24 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 135-150 | 35 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 150-165 | 42 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 165-180 | 28 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 180-195 | 44 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 195-210 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 210-225 | 29 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 225-240 | 39 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 240-255 | 21 | 41 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 255-270 | 25 | 42 | 17 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 270-285 | 16 | 13 | 6 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 285-300 | 7 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 300-315 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 315-330 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 330-345 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 345-360 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| SPEED | 0 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | |
| CM/SEC | \| | \| | \| | \| | \| | \| | \| | \| | \| | \| | |
| | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0- 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 15- 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30- 45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 45- 60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 60- 75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 75- 90 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 90-105 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 105-120 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 120-135 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 135-150 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 150-165 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 165-180 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 180-195 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 195-210 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 210-225 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 225-240 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 240-255 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 255-270 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 270-285 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 285-300 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 300-315 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 315-330 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 330-345 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 345-360 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SPEED | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | |
| CM/SEC | \| | \| | \| | \| | \| | \| | \| | \| | \| | \| | >100 |
| | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | 100 | |

SUMMARY STATISTICS

DEPLOYMENT 1  METER POSITION 1

FROM 1545  7 NOV 1998 TO 1215 13 NOV 1998

| DIRECTION(DEGREES TRUE) | TOTAL OBSERVATIONS | PERCENT |
|---|---|---|
| 0 TO 15 | 8 | .95 |
| 15 TO 30 | 2 | .24 |
| 30 TO 45 | 3 | .36 |
| 45 TO 60 | 4 | .47 |
| 60 TO 75 | 7 | .83 |
| 75 TO 90 | 34 | 4.03 |
| 90 TO 105 | 129 | 15.28 |
| 105 TO 120 | 112 | 13.27 |
| 120 TO 135 | 68 | 8.06 |
| 135 TO 150 | 40 | 4.74 |
| 150 TO 165 | 44 | 5.21 |
| 165 TO 180 | 29 | 3.44 |
| 180 TO 195 | 44 | 5.21 |
| 195 TO 210 | 22 | 2.61 |
| 210 TO 225 | 32 | 3.79 |
| 225 TO 240 | 47 | 5.57 |
| 240 TO 255 | 72 | 8.53 |
| 255 TO 270 | 92 | 10.90 |
| 270 TO 285 | 36 | 4.27 |
| 285 TO 300 | 10 | 1.18 |
| 300 TO 315 | 3 | .36 |
| 315 TO 330 | 2 | .24 |
| 330 TO 345 | 2 | .24 |
| 345 TO 360 | 2 | .24 |

| SPEED(CM/SEC) | TOTAL OBSERVATIONS | PERCENT |
|---|---|---|
| 0.0 TO 5.0 | 451 | 53.44 |
| 5.0 TO 10.0 | 250 | 29.62 |
| 10.0 TO 15.0 | 104 | 12.32 |
| 15.0 TO 20.0 | 30 | 3.55 |
| 20.0 TO 25.0 | 9 | 1.07 |
| 25.0 TO 30.0 | 0 | 0.00 |
| 30.0 TO 35.0 | 0 | 0.00 |
| 35.0 TO 40.0 | 0 | 0.00 |
| 40.0 TO 45.0 | 0 | 0.00 |
| 45.0 TO 50.0 | 0 | 0.00 |
| 50.0 TO 55.0 | 0 | 0.00 |
| 55.0 TO 60.0 | 0 | 0.00 |
| 60.0 TO 65.0 | 0 | 0.00 |
| 65.0 TO 70.0 | 0 | 0.00 |
| 70.0 TO 75.0 | 0 | 0.00 |
| 75.0 TO 80.0 | 0 | 0.00 |
| 80.0 TO 85.0 | 0 | 0.00 |
| 85.0 TO 90.0 | 0 | 0.00 |
| 90.0 TO 95.0 | 0 | 0.00 |
| 95.0 TO 100.0 | 0 | 0.00 |
| ABOVE 100 | 0 | 0.00 |

TOTAL NUMBER OF POINTS READ = 844

TOTAL NUMBER OF OBSERVATIONS USED IN THE DISTRIBUTIONS = 844

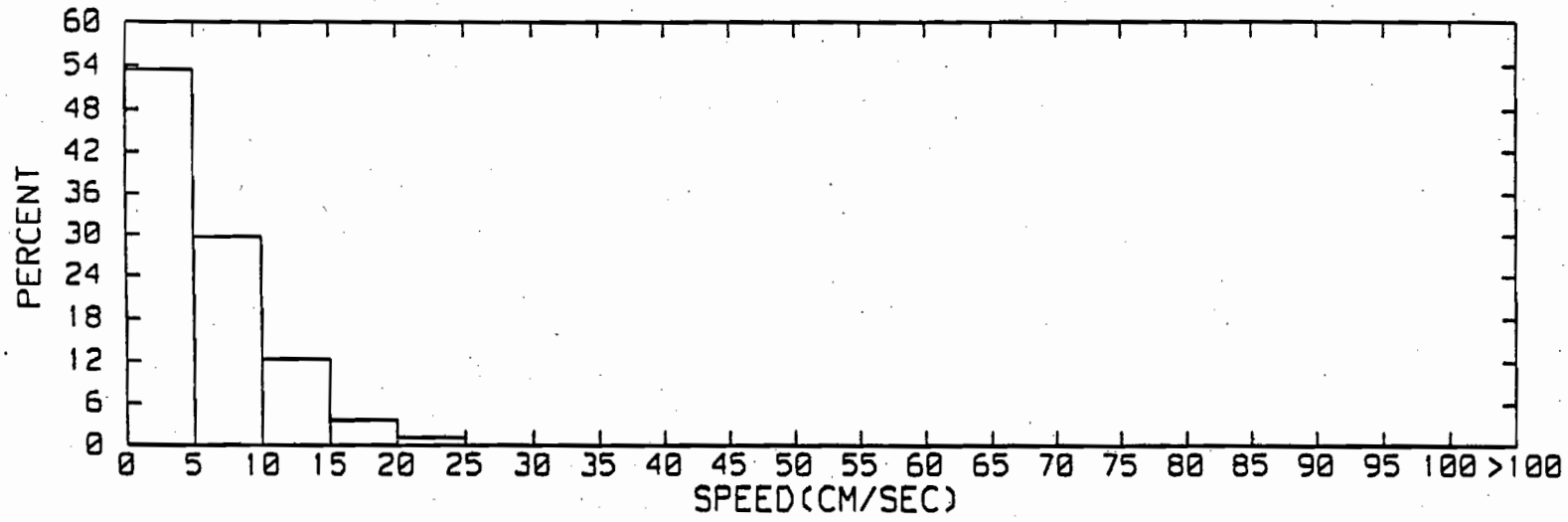
MEAN SPEED = 5.90 CM/SEC

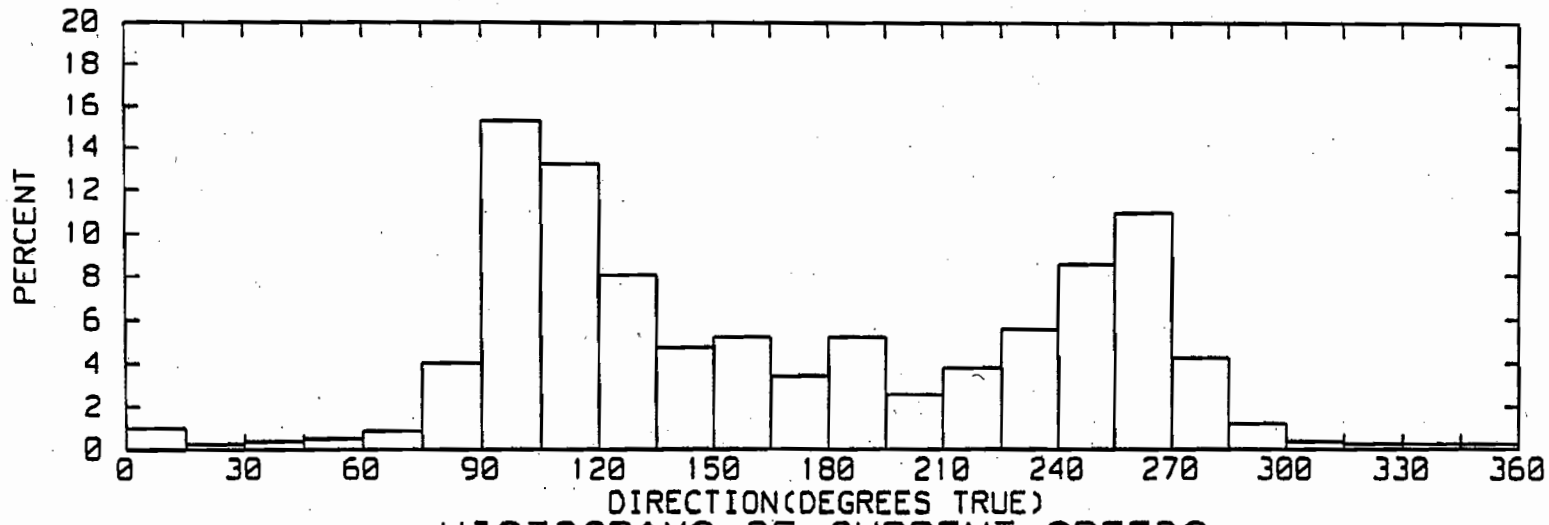
STANDARD DEVIATION = 4.36 CM/SEC

MAXIMUM SPEED = 24.20 CM/SEC

MINIMUM SPEED = 0.00 CM/SEC

RANGE = 24.20 CM/SEC

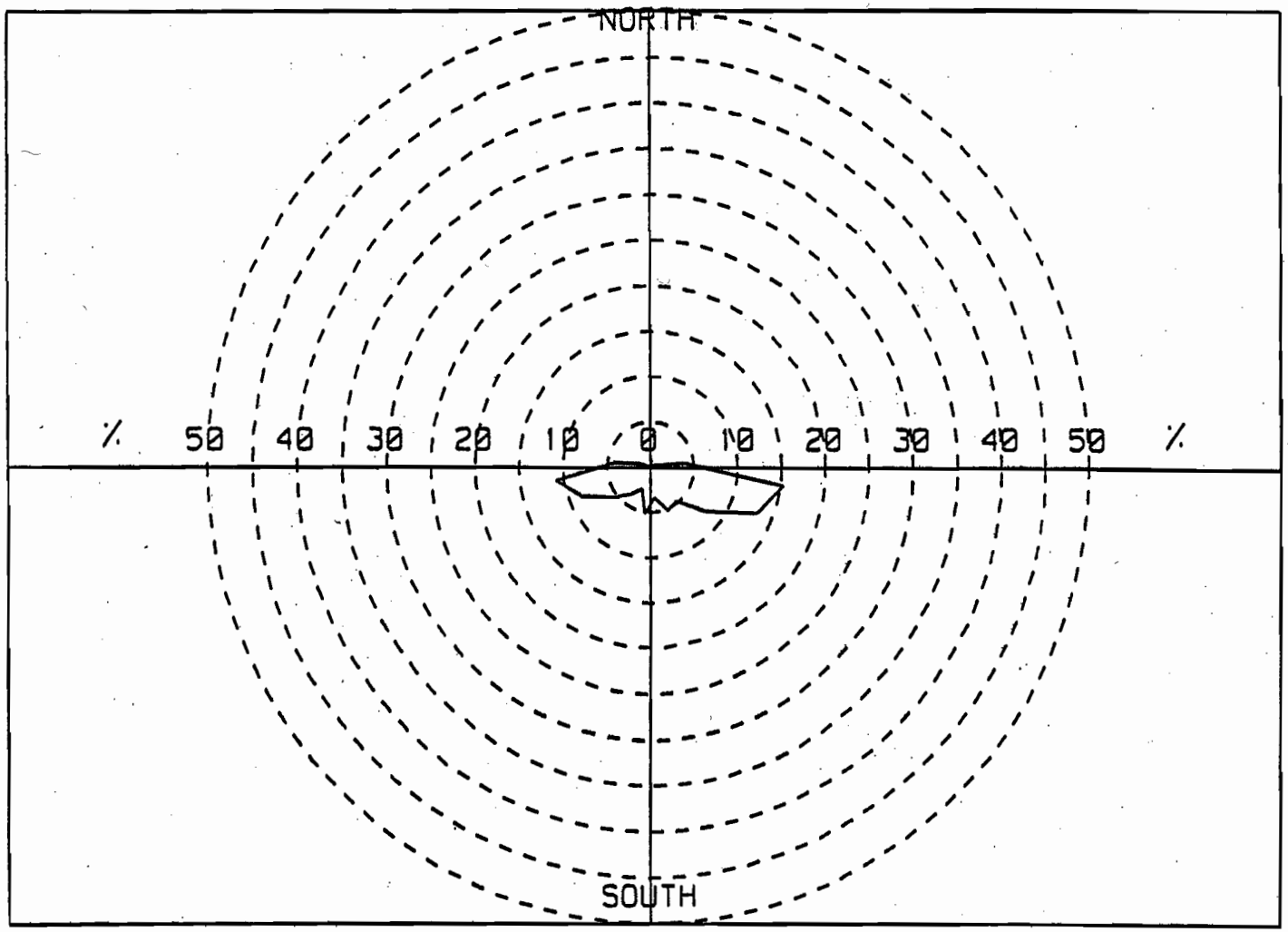



HISTOGRAMS OF CURRENT SPEEDS

(GST) 1545 NOV 7 1998 TO 1215 NOV 13 1998

LATITUDE: 13-29.09N LONGITUDE: 144-44.65E NOMINAL DEPTH(M): 33




PERCENT OCCURRENCE VS DIRECTION(DEG TRUE)

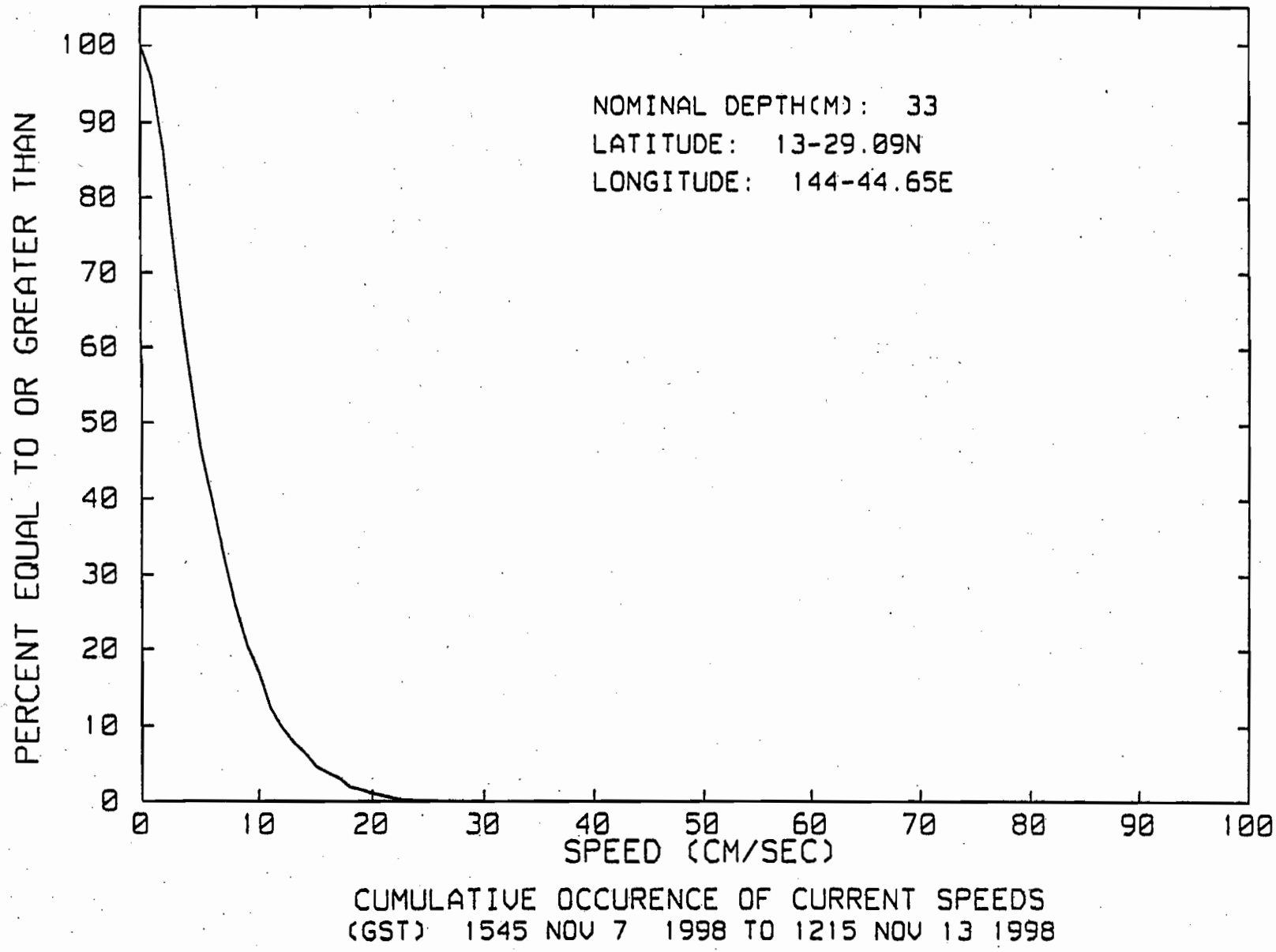
(GST) 1545 NOV 7 1998 TO 1215 NOV 13 1998

LATITUDE: 13-29.09N LONGITUDE: 144-44.65E NOMINAL DEPTH(M): 33

LATITUDE: 13-29.09N
LONGITUDE: 144-44.65E
NOMINAL DEPTH(METERS): 33
TIME SPAN(GST): 1545 NOV 7 1998 TO 1215 NOV 13 1998

CUMULATIVE OCCURENCE OF CURRENT SPEEDS

| SPEED (CM/SEC) | PERCENT EQUAL TO OR GREATER THAN |
|---|---|
| 0 | 100.000 |
| 3 | 70.616 |
| 6 | 39.929 |
| 9 | 20.498 |
| 12 | 9.834 |
| 15 | 4.621 |
| 18 | 1.896 |
| 21 | .711 |
| 24 | .118 |
| 27 | 0.000 |

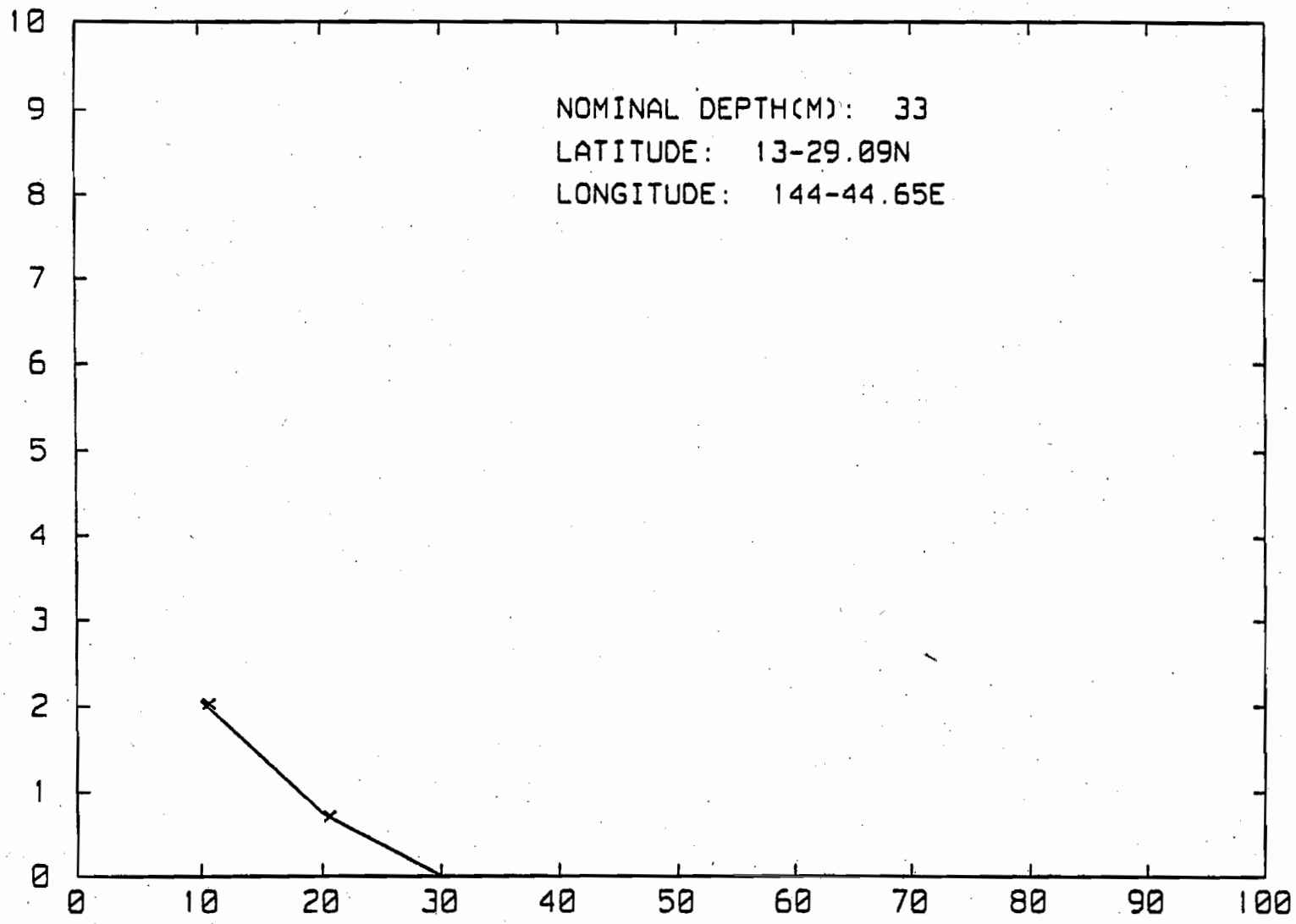



CUMULATIVE OCCURENCE OF CURRENT SPEEDS
(GST) 1545 NOV 7 1998 TO 1215 NOV 13 1998

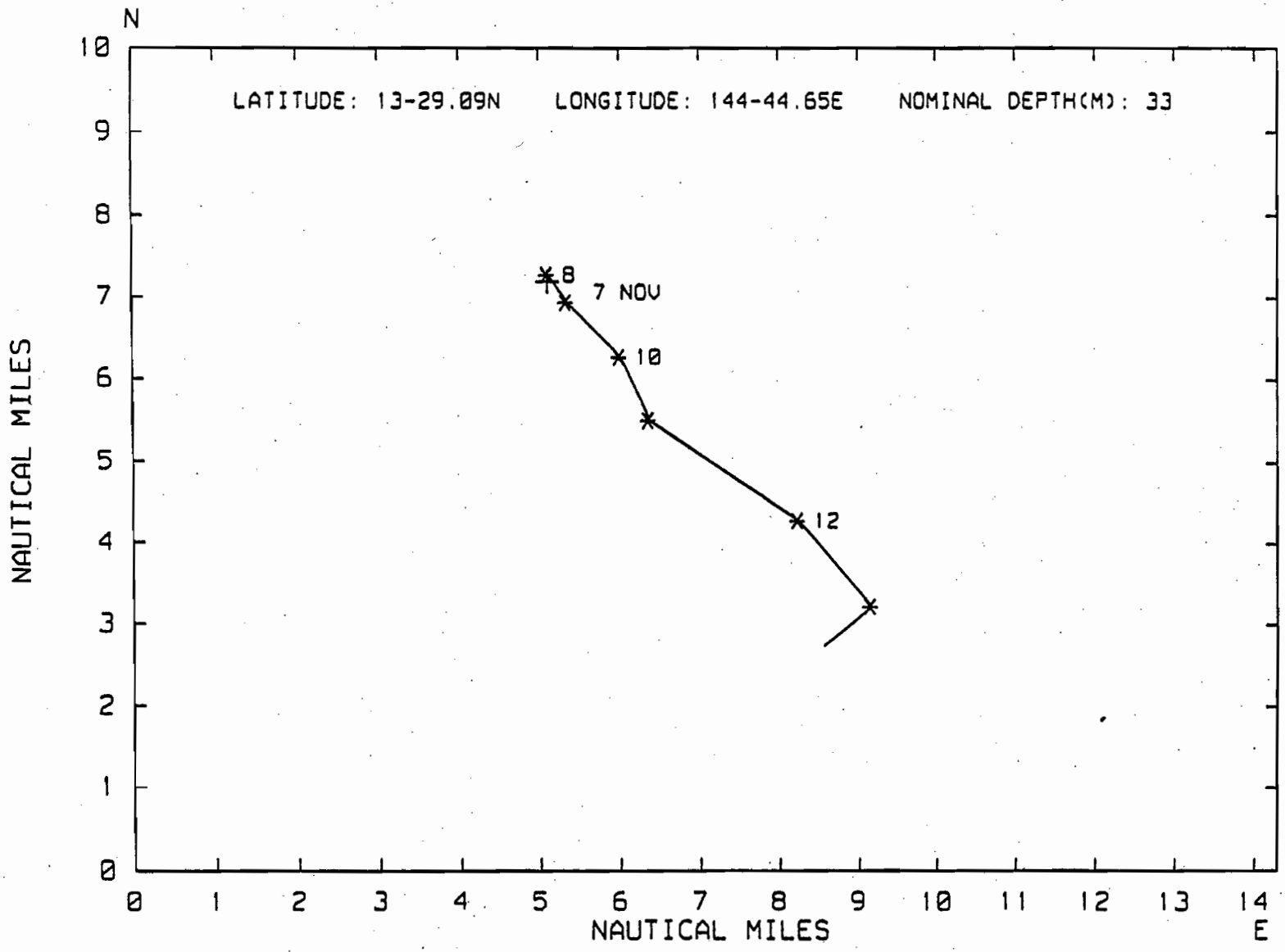
LATITUDE: 13-29.09N
LONGITUDE: 144-44.65E
NOMINAL DEPTH(METERS): 33
TIME SPAN(GST): 1545 NOV 7 1998 TO 1215 NOV 13 1998

PERSISTENCE OF CURRENT SPEEDS

| SPEED (CM/SEC) | MAXIMUM DURATION (HOURS) |
|---|---|
| 10 | 2.06 |
| 20 | .74 |
| 30 | 0.00 |




PERSISTENCE OF CURRENT SPEED FROM:
(GST) 1545 NOV 7 1998 TO 1215 NOV 13 1998




PROGRESSIVE VECTOR DIAGRAM OF CURRENTS
(GST) 1545 NOV 7 1998 TO 1215 NOV 13 1998

## TEMPERATURE STATISTICS

DEPLOYMENT 1  METER POSITION 1
FROM 1545  7 NOV 1998 TO 1215 13 NOV 1998

| TEMPERATURE(CENTIGRADE) | TOTAL OBSERVATIONS | PERCENT |
|---|---|---|
| 0 TO 1 | 0 | 0.00 |
| 1 TO 2 | 0 | 0.00 |
| 2 TO 3 | 0 | 0.00 |
| 3 TO 4 | 0 | 0.00 |
| 4 TO 5 | 0 | 0.00 |
| 5 TO 6 | 0 | 0.00 |
| 6 TO 7 | 0 | 0.00 |
| 7 TO 8 | 0 | 0.00 |
| 8 TO 9 | 0 | 0.00 |
| 9 TO 10 | 0 | 0.00 |
| 10 TO 11 | 0 | 0.00 |
| 11 TO 12 | 0 | 0.00 |
| 12 TO 13 | 0 | 0.00 |
| 13 TO 14 | 0 | 0.00 |
| 14 TO 15 | 0 | 0.00 |
| 15 TO 16 | 0 | 0.00 |
| 16 TO 17 | 0 | 0.00 |
| 17 TO 18 | 0 | 0.00 |
| 18 TO 19 | 0 | 0.00 |
| 19 TO 20 | 0 | 0.00 |
| 20 TO 21 | 0 | 0.00 |
| 21 TO 22 | 0 | 0.00 |
| 22 TO 23 | 0 | 0.00 |
| 23 TO 24 | 0 | 0.00 |
| 24 TO 25 | 0 | 0.00 |
| 25 TO 26 | 0 | 0.00 |
| 26 TO 27 | 0 | 0.00 |
| 27 TO 28 | 0 | 0.00 |
| 28 TO 29 | 0 | 0.00 |
| 29 TO 30 | 844 | 100.00 |

TOTAL NUMBER OF POINTS READ =  844
TOTAL NUMBER OF OBSERVATION USED IN THE DISTRIBUTION =  844
MEAN TEMPERATURE = 29.3 DEGREES CENTIGRADE
STANDARD DEVIATION =  0.0 DEGREES CENTIGRADE
MAXIMUM TEMPERATURE = 29.4 DEGREES CENTIGRADE
MINIMUM TEMPERATURE = 29.2 DEGREES CENTIGRADE
RANGE =  .2 DEGREES CENTIGRADE

Guam Agana WWTP Diffuser Monthly Current-Temperature Statistics

DEPLOYMENT LOCATION: 1

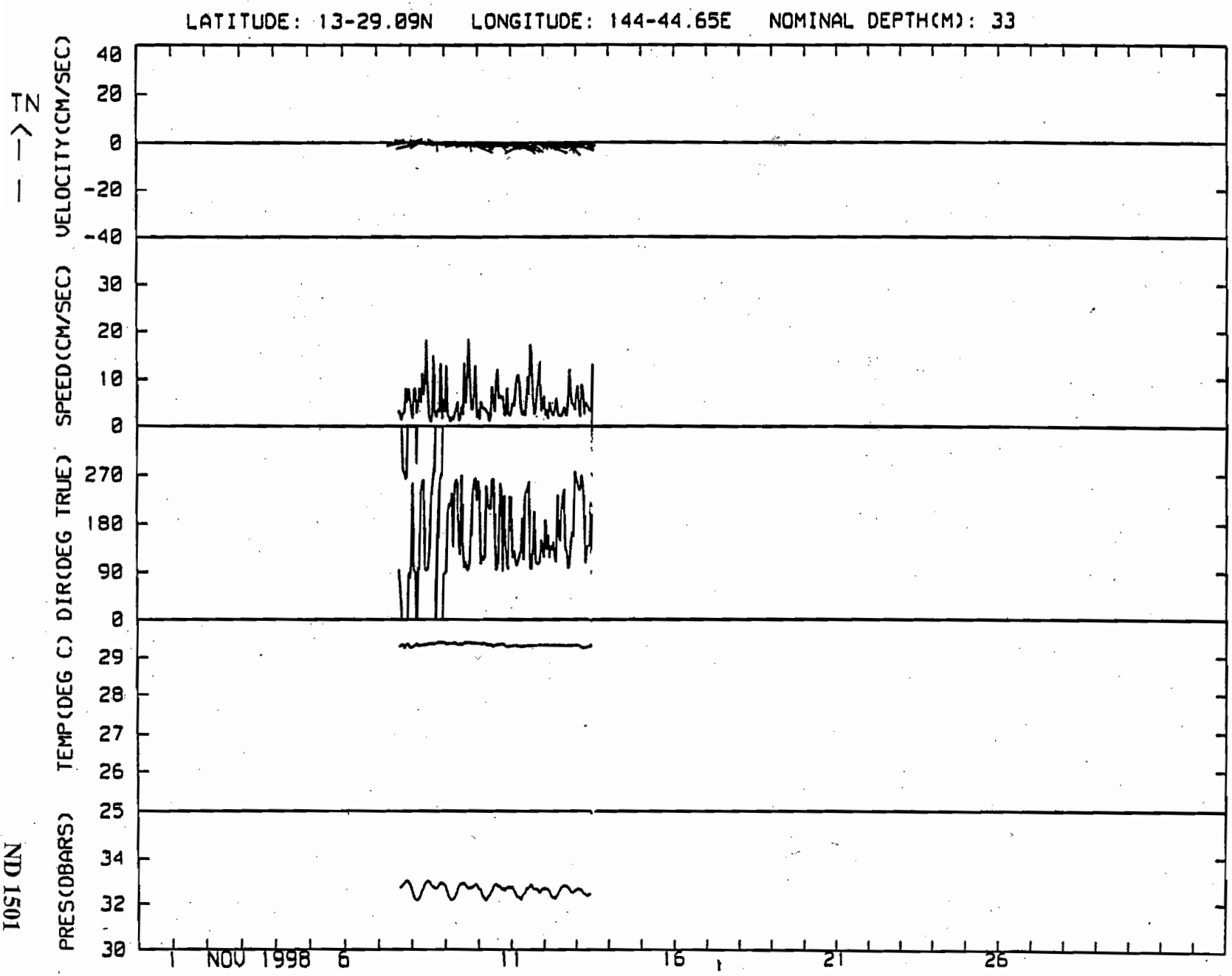
Latitude: 13-29.09N  Longitude: 144-44.65E
Meter Depth(m): 33.0  Bottom Depth(m): 61.0

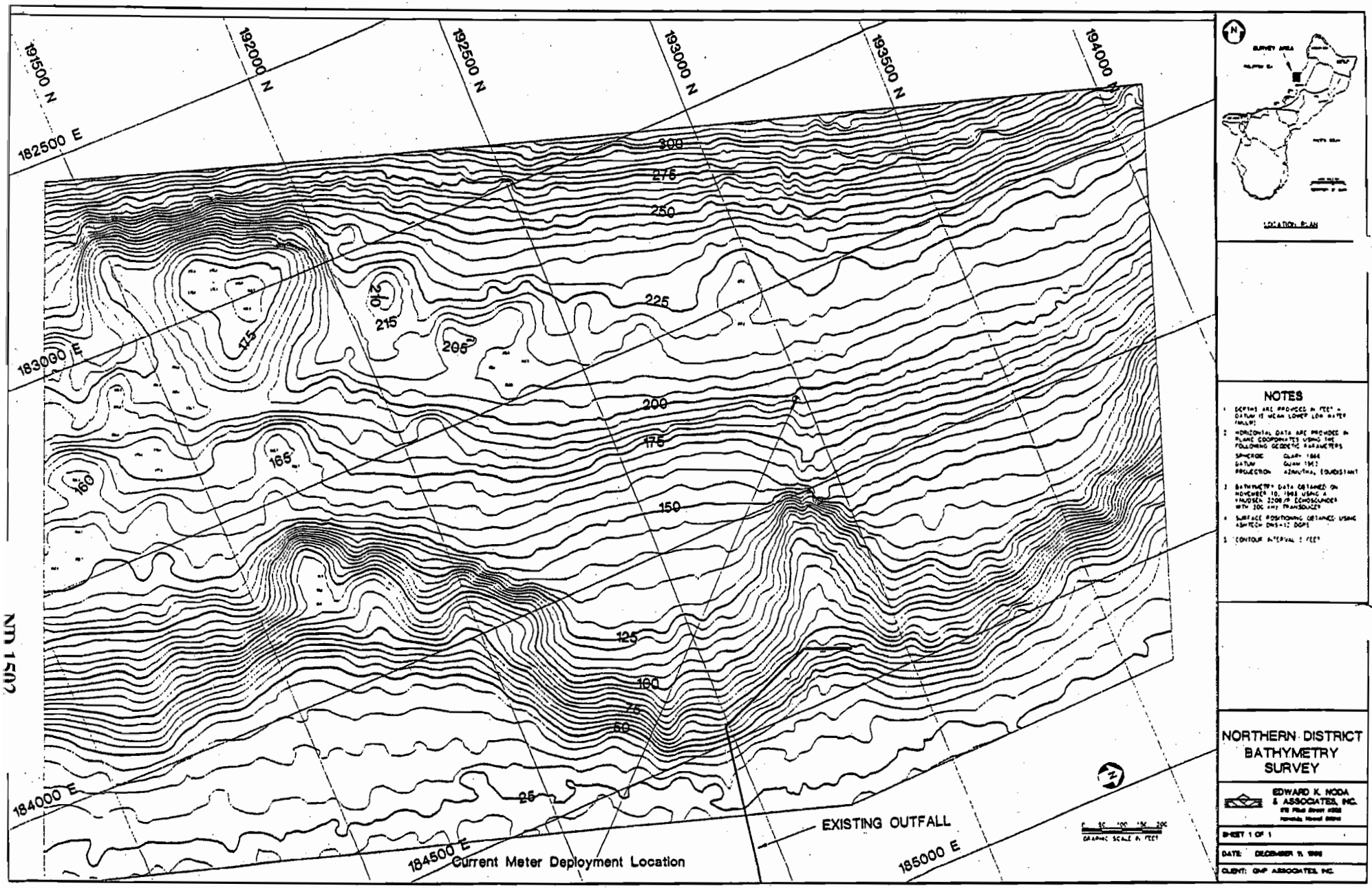
Period: NOVEMBER 1998

Mean Speed(cm/sec): 5.90
Maximum Speed(cm/sec): 24.20
Standard Deviation: 4.36
Average North Vector Component(cm/sec): -1.63
Average East Vector Component(cm/sec): 1.25
Resultant Magnitude(cm/sec): 2.05
Resultant Direction(°T): 143

Minimum Temperature(°C): 29.2
Maximum Temperature(°C): 29.4
Mean Temperature(°C): 29.3
Standard Deviation: 0.0

| Day | Maximum Speed | Minimum Temperature | Maximum Temperature |
|---|---|---|---|
| 7 | 17.00 | 29.2 | 29.4 |
| 8 | 24.20 | 29.2 | 29.4 |
| 9 | 20.20 | 29.2 | 29.4 |
| 10 | 17.00 | 29.3 | 29.4 |
| 11 | 22.80 | 29.3 | 29.3 |
| 12 | 14.90 | 29.3 | 29.3 |
| 13 | 14.10 | 29.2 | 29.3 |


LATITUDE: 13-29.09N LONGITUDE: 144-44.65E NOMINAL DEPTH(M): 33
VELOCITY(CM/SEC)
40
20
0
-20
-40
SPEED(CM/SEC)
30
20
10
0
DIR(DEG TRUE)
270
180
90
0
TEMP(DEG C)
29
28
27
26
25
PRES(DBARS)
34
32
30
1 NOV 1998
6
11
16
21
26
TN
ND 1501


191500 N
192000 N
192500 N
193000 N
193500 N
194000 N
182500 E
183000 E
184000 E
184500 E
185000 E
300
275
250
225
215
205
200
175
165
160
150
125
100
75
50
25
EXISTING OUTFALL
Current Meter Deployment Location
SURVEY AREA
LOCATION PLAN
NOTES
1 DEPTHS ARE PROVIDED IN FEET & DATUM IS MEAN LOWER LOW WATER (MLLW)
2 HORIZONTAL DATA ARE PROVIDED IN PLANE COORDINATES USING THE FOLLOWING GEODETIC PARAMETERS
SPHEROID CLARK 1866
DATUM OAHU 1967
PROJECTION AZIMUTHAL EQUIDISTANT
3 BATHYMETRY DATA OBTAINED ON NOVEMBER 10, 1988 USING A HYDROSEN 220B/P ECHOSOUNDER WITH 100 kHz TRANSDUCER
4 SURFACE POSITIONING OBTAINED USING ASHTECH DR5-12 DGPS
5 CONTOUR INTERVAL 5 FEET
GRAPHIC SCALE IN FEET
NORTHERN DISTRICT BATHYMETRY SURVEY
EDWARD K. NODA & ASSOCIATES, INC.
SHEET 1 OF 1
DATE: DECEMBER 9, 1988
CLIENT: GMP ASSOCIATES, INC.

GUAM NORTHERN DISTRICT WWTP DIFFUSER -- 1

CURRENT METER S/N -- 0831

METER POSITION ----- 2

DATA ACQUISITION
   DEPLOYMENT DATE(GST) - NOV. 7 ,1998
   DEPLOYMENT TIME(GST) - 1715

   RETRIEVAL DATE(GST) --- NOV. 13,1998
   RETRIEVAL TIME(GST) --- 0935

MOORING LOCATION
   LATITUDE -------- 13-33.13N
   LONGITUDE ------- 144-48.26E

SENSOR DEPTH(M) ---- 27

BOTTOM DEPTH(M) ---- 58

MAGNETIC DECLINATION(DEGREES) --  1.8

DATA ANALYSIS
   START DATE(GST) - NOV. 7 ,1998
   START TIME(GST) - 1715

   ENDING DATE(GST) - NOV. 13,1998
   ENDING TIME(GST) - 0935

TIME INTERVAL(MIN) -  10.00

DISTRIBUTION FREQUENCY

.17 HOUR AVERAGES
DEPLOYMENT 1 METER POSITION 2
FROM 1715 7 NOV 1998 TO 935 13 NOV 1998

| DIRECTION DEGREES TRUE | 27 METERS DEPTH | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0- 15 | 14 | 10 | 2 | 5 | 0 | 1 | 0 | 0 | 0 | 0 | |
| 15- 30 | 18 | 46 | 39 | 34 | 7 | 4 | 3 | 0 | 0 | 0 | |
| 30- 45 | 30 | 65 | 57 | 16 | 1 | 0 | 0 | 0 | 0 | 0 | |
| 45- 60 | 39 | 27 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 60- 75 | 27 | 9 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 75- 90 | 19 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 90-105 | 30 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 105-120 | 10 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 120-135 | 11 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 135-150 | 15 | 11 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 150-165 | 17 | 13 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 165-180 | 31 | 24 | 24 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 180-195 | 38 | 24 | 17 | 7 | 2 | 0 | 0 | 0 | 0 | 0 | |
| 195-210 | 10 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 210-225 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 225-240 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 240-255 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 255-270 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 270-285 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 285-300 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 300-315 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 315-330 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 330-345 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 345-360 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| SPEED | 0 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | |
| CM/SEC | \| | \| | \| | \| | \| | \| | \| | \| | \| | \| | |
| | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0- 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 15- 30 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 30- 45 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 45- 60 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 60- 75 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 75- 90 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 90-105 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 105-120 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 120-135 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 135-150 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 150-165 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 165-180 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 180-195 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 195-210 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 210-225 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 225-240 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 240-255 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 255-270 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 270-285 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 285-300 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 300-315 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 315-330 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 330-345 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 345-360 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SPEED | 50 | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | |
| CM/SEC | \| | \| | \| | \| | \| | \| | \| | \| | \| | \| | >100 |
| | 55 | 60 | 65 | 70 | 75 | 80 | 85 | 90 | 95 | 100 | |

SUMMARY STATISTICS

DEPLOYMENT 1 METER POSITION 2

FROM 1715 7 NOV 1998 TO 935 13 NOV 1998

| DIRECTION(DEGREES TRUE) | TOTAL OBSERVATIONS | PERCENT |
|---|---|---|
| 0 TO 15 | 32 | 3.91 |
| 15 TO 30 | 151 | 18.44 |
| 30 TO 45 | 169 | 20.63 |
| 45 TO 60 | 72 | 8.79 |
| 60 TO 75 | 37 | 4.52 |
| 75 TO 90 | 21 | 2.56 |
| 90 TO 105 | 35 | 4.27 |
| 105 TO 120 | 18 | 2.20 |
| 120 TO 135 | 15 | 1.83 |
| 135 TO 150 | 27 | 3.30 |
| 150 TO 165 | 34 | 4.15 |
| 165 TO 180 | 80 | 9.77 |
| 180 TO 195 | 88 | 10.74 |
| 195 TO 210 | 15 | 1.83 |
| 210 TO 225 | 6 | .73 |
| 225 TO 240 | 3 | .37 |
| 240 TO 255 | 2 | .24 |
| 255 TO 270 | 1 | .12 |
| 270 TO 285 | 4 | .49 |
| 285 TO 300 | 1 | .12 |
| 300 TO 315 | 0 | 0.00 |
| 315 TO 330 | 1 | .12 |
| 330 TO 345 | 1 | .12 |
| 345 TO 360 | 6 | .73 |

| SPEED(CM/SEC) | TOTAL OBSERVATIONS | PERCENT |
|---|---|---|
| 0.0 TO 5.0 | 328 | 40.05 |
| 5.0 TO 10.0 | 258 | 31.50 |
| 10.0 TO 15.0 | 152 | 18.56 |
| 15.0 TO 20.0 | 63 | 7.69 |
| 20.0 TO 25.0 | 10 | 1.22 |
| 25.0 TO 30.0 | 5 | .61 |
| 30.0 TO 35.0 | 3 | .37 |
| 35.0 TO 40.0 | 0 | 0.00 |
| 40.0 TO 45.0 | 0 | 0.00 |
| 45.0 TO 50.0 | 0 | 0.00 |
| 50.0 TO 55.0 | 0 | 0.00 |
| 55.0 TO 60.0 | 0 | 0.00 |
| 60.0 TO 65.0 | 0 | 0.00 |
| 65.0 TO 70.0 | 0 | 0.00 |
| 70.0 TO 75.0 | 0 | 0.00 |
| 75.0 TO 80.0 | 0 | 0.00 |
| 80.0 TO 85.0 | 0 | 0.00 |
| 85.0 TO 90.0 | 0 | 0.00 |
| 90.0 TO 95.0 | 0 | 0.00 |
| 95.0 TO 100.0 | 0 | 0.00 |
| ABOVE 100 | 0 | 0.00 |

TOTAL NUMBER OF POINTS READ = 819

TOTAL NUMBER OF OBSERVATIONS USED IN THE DISTRIBUTIONS = 819

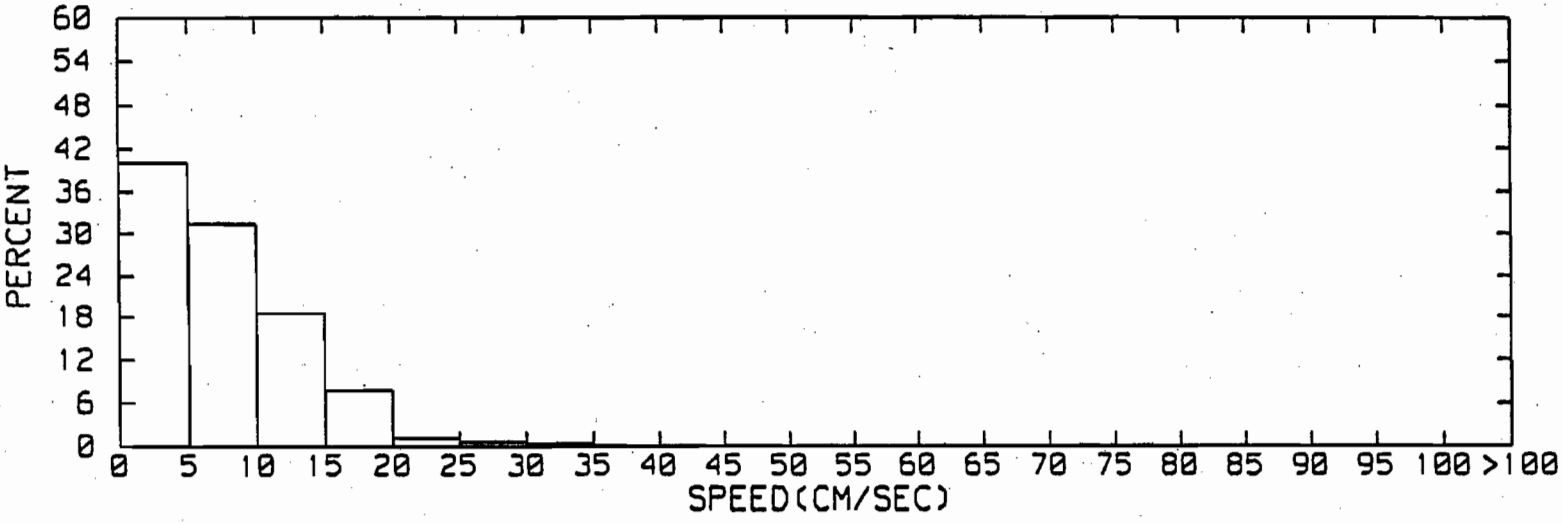
MEAN SPEED = 7.50 CM/SEC

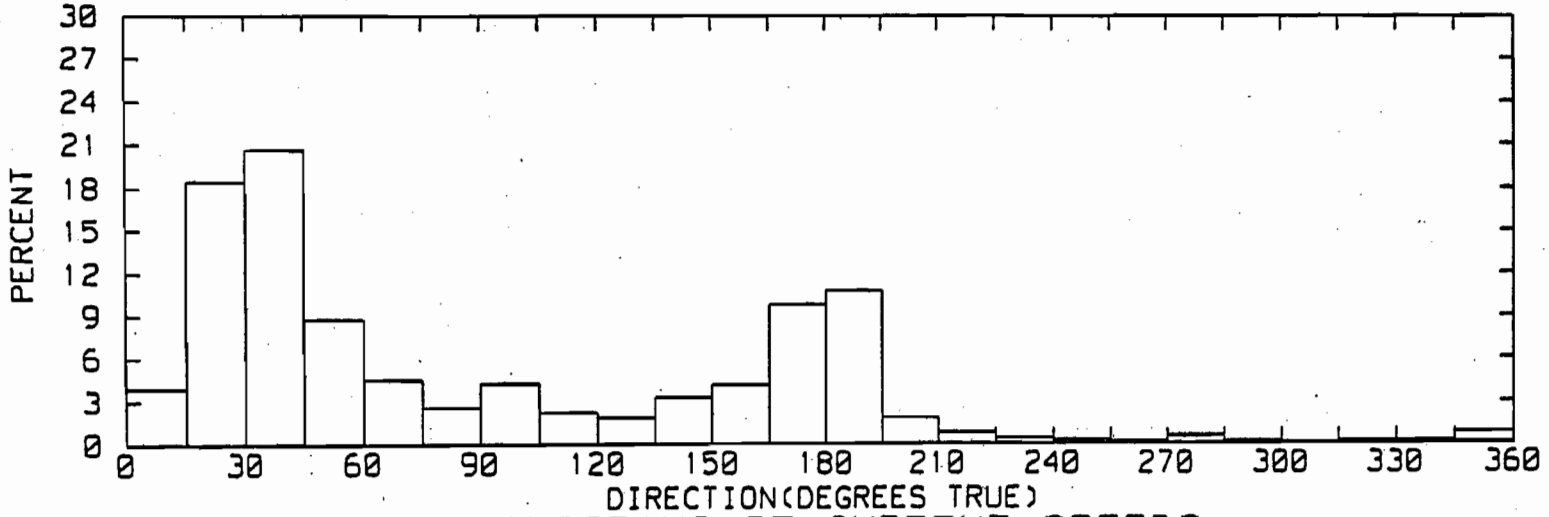
STANDARD DEVIATION = 5.38 CM/SEC

MAXIMUM SPEED = 32.90 CM/SEC

MINIMUM SPEED = 0.00 CM/SEC

RANGE = 32.90 CM/SEC

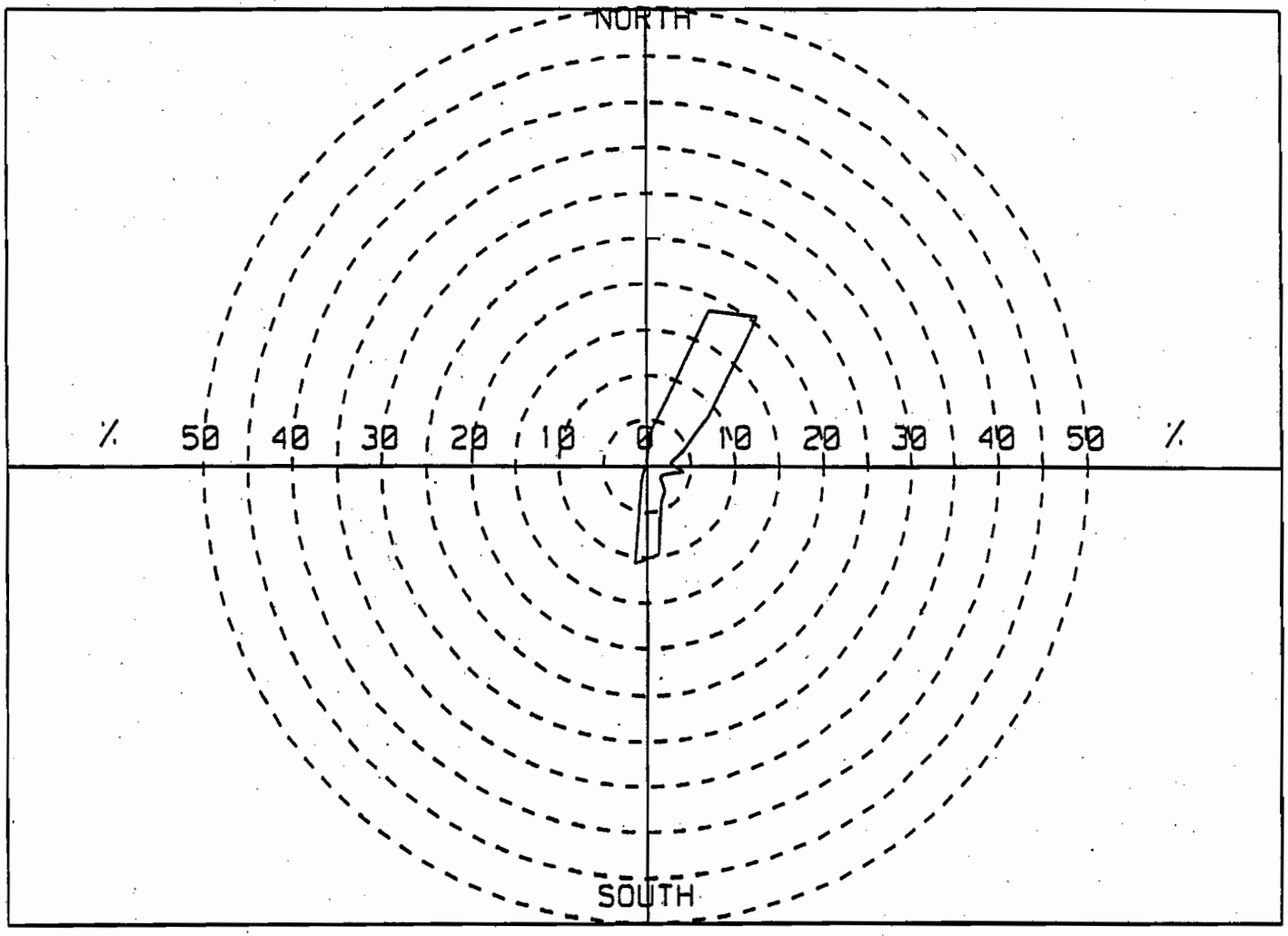



# HISTOGRAMS OF CURRENT SPEEDS

(GST) 1715 NOV 7 1998 TO 0935 NOV 13 1998

LATITUDE: 13-33.13N LONGITUDE: 144-48.26E NOMINAL DEPTH(M): 27




PERCENT OCCURRENCE VS DIRECTION(DEG TRUE)

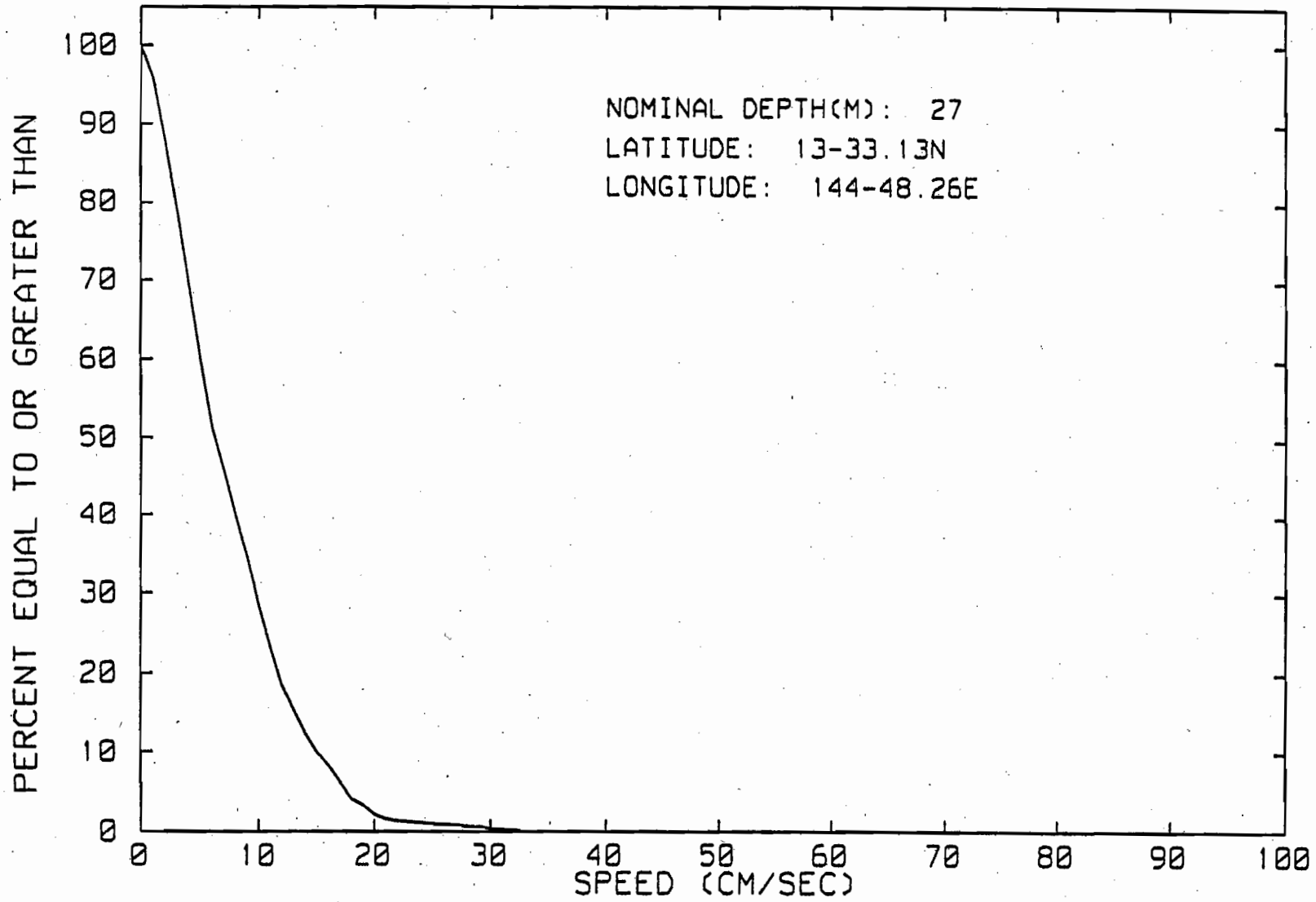
(GST) 1715 NOV 7 1998 TO 0935 NOV 13 1998

LATITUDE: 13-33.13N LONGITUDE: 144-48.26E NOMINAL DEPTH(M): 27

LATITUDE: 13-33.13N
LONGITUDE: 144-48.26E
NOMINAL DEPTH(METERS): 27
TIME SPAN(GST): 1715 NOV 7 1998 TO 0935 NOV 13 1998

CUMULATIVE OCCURENCE OF CURRENT SPEEDS

| SPEED (CM/SEC) | PERCENT EQUAL TO OR GREATER THAN |
|---|---|
| 0 | 100.000 |
| 3 | 78.999 |
| 6 | 51.282 |
| 9 | 34.554 |
| 12 | 18.437 |
| 15 | 9.890 |
| 18 | 4.151 |
| 21 | 1.587 |
| 24 | 1.099 |
| 27 | .855 |
| 30 | .366 |
| 33 | 0.000 |

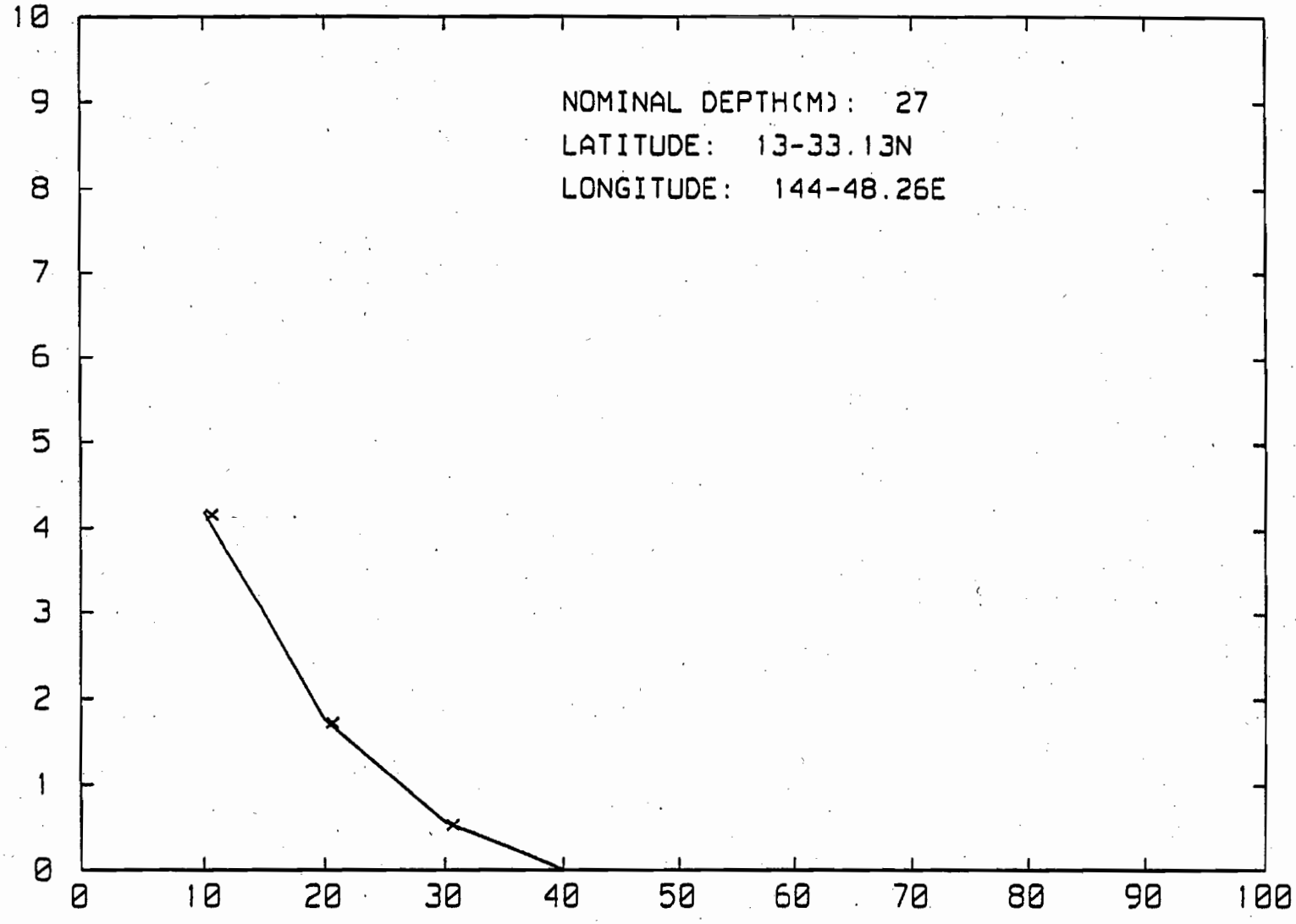



CUMULATIVE OCCURENCE OF CURRENT SPEEDS
(GST) 1715 NOV 7 1998 TO 0935 NOV 13 1998

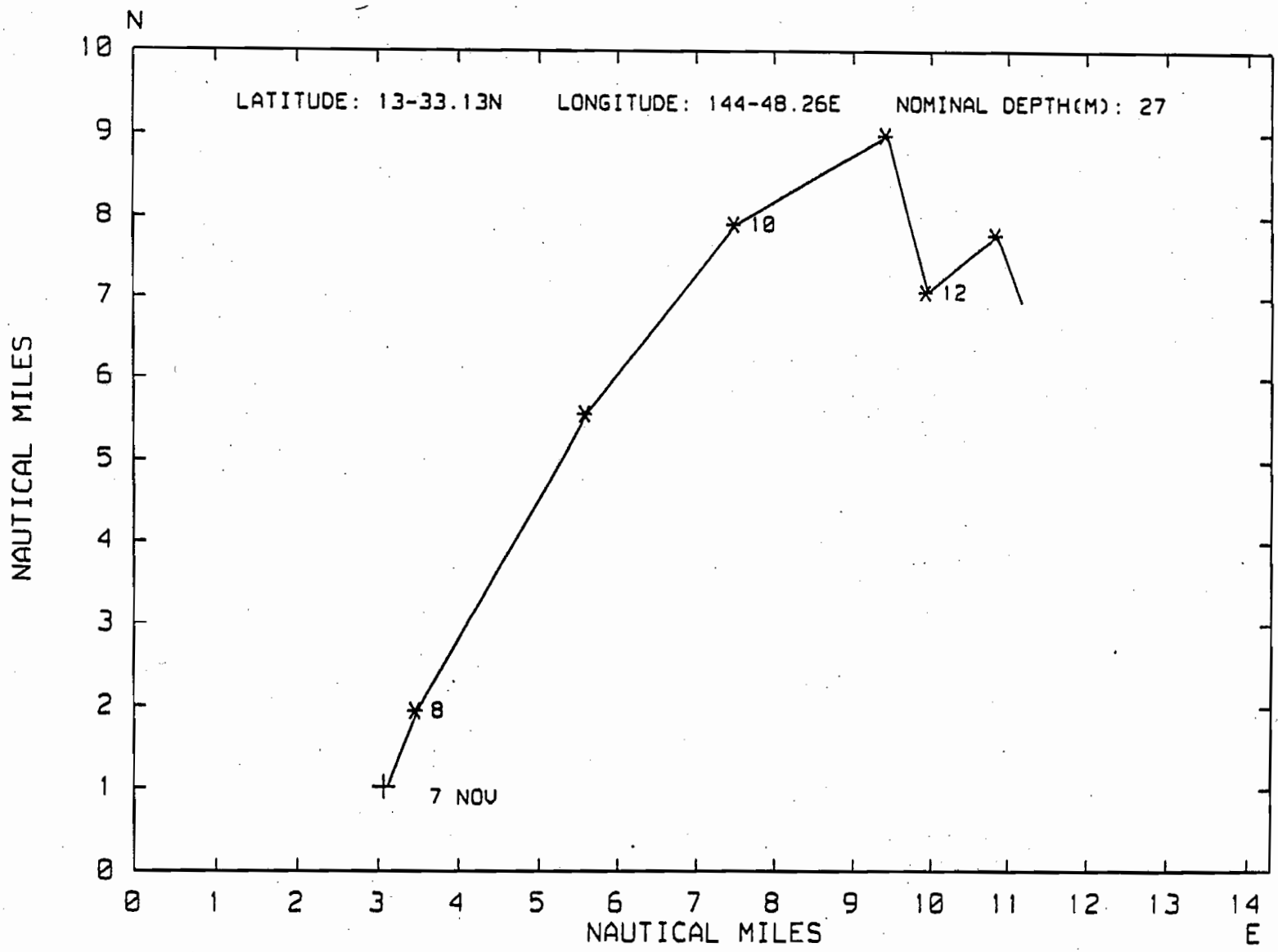
LATITUDE: 13-33.13N
LONGITUDE: 144-48.26E
NOMINAL DEPTH(METERS): 27
TIME SPAN(GST): 1715 NOV 7 1998 TO 0935 NOV 13 1998

PERSISTENCE OF CURRENT SPEEDS

| SPEED (CM/SEC) | MAXIMUM DURATION (HOURS) |
|---|---|
| 10 | 4.19 |
| 20 | 1.75 |
| 30 | .57 |
| 40 | 0.00 |




PERSISTENCE OF CURRENT SPEED FROM:
(GST) 1715 NOV 7 1998 TO 0935 NOV 13 1998




PROGRESSIVE VECTOR DIAGRAM OF CURRENTS
(GST) 1715 NOV 7 1998 TO 0935 NOV 13 1998

ND 1512

## TEMPERATURE STATISTICS

DEPLOYMENT 1  METER POSITION 2
FROM 1715  7 NOV 1998 TO  935 13 NOV 1998

| TEMPERATURE(CENTIGRADE) | TOTAL OBSERVATIONS | PERCENT |
|---|---|---|
| 0 TO 1 | 0 | 0.00 |
| 1 TO 2 | 0 | 0.00 |
| 2 TO 3 | 0 | 0.00 |
| 3 TO 4 | 0 | 0.00 |
| 4 TO 5 | 0 | 0.00 |
| 5 TO 6 | 0 | 0.00 |
| 6 TO 7 | 0 | 0.00 |
| 7 TO 8 | 0 | 0.00 |
| 8 TO 9 | 0 | 0.00 |
| 9 TO 10 | 0 | 0.00 |
| 10 TO 11 | 0 | 0.00 |
| 11 TO 12 | 0 | 0.00 |
| 12 TO 13 | 0 | 0.00 |
| 13 TO 14 | 0 | 0.00 |
| 14 TO 15 | 0 | 0.00 |
| 15 TO 16 | 0 | 0.00 |
| 16 TO 17 | 0 | 0.00 |
| 17 TO 18 | 0 | 0.00 |
| 18 TO 19 | 0 | 0.00 |
| 19 TO 20 | 0 | 0.00 |
| 20 TO 21 | 0 | 0.00 |
| 21 TO 22 | 0 | 0.00 |
| 22 TO 23 | 0 | 0.00 |
| 23 TO 24 | 0 | 0.00 |
| 24 TO 25 | 0 | 0.00 |
| 25 TO 26 | 0 | 0.00 |
| 26 TO 27 | 0 | 0.00 |
| 27 TO 28 | 0 | 0.00 |
| 28 TO 29 | 0 | 0.00 |
| 29 TO 30 | 819 | 100.00 |

TOTAL NUMBER OF POINTS READ =  819
TOTAL NUMBER OF OBSERVATION USED IN THE DISTRIBUTION =  819
MEAN TEMPERATURE = 29.2 DEGREES CENTIGRADE
STANDARD DEVIATION =  0.0 DEGREES CENTIGRADE
MAXIMUM TEMPERATURE = 29.2 DEGREES CENTIGRADE
MINIMUM TEMPERATURE = 29.0 DEGREES CENTIGRADE
RANGE =  .2 DEGREES CENTIGRADE

Guam Northern District WWTP Diffuser Monthly Current-Temperature Statistics

DEPLOYMENT LOCATION: 2

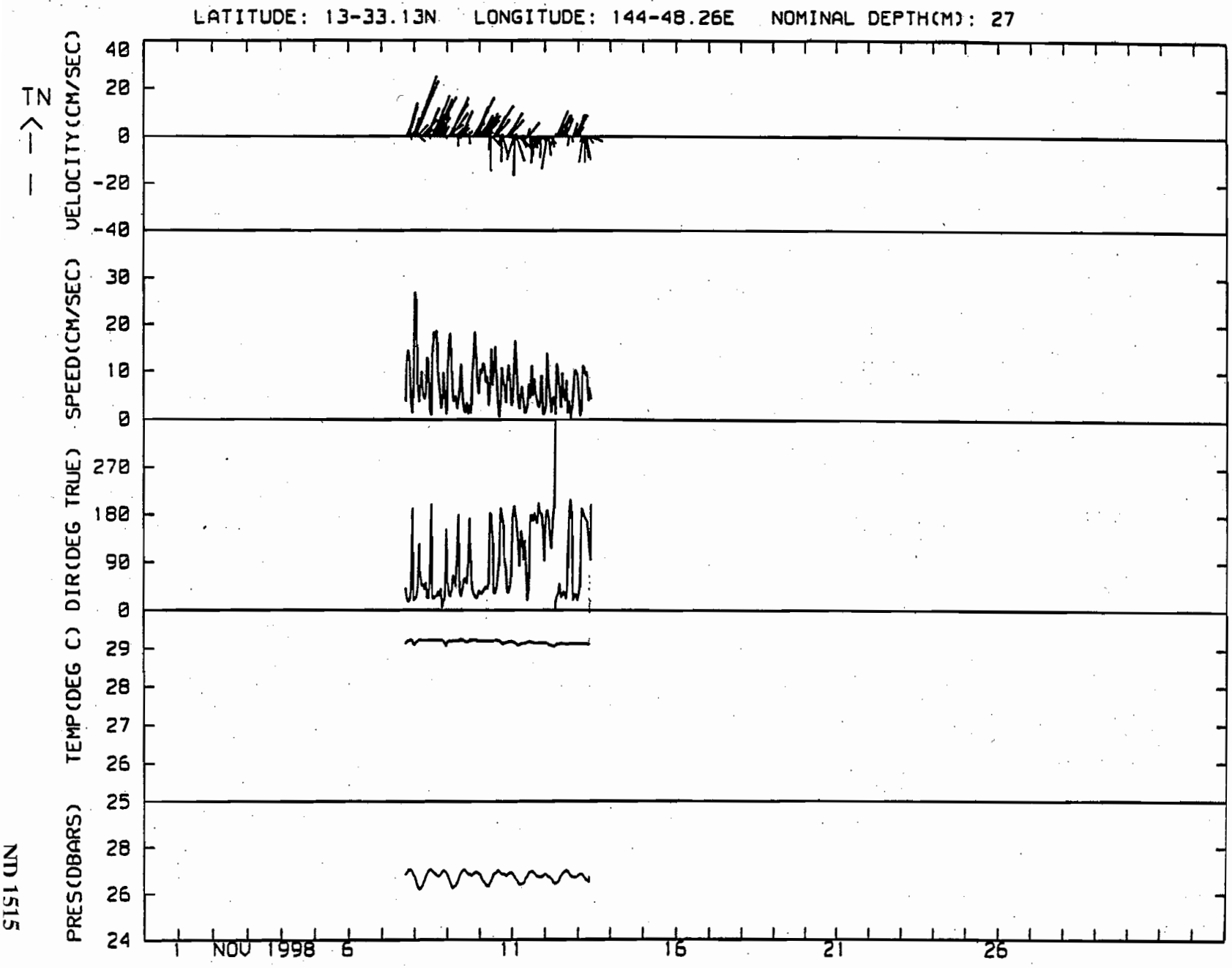
Latitude: 13-33.13N  Longitude: 144-48.26E
Meter Depth(m):  27.0  Bottom Depth(m):  58.0

Period: NOVEMBER 1998

Mean Speed(cm/sec):  7.50
Maximum Speed(cm/sec):  32.90
Standard Deviation:  5.38
Average North Vector Component(cm/sec):  2.24
Average East Vector Component(cm/sec):  3.04
Resultant Magnitude(cm/sec):  3.77
Resultant Direction(°T):  54

Minimum Temperature(°C): 29.0
Maximum Temperature(°C): 29.2
Mean Temperature(°C): 29.2
Standard Deviation:  0.0

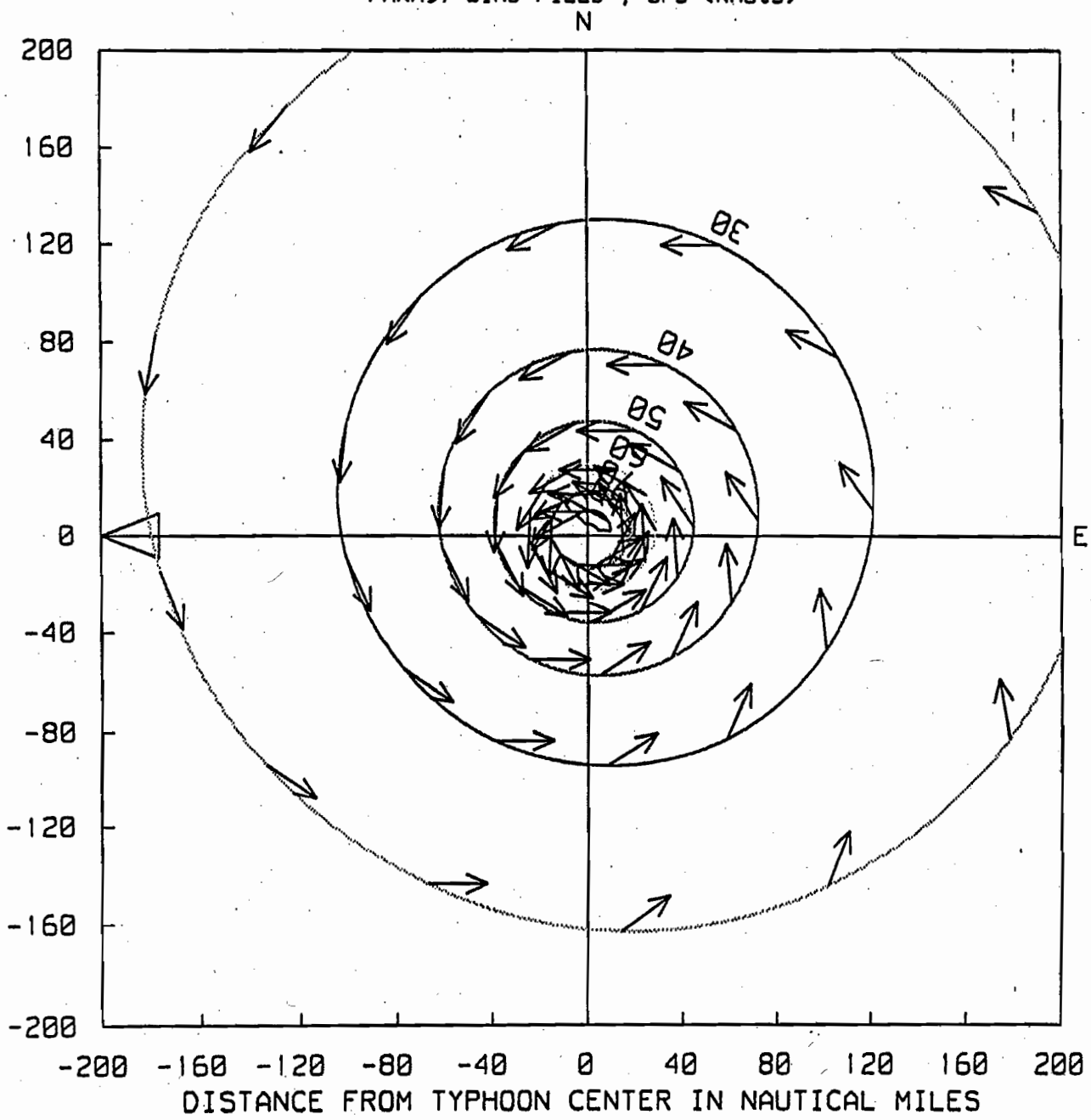
| Day | Maximum Speed | Minimum Temperature | Maximum Temperature |
|---|---|---|---|
| 7 | 16.90 | 29.0 | 29.2 |
| 8 | 32.90 | 29.0 | 29.2 |
| 9 | 22.40 | 29.1 | 29.2 |
| 10 | 17.80 | 29.1 | 29.2 |
| 11 | 21.10 | 29.1 | 29.2 |
| 12 | 19.00 | 29.1 | 29.2 |
| 13 | 15.50 | 29.1 | 29.1 |

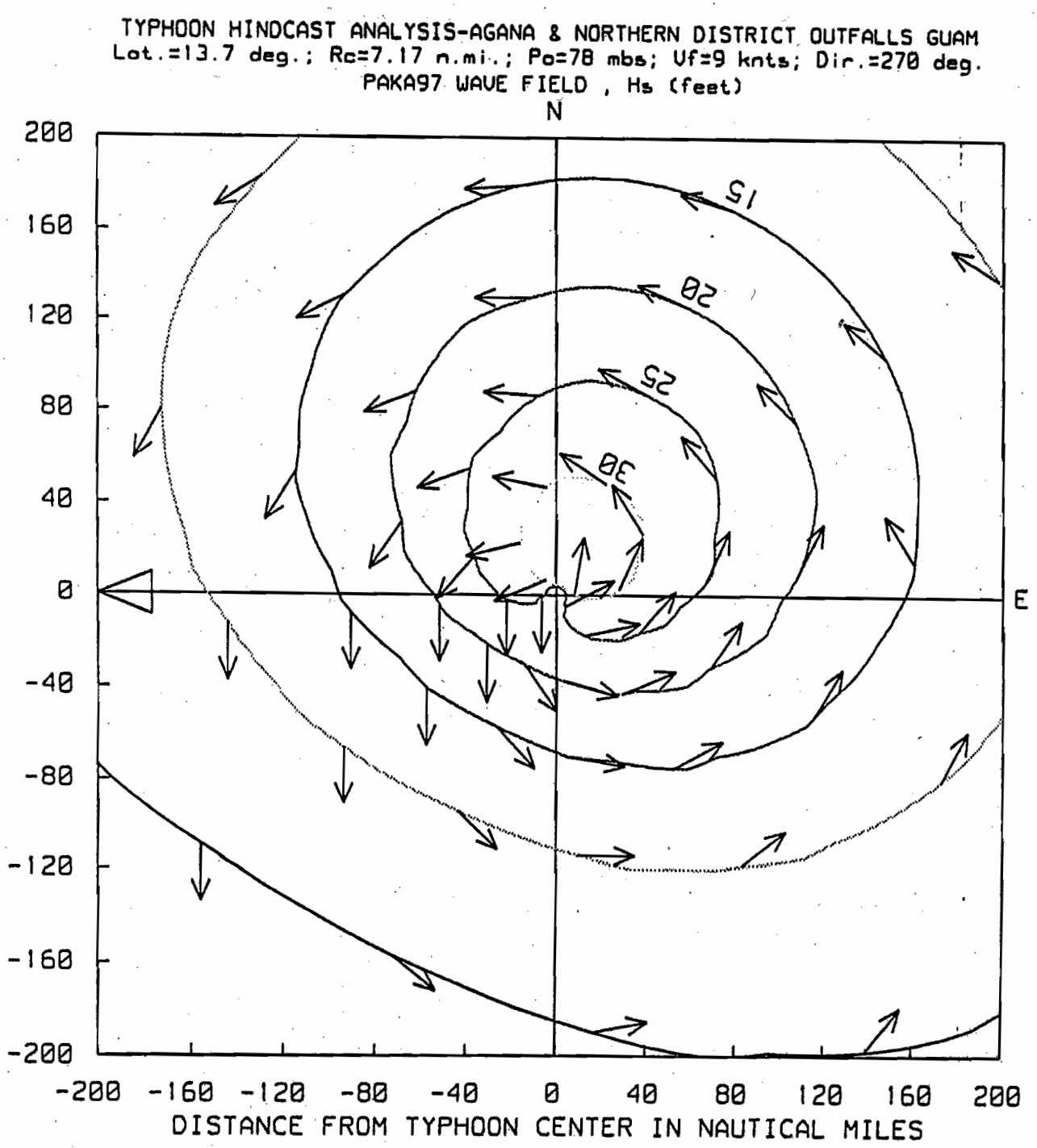

LATITUDE: 13-33.13N LONGITUDE: 144-48.26E NOMINAL DEPTH(M): 27
TN
VELOCITY(CM/SEC)
40
20
0
-20
-40
SPEED(CM/SEC)
30
20
10
0
DIR(DEG TRUE)
270
180
90
0
TEMP(DEG C)
29
28
27
26
25
PRES(DBARS)
28
26
24
1 NOV 1998
6
11
16
21
26

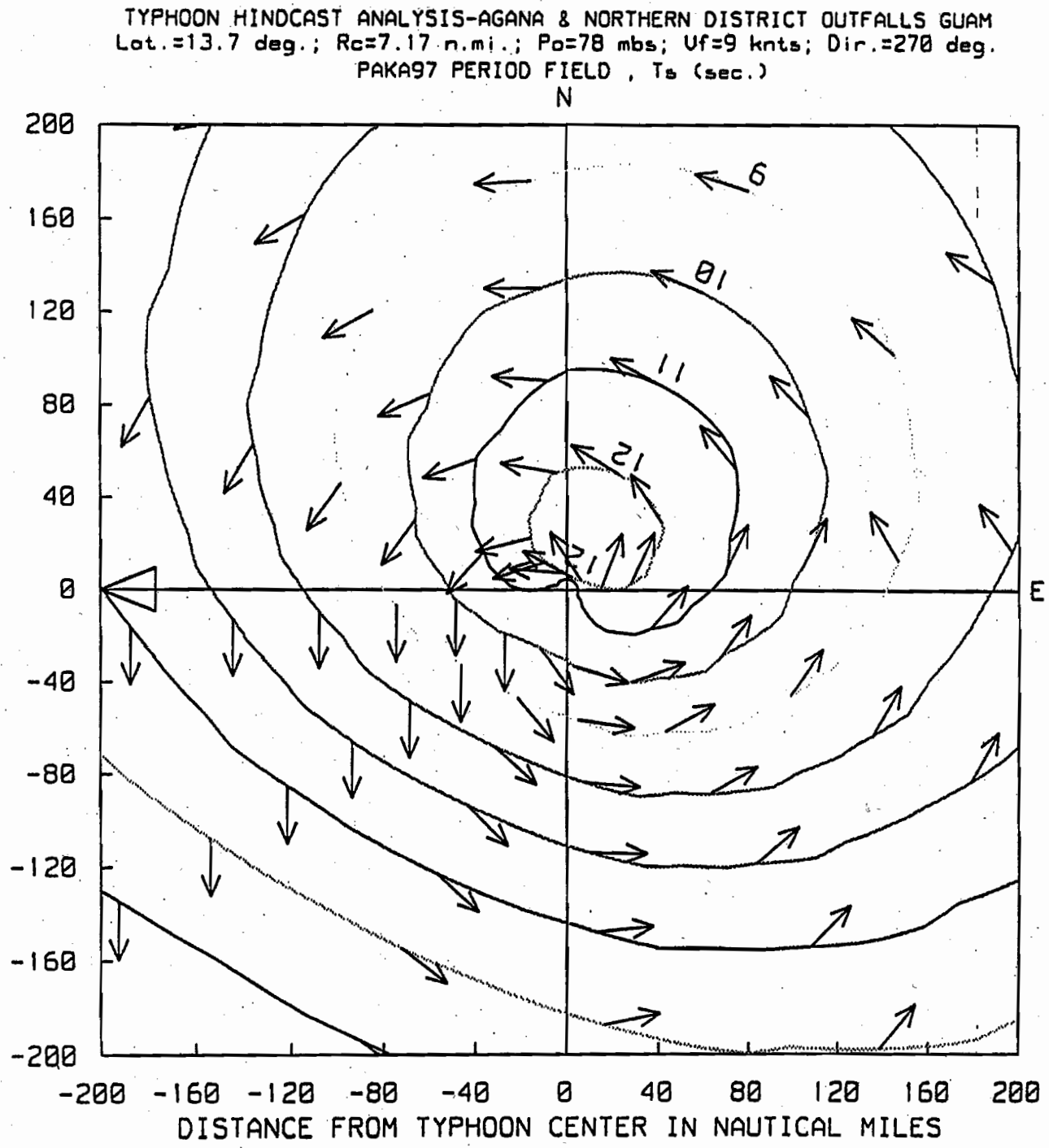
ND 1515

# APPENDIX D:

# WIND AND WAVE ANALYSIS

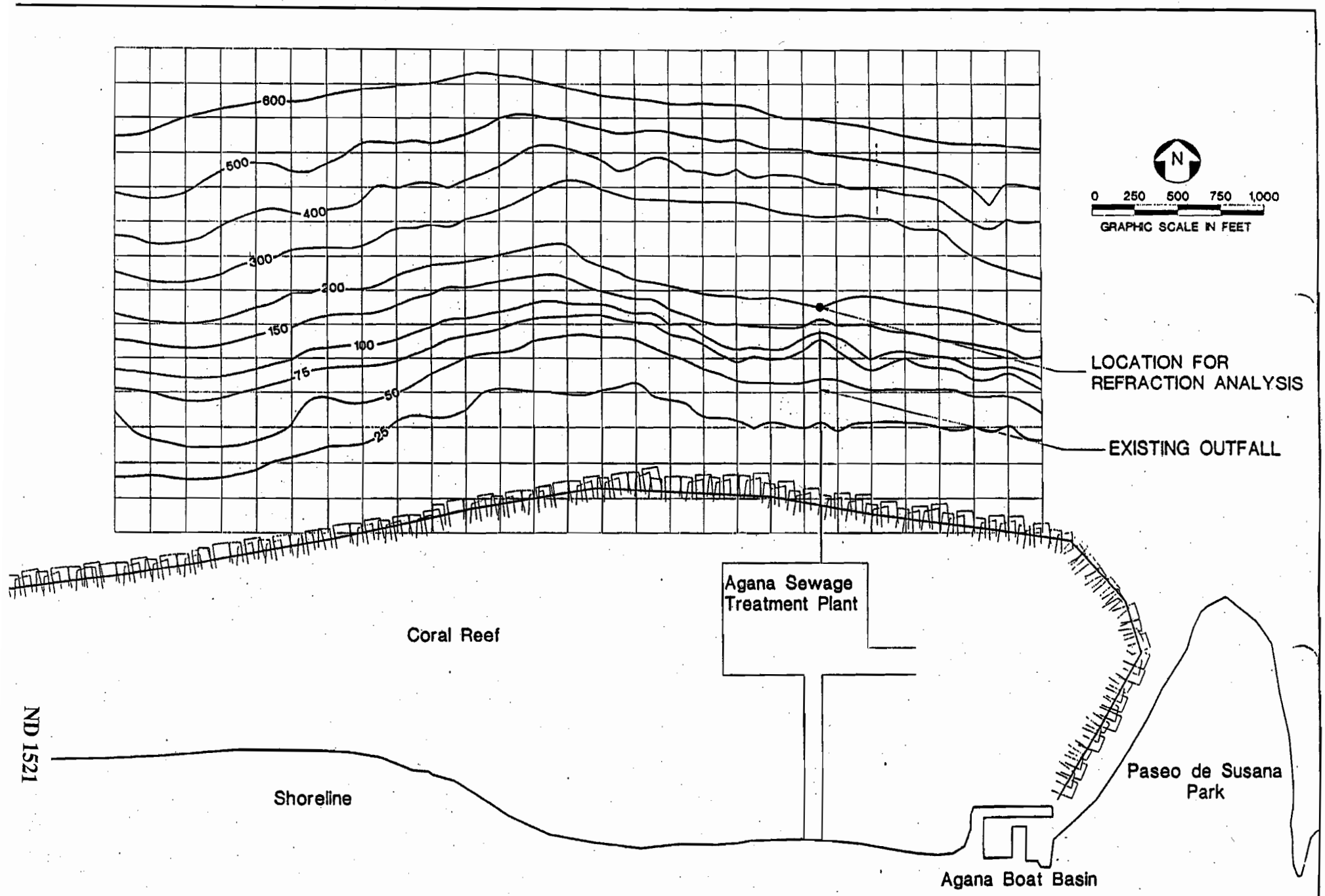

TYPHOON HINDCAST ANALYSIS-AGANA & NORTHERN DISTRICT OUTFALLS GUAM
Lat.=13.7 deg.; Rc=7.17 n.mi.; Po=78 mbs; Vf=9 knts; Dir.=270 deg.
PAKA97 WIND FIELD , Urs (knots)
N
E
30
40
50
60
200
160
120
80
40
0
-40
-80
-120
-160
-200
-200 -160 -120 -80 -40 0 40 80 120 160 200
DISTANCE FROM TYPHOON CENTER IN NAUTICAL MILES


TYPHOON HINDCAST ANALYSIS-AGANA & NORTHERN DISTRICT OUTFALLS GUAM
Lat.=13.7 deg.; Rc=7.17 n.mi.; Po=78 mbs; Vf=9 knts; Dir.=270 deg.
PAKA97 WAVE FIELD , Hs (feet)
N
E
15
20
25
30
200
160
120
80
40
0
-40
-80
-120
-160
-200
-200 -160 -120 -80 -40 0 40 80 120 160 200
DISTANCE FROM TYPHOON CENTER IN NAUTICAL MILES


TYPHOON HINDCAST ANALYSIS-AGANA & NORTHERN DISTRICT OUTFALLS GUAM
Lat.=13.7 deg.; Rc=7.17 n.mi.; Po=78 mbs; Vf=9 knts; Dir.=270 deg.
PAKA97 PERIOD FIELD , Ts (sec.)
N
E
6
8
11
12
14
200
160
120
80
40
0
-40
-80
-120
-160
-200
-200 -160 -120 -80 -40 0 40 80 120 160 200
DISTANCE FROM TYPHOON CENTER IN NAUTICAL MILES

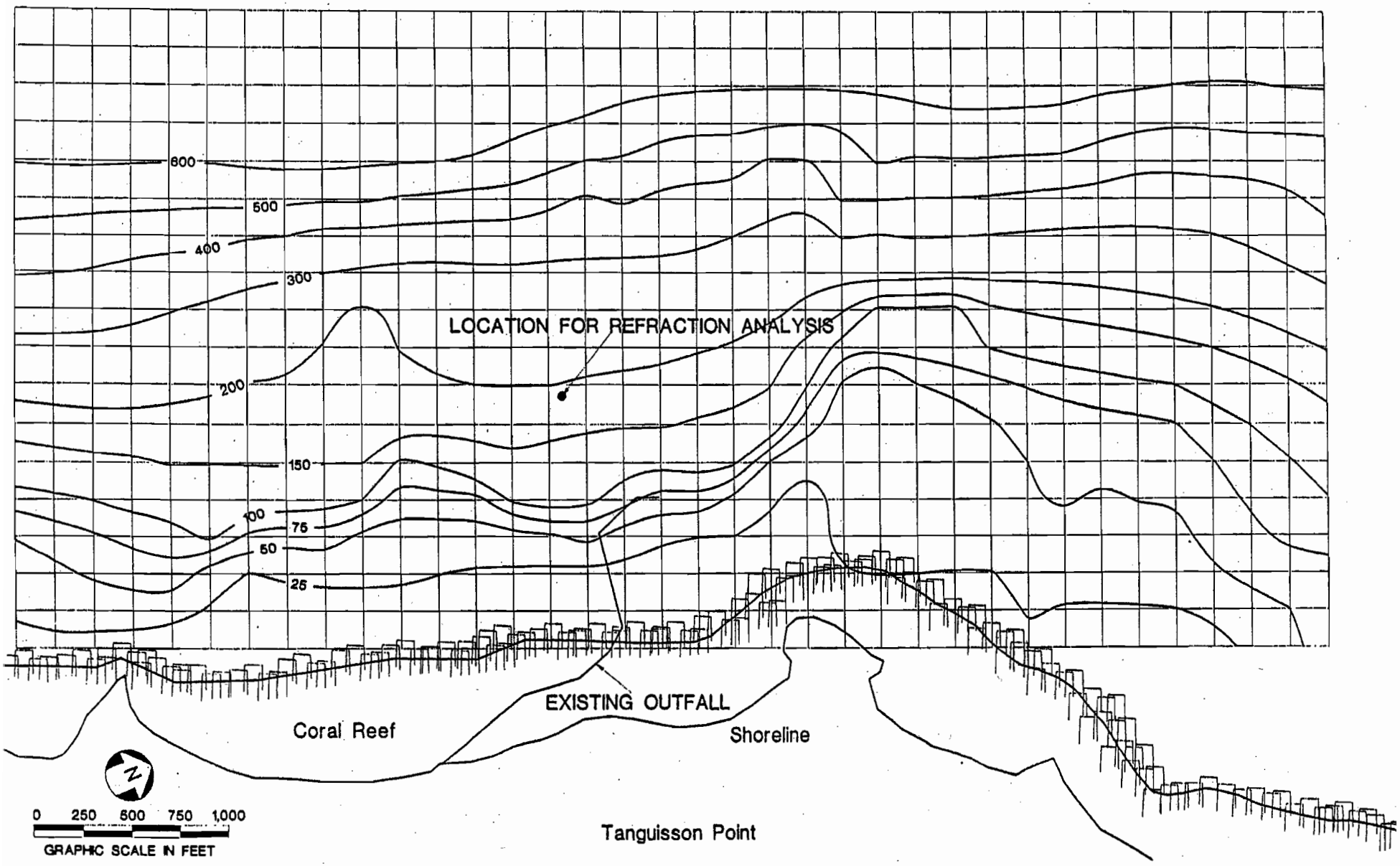
TYPHOON PAKA97
DATE: 01/08/99
Lat.= 13.7deg.; Rc= 7.17n.mi.; Po= 78mbs; Vf= 9knts; Dir.= 270deg.

| r | A0 | Urs | Bu | Hs | Bh | Ts | Tf0 | Tm |
|---|---|---|---|---|---|---|---|---|
| N.M. | DEG | KNOTS | DEG | FEET | DEG | SEC. | SEC. | SEC. |
| 5.0 | 25 | 80.7 | 90.0 | 31.0 | 115.9 | 11.9 | 10.9 | 8.2 |
| 10.0 | 25 | 81.3 | 90.0 | 33.0 | 125.8 | 12.3 | 11.3 | 8.4 |
| 15.0 | 25 | 75.1 | 90.0 | 33.3 | 127.0 | 12.5 | 12.0 | 8.6 |
| 20.0 | 25 | 69.3 | 90.0 | 33.5 | 131.3 | 12.6 | 12.6 | 8.8 |
| 25.0 | 25 | 64.4 | 90.0 | 33.3 | 131.8 | 12.6 | 13.1 | 8.9 |
| 30.0 | 25 | 60.4 | 90.0 | 32.7 | 128.5 | 12.6 | 13.5 | 8.9 |
| 35.0 | 25 | 57.0 | 90.0 | 32.4 | 128.8 | 12.5 | 13.8 | 9.0 |
| 40.0 | 25 | 54.0 | 90.0 | 31.4 | 125.2 | 12.4 | 13.9 | 8.9 |
| 45.0 | 25 | 51.4 | 90.0 | 31.0 | 125.3 | 12.3 | 14.2 | 9.0 |
| 50.0 | 25 | 49.2 | 90.0 | 30.6 | 125.4 | 12.2 | 14.5 | 9.0 |
| 55.0 | 25 | 47.2 | 90.0 | 29.5 | 121.7 | 12.0 | 14.4 | 8.9 |
| 60.0 | 25 | 45.3 | 90.0 | 29.1 | 121.7 | 11.9 | 14.6 | 8.9 |
| 65.0 | 25 | 43.7 | 90.0 | 28.7 | 121.8 | 11.8 | 14.8 | 8.9 |
| 70.0 | 25 | 42.2 | 90.0 | 28.2 | 121.8 | 11.7 | 15.0 | 9.0 |
| 75.0 | 25 | 40.8 | 90.0 | 27.0 | 118.0 | 11.5 | 14.8 | 8.8 |
| 80.0 | 25 | 39.5 | 90.0 | 26.6 | 118.0 | 11.4 | 14.9 | 8.8 |
| 85.0 | 25 | 38.3 | 90.0 | 26.1 | 118.0 | 11.3 | 15.1 | 8.8 |
| 90.0 | 25 | 37.2 | 90.0 | 25.7 | 118.0 | 11.2 | 15.2 | 8.9 |
| 95.0 | 25 | 36.2 | 90.0 | 25.3 | 118.0 | 11.1 | 15.3 | 8.9 |
| 100.0 | 25 | 35.2 | 90.0 | 24.1 | 117.2 | 10.9 | 15.0 | 8.7 |
| 105.0 | 25 | 34.3 | 90.0 | 23.7 | 117.2 | 10.8 | 15.1 | 8.7 |
| 110.0 | 25 | 33.4 | 90.0 | 23.2 | 117.1 | 10.7 | 15.2 | 8.7 |
| 115.0 | 25 | 32.5 | 90.0 | 22.7 | 114.2 | 10.6 | 15.2 | 8.7 |
| 120.0 | 25 | 31.8 | 90.0 | 22.2 | 114.2 | 10.5 | 15.3 | 8.8 |
| 125.0 | 25 | 31.0 | 90.0 | 21.8 | 114.2 | 10.4 | 15.4 | 8.8 |
| 130.0 | 25 | 30.3 | 90.0 | 20.9 | 113.5 | 10.2 | 15.1 | 8.7 |
| 135.0 | 25 | 29.6 | 90.0 | 20.4 | 113.4 | 10.1 | 15.2 | 8.7 |
| 140.0 | 25 | 29.0 | 90.0 | 19.9 | 113.3 | 10.0 | 15.2 | 8.7 |
| 145.0 | 25 | 28.3 | 90.0 | 19.3 | 110.4 | 9.9 | 15.1 | 8.6 |
| 150.0 | 25 | 27.7 | 90.0 | 18.8 | 110.3 | 9.8 | 15.1 | 8.7 |
| 155.0 | 25 | 27.1 | 90.0 | 18.4 | 110.3 | 9.7 | 15.2 | 8.8 |
| 160.0 | 25 | 26.6 | 90.0 | 17.9 | 110.2 | 9.7 | 15.2 | 8.8 |
| 165.0 | 25 | 26.0 | 90.0 | 17.1 | 109.5 | 9.5 | 14.9 | 8.6 |
| 170.0 | 25 | 25.5 | 90.0 | 16.6 | 109.4 | 9.4 | 14.9 | 8.6 |
| 175.0 | 25 | 25.0 | 90.0 | 16.2 | 109.2 | 9.3 | 14.8 | 8.7 |
| 180.0 | 25 | 24.6 | 90.0 | 15.7 | 109.1 | 9.2 | 14.8 | 8.7 |
| 185.0 | 25 | 24.1 | 90.0 | 15.2 | 106.5 | 9.1 | 14.7 | 8.8 |
| 190.0 | 25 | 23.6 | 90.0 | 14.7 | 106.4 | 9.0 | 14.7 | 8.9 |
| 195.0 | 25 | 23.2 | 90.0 | 14.3 | 106.4 | 8.9 | 14.7 | 9.0 |
| 200.0 | 25 | 22.8 | 90.0 | 13.8 | 106.3 | 8.9 | 14.7 | 9.2 |
| 205.0 | 25 | 22.4 | 90.0 | 13.3 | 106.2 | 8.8 | 14.6 | 9.5 |
| 210.0 | 25 | 22.0 | 90.0 | 12.9 | 106.0 | 8.7 | 14.5 | 9.8 |
| 215.0 | 25 | 21.6 | 90.0 | 12.4 | 105.9 | 8.6 | 14.3 | 10.1 |
| 220.0 | 25 | 21.2 | 90.0 | 12.0 | 102.9 | 8.4 | 14.0 | 9.3 |
| 225.0 | 25 | 20.9 | 90.0 | 11.6 | 102.8 | 8.3 | 13.8 | 9.8 |
| 230.0 | 25 | 20.5 | 90.0 | 11.2 | 102.8 | 8.2 | 13.6 | 9.6 |
| 235.0 | 25 | 20.2 | 90.0 | 10.9 | 102.7 | 8.2 | 13.3 | 9.5 |
| 240.0 | 25 | 19.9 | 90.0 | 10.5 | 102.7 | 8.1 | 13.1 | 9.3 |
| 245.0 | 25 | 19.6 | 90.0 | 10.2 | 102.6 | 8.0 | 12.9 | 9.2 |
| 250.0 | 25 | 19.3 | 90.0 | 9.9 | 102.6 | 8.0 | 12.7 | 9.0 |
| 255.0 | 25 | 19.0 | 90.0 | 9.6 | 102.5 | 7.9 | 12.5 | 8.9 |
| 260.0 | 25 | 18.7 | 90.0 | 9.3 | 102.5 | 7.8 | 12.3 | 8.8 |
| 265.0 | 25 | 18.4 | 90.0 | 9.0 | 102.4 | 7.8 | 12.1 | 8.6 |
| 270.0 | 25 | 18.1 | 90.0 | 8.7 | 101.8 | 7.6 | 12.0 | 8.5 |
| 275.0 | 25 | 17.9 | 90.0 | 8.5 | 101.7 | 7.5 | 11.8 | 8.4 |
| 280.0 | 25 | 17.6 | 90.0 | 8.3 | 101.6 | 7.5 | 11.6 | 8.3 |
| 285.0 | 25 | 17.4 | 90.0 | 8.0 | 101.6 | 7.4 | 11.5 | 8.1 |



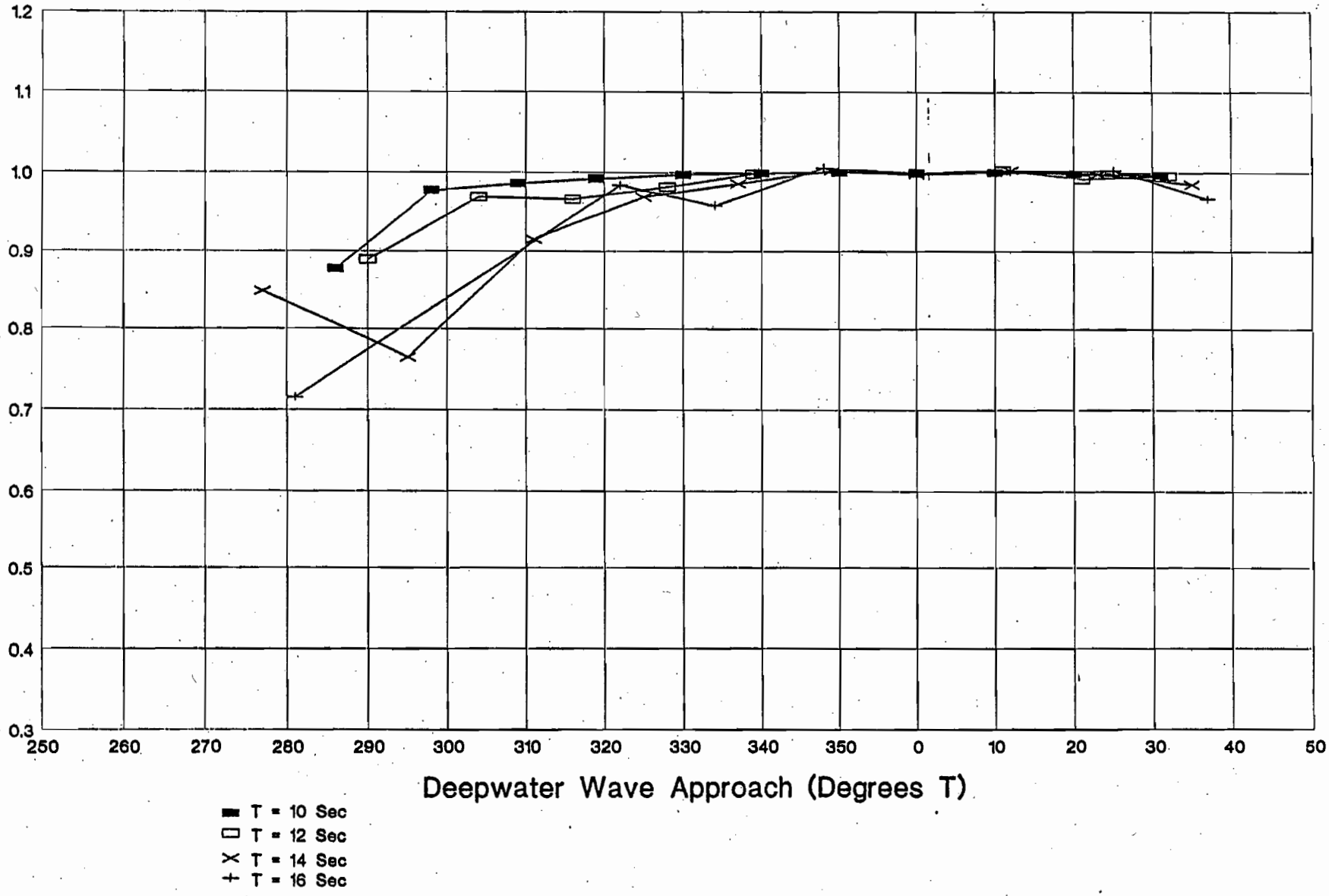

ND 1521

| | | | |
|---|---|---|---|
| Edward K. Noda and Associates, Inc. | Agana Sewage Treatment Plant Outfall Extension | Wave Refraction Model Grid Area | FIGURE |



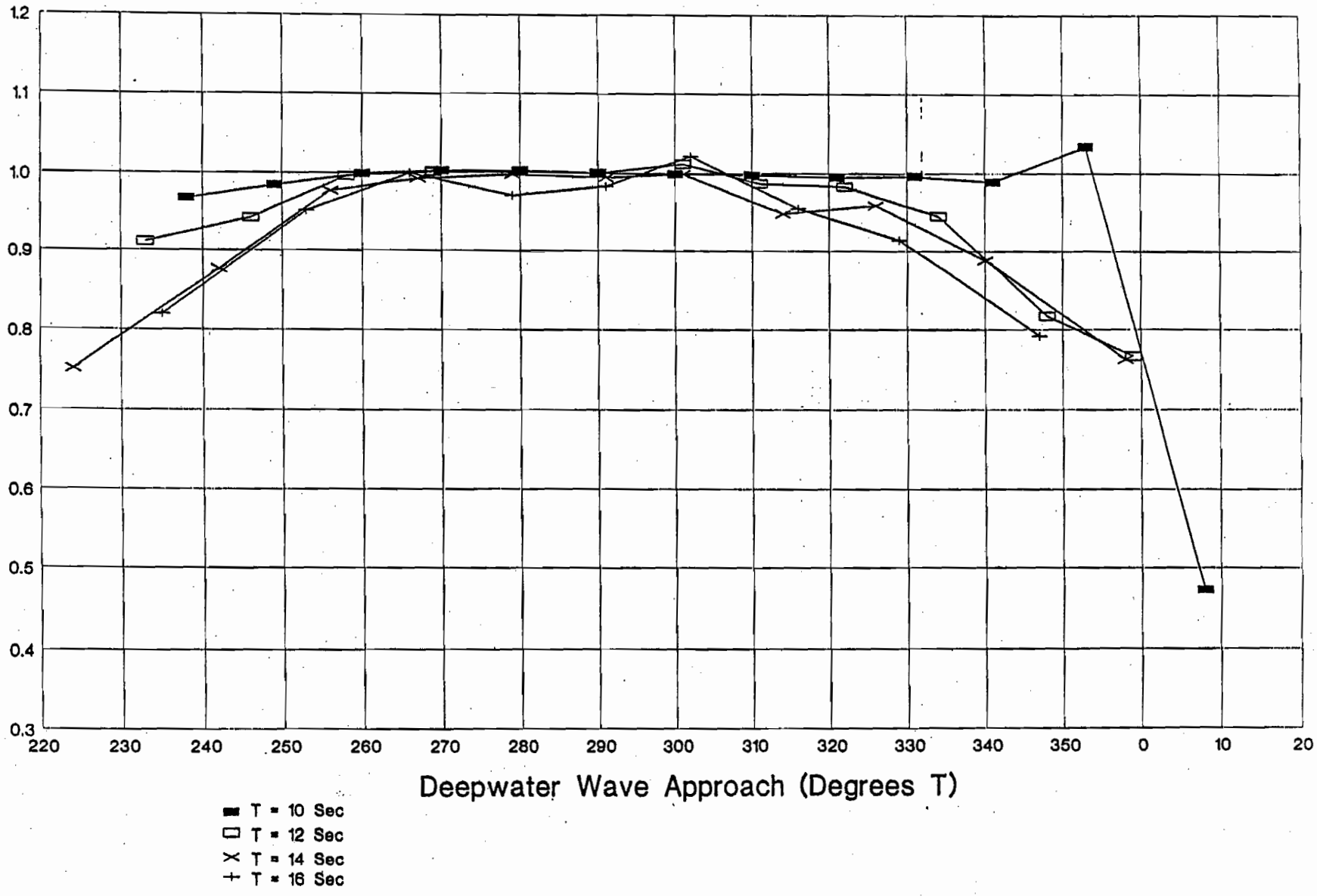

| | | | |
|---|---|---|---|
| Edward K. Noda and Associates, Inc. | Northern District Sewage Treatment Plant Outfall Extension | Wave Refraction Model Grid Area | FIGURE |

ND 1522



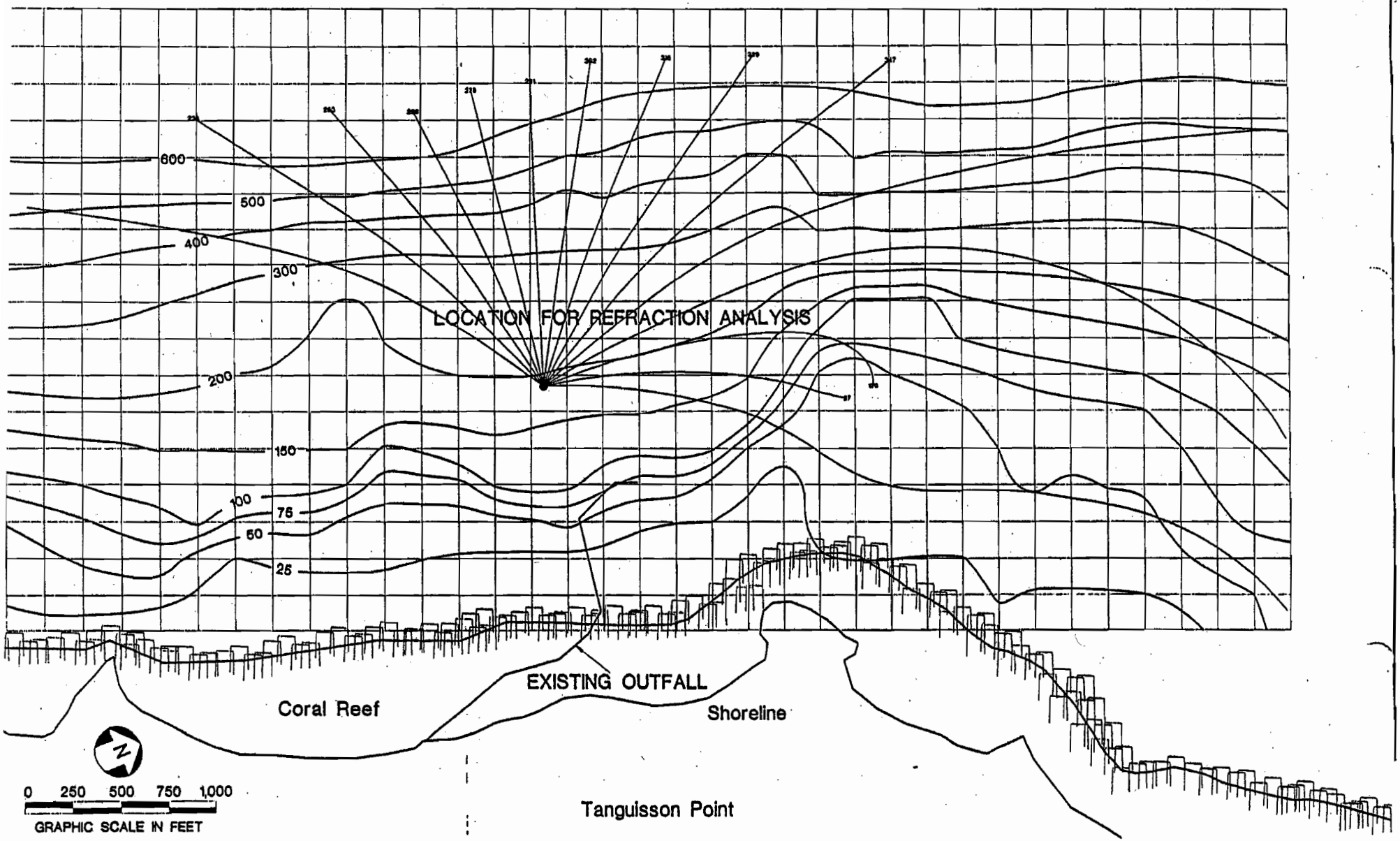

ND 1523

| | | | |
|---|---|---|---|
| Edward K. Noda and Associates, Inc. | Agana Sewage Treatment Plant Outfall Extension | Wave Refraction Coefficients | FIGURE |




ND 1524

| | | | |
|---|---|---|---|
| Edward K. Noda and Associates, Inc. | Northern District Sewage Treatment Plant Outfall Extension | Wave Refraction Coefficients | FIGURE |




| | | | |
|---|---|---|---|
| Edward K. Noda and Associates, Inc. | Northern District Sewage Treatment Plant Outfall Extension | Wave Refraction Model Grid Area<br>PERIOD = 16 sec Ho = 1 foot | FIGURE |

ND 1525

NEARSHORE POINT X=249071 Y=-93861 WAVE PERIOD T=16.0
DEPTH AT X,Y =185.9 C(X,Y)= 65.8 Ldeep= 1310.7 Cdeep= 81.9
Dmin=20.0 Dmax=655.48(Dmax/Ldeep= .50) Stepsz(Ds/L)= .10 Nmax=200
Brel= .05 Hdeep= 1.00

RAY NO. 1 Theta(Degrees)=143.00
RAY NO. 2 Theta(Degrees)=133.00
RAY NO. 3 Theta(Degrees)=123.00
RAY NO. 4 Theta(Degrees)=113.00
RAY NO. 5 Theta(Degrees)=103.00
RAY NO. 6 Theta(Degrees)= 93.00
RAY NO. 7 Theta(Degrees)= 83.00
RAY NO. 8 Theta(Degrees)= 73.00
RAY NO. 9 Theta(Degrees)= 63.00
RAY NO. 10 Theta(Degrees)= 53.00
RAY NO. 11 Theta(Degrees)= 43.00
RAY NO. 12 Theta(Degrees)= 33.00
RAY NO. 13 Theta(Degrees)= 23.00
RAY NO. 14 Theta(Degrees)= 13.00
RAY NO. 15 Theta(Degrees)= 3.00

CALCULATIONS FOR RAY NO. 1

CALCULATIONS FOR RAY NO. 2

Xi=249142 Yi=-93795 Depth=196.6 Kr= .819 Ks= .913 Bo= 65.3 Bs= 97.3

ORIGINAL RAY

| X(ft) | Y(ft) | Depth | Theta(Deg) | Cel | Ks | Kr | Ks*Kr*H | Hb |
|---|---|---|---|---|---|---|---|---|
| 247295 | -92457 | 652.0 | 147.6 | 81.6 | .990 | 1.000 | .990 | 0.0 |
| 247405 | -92527 | 635.0 | 147.5 | 81.6 | .989 | 1.000 | .989 | 0.0 |
| 247515 | -92597 | 621.5 | 147.4 | 81.5 | .988 | .999 | .987 | 0.0 |
| 247625 | -92667 | 591.5 | 147.3 | 81.4 | .985 | .997 | .982 | 0.0 |
| 247734 | -92738 | 550.0 | 147.0 | 81.1 | .980 | .995 | .974 | 0.0 |
| 247842 | -92808 | 503.2 | 146.6 | 80.7 | .973 | .991 | .964 | 0.0 |
| 247948 | -92879 | 456.1 | 145.9 | 80.1 | .964 | .984 | .948 | 0.0 |
| 248052 | -92951 | 403.1 | 144.8 | 79.0 | .951 | .973 | .925 | 0.0 |
| 248153 | -93024 | 352.1 | 143.6 | 77.4 | .939 | .958 | .899 | 0.0 |
| 248250 | -93097 | 319.1 | 142.5 | 76.1 | .930 | .946 | .880 | 0.0 |
| 248344 | -93171 | 288.9 | 141.1 | 74.5 | .923 | .934 | .862 | 0.0 |
| 248434 | -93245 | 267.8 | 139.8 | 73.2 | .919 | .922 | .847 | 0.0 |
| 248521 | -93321 | 254.9 | 138.5 | 72.3 | .917 | .913 | .837 | 0.0 |
| 248606 | -93397 | 242.8 | 137.2 | 71.3 | .915 | .903 | .826 | 0.0 |
| 248688 | -93474 | 227.5 | 136.3 | 70.1 | .914 | .891 | .814 | 0.0 |
| 248768 | -93552 | 222.4 | 135.5 | 69.6 | .913 | .878 | .802 | 0.0 |
| 248846 | -93630 | 216.6 | 134.9 | 69.1 | .913 | .863 | .788 | 0.0 |
| 248923 | -93707 | 208.5 | 134.5 | 68.3 | .913 | .848 | .774 | 0.0 |
| 248998 | -93785 | 202.6 | 134.1 | 67.7 | .913 | .834 | .762 | 0.0 |
| 249071 | -93861 | 185.9 | 133.0 | 65.8 | .914 | .819 | .749 | 0.0 |
| 249071 | -93861 | 185.9 | 133.0 | 65.8 | .914 | .819 | .749 | 0.0 |

DEEPWATER THETA(DEGREES TRUE) = 235.34

CALCULATIONS FOR RAY NO. 3

Xi=249132 Yi=-93822 Depth=192.0 Kr= .951 Ks= .914 Bo= 65.4 Bs= 72.3

ORIGINAL RAY

| X(ft) | Y(ft) | Depth | Theta(Deg) | Cel | Ks | Kr | Ks*Kr*H | Hb |
|---|---|---|---|---|---|---|---|---|
| 247997 | -92440 | 651.1 | 130.4 | 81.6 | .990 | 1.000 | .990 | 0.0 |
| 248082 | -92539 | 625.3 | 130.4 | 81.5 | .988 | 1.000 | .988 | 0.0 |
| 248166 | -92638 | 585.9 | 130.3 | 81.3 | .984 | 1.000 | .984 | 0.0 |
| 248250 | -92737 | 525.4 | 130.1 | 80.9 | .976 | .999 | .975 | 0.0 |
| 248332 | -92835 | 463.2 | 129.7 | 80.2 | .965 | .997 | .962 | 0.0 |
| 248412 | -92933 | 397.5 | 129.0 | 78.9 | .950 | .993 | .943 | 0.0 |
| 248489 | -93029 | 341.2 | 128.0 | 77.0 | .936 | .986 | .922 | 0.0 |
| 248562 | -93125 | 308.0 | 127.2 | 75.5 | .928 | .980 | .909 | 0.0 |
| 248633 | -93220 | 281.0 | 126.1 | 74.0 | .922 | .972 | .896 | 0.0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 248701 | -93315 | 260.9 | 125.3 | 72.7 | .918 | .965 | .886 | 0.0 |
| 248766 | -93408 | 238.4 | 124.6 | 71.0 | .915 | .959 | .877 | 0.0 |
| 248830 | -93500 | 228.7 | 124.3 | 70.2 | .914 | .956 | .873 | 0.0 |
| 248892 | -93592 | 219.0 | 124.0 | 69.3 | .913 | .953 | .870 | 0.0 |
| 248953 | -93683 | 210.9 | 123.8 | 68.5 | .913 | .952 | .869 | 0.0 |
| 249013 | -93773 | 202.9 | 123.5 | 67.7 | .913 | .952 | .869 | 0.0 |
| 249071 | -93861 | 185.9 | 123.0 | 65.8 | .914 | .951 | .869 | 0.0 |
| 249071 | -93861 | 185.9 | 123.0 | 65.8 | .914 | .951 | .869 | 0.0 |

DEEPWATER THETA(DEGREES TRUE) = 252.51

CALCULATIONS FOR RAY NO. 4

Xi=249131 Yi=-93835 Depth=189.3 Kr=1.000 Ks= .914 Bo= 65.3 Bs= 65.3

ORIGINAL RAY

| X(ft) | Y(ft) | Depth | Theta(Deg) | Cel | Ks | Kr | Ks*Kr*H | Hb |
|---|---|---|---|---|---|---|---|---|
| 248420 | -92469 | 628.0 | 117.2 | 81.5 | .988 | 1.000 | .988 | 0.0 |
| 248479 | -92585 | 601.7 | 117.1 | 81.4 | .986 | 1.000 | .986 | 0.0 |
| 248538 | -92700 | 535.6 | 117.0 | 81.0 | .978 | 1.000 | .977 | 0.0 |
| 248596 | -92815 | 457.8 | 116.8 | 80.1 | .964 | .999 | .963 | 0.0 |
| 248653 | -92927 | 393.5 | 116.3 | 78.7 | .949 | .999 | .948 | 0.0 |
| 248707 | -93038 | 339.7 | 115.6 | 77.0 | .935 | .998 | .934 | 0.0 |
| 248758 | -93147 | 304.1 | 115.0 | 75.3 | .927 | .997 | .924 | 0.0 |
| 248807 | -93254 | 273.2 | 114.3 | 73.5 | .920 | .994 | .915 | 0.0 |
| 248854 | -93359 | 247.4 | 113.8 | 71.7 | .916 | .990 | .907 | 0.0 |
| 248899 | -93462 | 231.2 | 113.5 | 70.4 | .914 | .986 | .902 | 0.0 |
| 248943 | -93564 | 220.6 | 113.4 | 69.4 | .913 | .984 | .899 | 0.0 |
| 248987 | -93665 | 211.5 | 113.2 | 68.6 | .913 | .986 | .900 | 0.0 |
| 249030 | -93764 | 202.9 | 113.3 | 67.7 | .913 | .992 | .906 | 0.0 |
| 249071 | -93861 | 185.9 | 113.0 | 65.8 | .914 | 1.000 | .914 | 0.0 |
| 249071 | -93861 | 185.9 | 113.0 | 65.8 | .914 | 1.000 | .914 | 0.0 |

DEEPWATER THETA(DEGREES TRUE) = 265.81

CALCULATIONS FOR RAY NO. 5

Xi=249139 Yi=-93845 Depth=187.1 Kr= .971 Ks= .914 Bo= 65.3 Bs= 69.3

ORIGINAL RAY

| X(ft) | Y(ft) | Depth | Theta(Deg) | Cel | Ks | Kr | Ks*Kr*H | Hb |
|---|---|---|---|---|---|---|---|---|
| 248704 | -92362 | 638.1 | 104.2 | 81.6 | .989 | 1.000 | .989 | 0.0 |
| 248736 | -92488 | 603.7 | 104.2 | 81.4 | .986 | 1.000 | .986 | 0.0 |
| 248768 | -92614 | 568.9 | 104.2 | 81.3 | .982 | 1.000 | .982 | 0.0 |
| 248800 | -92739 | 497.6 | 104.2 | 80.6 | .972 | .998 | .970 | 0.0 |
| 248831 | -92863 | 424.5 | 104.2 | 79.5 | .956 | .995 | .952 | 0.0 |
| 248862 | -92983 | 361.2 | 104.1 | 77.8 | .941 | .992 | .933 | 0.0 |
| 248891 | -93101 | 317.2 | 103.9 | 76.0 | .930 | .988 | .918 | 0.0 |
| 248919 | -93216 | 278.9 | 103.7 | 73.9 | .921 | .983 | .906 | 0.0 |
| 248946 | -93328 | 252.2 | 103.5 | 72.1 | .917 | .979 | .898 | 0.0 |
| 248972 | -93438 | 232.0 | 103.4 | 70.5 | .914 | .976 | .892 | 0.0 |
| 248998 | -93546 | 221.2 | 103.3 | 69.5 | .913 | .973 | .888 | 0.0 |
| 249023 | -93653 | 212.7 | 103.0 | 68.7 | .913 | .971 | .887 | 0.0 |
| 249047 | -93758 | 202.6 | 103.0 | 67.7 | .913 | .970 | .886 | 0.0 |
| 249071 | -93861 | 185.9 | 103.0 | 65.8 | .914 | .971 | .888 | 0.0 |
| 249071 | -93861 | 185.9 | 103.0 | 65.8 | .914 | .971 | .888 | 0.0 |

DEEPWATER THETA(DEGREES TRUE) = 278.80

CALCULATIONS FOR RAY NO. 6

Xi=249138 Yi=-93857 Depth=184.7 Kr= .983 Ks= .914 Bo= 65.3 Bs= 67.5

ORIGINAL RAY

| X(ft) | Y(ft) | Depth | Theta(Deg) | Cel | Ks | Kr | Ks*Kr*H | Hb |
|---|---|---|---|---|---|---|---|---|
| 249005 | -92320 | 630.6 | 91.7 | 81.5 | .989 | 1.000 | .989 | 0.0 |
| 249009 | -92450 | 587.7 | 91.8 | 81.4 | .984 | 1.000 | .984 | 0.0 |
| 249013 | -92580 | 537.9 | 91.9 | 81.0 | .978 | 1.000 | .978 | 0.0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 249018 | -92708 | 472.3 | 92.0 | 80.3 | .967 | 1.000 | .966 | 0.0 |
| 249022 | -92835 | 408.9 | 92.4 | 79.1 | .953 | .999 | .952 | 0.0 |
| 249028 | -92959 | 361.8 | 92.7 | 77.8 | .941 | .997 | .939 | 0.0 |
| 249034 | -93080 | 318.4 | 92.7 | 76.0 | .930 | .996 | .926 | 0.0 |
| 249039 | -93199 | 279.7 | 92.7 | 73.9 | .921 | .994 | .916 | 0.0 |
| 249045 | -93314 | 253.6 | 92.8 | 72.2 | .917 | .992 | .910 | 0.0 |
| 249050 | -93426 | 231.6 | 92.8 | 70.4 | .914 | .991 | .906 | 0.0 |
| 249056 | -93538 | 223.4 | 92.8 | 69.7 | .913 | .989 | .903 | 0.0 |
| 249061 | -93648 | 214.1 | 92.6 | 68.8 | .913 | .986 | .900 | 0.0 |
| 249066 | -93756 | 202.1 | 92.7 | 67.6 | .913 | .984 | .899 | 0.0 |
| 249071 | -93861 | 185.9 | 93.0 | 65.8 | .914 | .983 | .899 | 0.0 |
| 249071 | -93861 | 185.9 | 93.0 | 65.8 | .914 | .983 | .899 | 0.0 |

DEEPWATER THETA(DEGREES TRUE) = 291.27

CALCULATIONS FOR RAY NO. 7

Xi=249133 Yi=-93869 Depth=182.7 Kr=1.022 Ks= .915 Bo= 65.3 Bs= 62.5

ORIGINAL RAY

| X(ft) | Y(ft) | Depth | Theta(Deg) | Cel | Ks | Kr | Ks*Kr*H | Hb |
|---|---|---|---|---|---|---|---|---|
| 249317 | -92212 | 633.0 | 80.9 | 81.6 | .989 | 1.000 | .989 | 0.0 |
| 249296 | -92341 | 595.0 | 80.9 | 81.4 | .985 | 1.000 | .985 | 0.0 |
| 249276 | -92469 | 548.0 | 81.0 | 81.1 | .980 | 1.000 | .979 | 0.0 |
| 249256 | -92596 | 497.7 | 81.1 | 80.6 | .972 | 1.000 | .971 | 0.0 |
| 249236 | -92722 | 434.0 | 81.2 | 79.7 | .959 | 1.000 | .959 | 0.0 |
| 249217 | -92846 | 377.9 | 81.0 | 78.3 | .945 | 1.001 | .946 | 0.0 |
| 249197 | -92968 | 347.5 | 81.0 | 77.3 | .937 | 1.003 | .940 | 0.0 |
| 249178 | -93088 | 312.6 | 81.3 | 75.8 | .929 | 1.005 | .934 | 0.0 |
| 249161 | -93205 | 275.8 | 81.6 | 73.7 | .921 | 1.008 | .928 | 0.0 |
| 249144 | -93318 | 250.6 | 81.9 | 71.9 | .916 | 1.011 | .926 | 0.0 |
| 249129 | -93430 | 231.1 | 82.2 | 70.4 | .914 | 1.014 | .927 | 0.0 |
| 249114 | -93540 | 221.9 | 82.3 | 69.6 | .913 | 1.017 | .929 | 0.0 |
| 249099 | -93649 | 214.9 | 82.2 | 68.9 | .913 | 1.021 | .932 | 0.0 |
| 249084 | -93757 | 201.3 | 82.4 | 67.5 | .913 | 1.022 | .933 | 0.0 |
| 249071 | -93861 | 185.9 | 83.0 | 65.8 | .914 | 1.022 | .935 | 0.0 |
| 249071 | -93861 | 185.9 | 83.0 | 65.8 | .914 | 1.022 | .935 | 0.0 |

DEEPWATER THETA(DEGREES TRUE) = 302.19

CALCULATIONS FOR RAY NO. 8

Xi=249140 Yi=-93882 Depth=179.8 Kr= .955 Ks= .915 Bo= 65.3 Bs= 71.7

ORIGINAL RAY

| X(ft) | Y(ft) | Depth | Theta(Deg) | Cel | Ks | Kr | Ks*Kr*H | Hb |
|---|---|---|---|---|---|---|---|---|
| 249702 | -92187 | 621.9 | 66.6 | 81.5 | .988 | 1.000 | .988 | 0.0 |
| 249650 | -92306 | 573.9 | 66.7 | 81.3 | .983 | 1.000 | .983 | 0.0 |
| 249599 | -92425 | 528.6 | 66.8 | 81.0 | .977 | .999 | .976 | 0.0 |
| 249549 | -92544 | 487.6 | 67.2 | 80.5 | .970 | .998 | .968 | 0.0 |
| 249499 | -92662 | 448.5 | 67.6 | 79.9 | .962 | .998 | .960 | 0.0 |
| 249452 | -92780 | 414.3 | 68.2 | 79.3 | .954 | .997 | .952 | 0.0 |
| 249406 | -92896 | 378.2 | 68.8 | 78.3 | .945 | .996 | .941 | 0.0 |
| 249362 | -93011 | 337.5 | 69.3 | 76.9 | .935 | .994 | .929 | 0.0 |
| 249320 | -93124 | 300.1 | 69.8 | 75.1 | .926 | .990 | .917 | 0.0 |
| 249280 | -93234 | 266.6 | 70.5 | 73.1 | .919 | .986 | .906 | 0.0 |
| 249243 | -93342 | 244.1 | 71.1 | 71.4 | .915 | .982 | .899 | 0.0 |
| 249207 | -93448 | 228.7 | 71.5 | 70.2 | .914 | .981 | .896 | 0.0 |
| 249171 | -93554 | 222.7 | 71.5 | 69.6 | .913 | .979 | .894 | 0.0 |
| 249137 | -93658 | 211.5 | 71.6 | 68.6 | .913 | .973 | .888 | 0.0 |
| 249103 | -93761 | 202.9 | 72.1 | 67.7 | .913 | .964 | .880 | 0.0 |
| 249071 | -93861 | 185.9 | 73.0 | 65.8 | .914 | .955 | .873 | 0.0 |
| 249071 | -93861 | 185.9 | 73.0 | 65.8 | .914 | .955 | .873 | 0.0 |

DEEPWATER THETA(DEGREES TRUE) = 316.45

CALCULATIONS FOR RAY NO. 9

Xi=249141 Yi=-93896 Depth=177.0 Kr= .914 Ks= .916 Bo= 65.3 Bs= 78.1

ORIGINAL RAY

| X(ft) | Y(ft) | Depth | Theta(Deg) | Cel | Ks | Kr | Ks*Kr*H | Hb |
|---|---|---|---|---|---|---|---|---|
| 250165 | -92154 | 623.9 | 53.9 | 81.5 | .988 | 1.000 | .988 | 0.0 |
| 250089 | -92259 | 585.0 | 54.0 | 81.3 | .984 | 1.000 | .984 | 0.0 |
| 250013 | -92364 | 542.5 | 54.1 | 81.1 | .979 | .998 | .977 | 0.0 |
| 249937 | -92468 | 499.2 | 54.3 | 80.7 | .972 | .996 | .968 | 0.0 |
| 249863 | -92573 | 452.9 | 54.6 | 80.0 | .963 | .992 | .955 | 0.0 |
| 249790 | -92676 | 413.5 | 55.0 | 79.2 | .954 | .988 | .942 | 0.0 |
| 249718 | -92779 | 382.6 | 55.6 | 78.4 | .946 | .984 | .931 | 0.0 |
| 249649 | -92882 | 360.9 | 56.2 | 77.8 | .941 | .981 | .923 | 0.0 |
| 249581 | -92985 | 340.5 | 56.8 | 77.0 | .936 | .976 | .913 | 0.0 |
| 249515 | -93087 | 310.9 | 57.6 | 75.7 | .928 | .969 | .899 | 0.0 |
| 249453 | -93187 | 276.1 | 58.5 | 73.7 | .921 | .961 | .885 | 0.0 |
| 249393 | -93286 | 253.9 | 59.2 | 72.2 | .917 | .955 | .876 | 0.0 |
| 249336 | -93383 | 234.0 | 60.0 | 70.6 | .914 | .950 | .868 | 0.0 |
| 249280 | -93480 | 226.8 | 60.3 | 70.0 | .914 | .946 | .865 | 0.0 |
| 249225 | -93577 | 221.8 | 60.6 | 69.5 | .913 | .941 | .860 | 0.0 |
| 249172 | -93673 | 210.3 | 61.1 | 68.5 | .913 | .934 | .853 | 0.0 |
| 249120 | -93768 | 201.2 | 61.8 | 67.5 | .913 | .925 | .844 | 0.0 |
| 249071 | -93861 | 185.9 | 63.0 | 65.8 | .914 | .914 | .836 | 0.0 |
| 249071 | -93861 | 185.9 | 63.0 | 65.8 | .914 | .914 | .836 | 0.0 |

DEEPWATER THETA(DEGREES TRUE) = 329.20

CALCULATIONS FOR RAY NO. 10

Xi=249154 Yi=-93924 Depth=170.5 Kr= .792 Ks= .917 Bo= 65.3 Bs= 104.1

ORIGINAL RAY

| X(ft) | Y(ft) | Depth | Theta(Deg) | Cel | Ks | Kr | Ks*Kr*H | Hb |
|---|---|---|---|---|---|---|---|---|
| 250902 | -92159 | 636.8 | 36.2 | 81.6 | .989 | 1.000 | .989 | 0.0 |
| 250797 | -92236 | 602.9 | 36.3 | 81.4 | .986 | .999 | .985 | 0.0 |
| 250692 | -92313 | 565.3 | 36.5 | 81.2 | .982 | .999 | .980 | 0.0 |
| 250588 | -92390 | 511.8 | 36.7 | 80.8 | .974 | .998 | .972 | 0.0 |
| 250485 | -92467 | 468.2 | 37.1 | 80.3 | .966 | .997 | .963 | 0.0 |
| 250385 | -92544 | 424.3 | 37.8 | 79.5 | .956 | .996 | .952 | 0.0 |
| 250286 | -92622 | 385.7 | 38.5 | 78.5 | .947 | .994 | .941 | 0.0 |
| 250189 | -92700 | 364.9 | 39.1 | 77.9 | .942 | .989 | .932 | 0.0 |
| 250093 | -92779 | 361.7 | 40.0 | 77.8 | .941 | .982 | .924 | 0.0 |
| 249999 | -92860 | 347.9 | 41.2 | 77.3 | .937 | .974 | .913 | 0.0 |
| 249907 | -92941 | 330.8 | 42.3 | 76.6 | .933 | .960 | .896 | 0.0 |
| 249818 | -93024 | 314.0 | 43.4 | 75.8 | .929 | .944 | .877 | 0.0 |
| 249732 | -93107 | 294.5 | 44.6 | 74.8 | .924 | .924 | .855 | 0.0 |
| 249649 | -93191 | 273.7 | 45.9 | 73.6 | .920 | .906 | .833 | 0.0 |
| 249570 | -93275 | 255.9 | 47.0 | 72.3 | .917 | .889 | .816 | 0.0 |
| 249493 | -93358 | 238.1 | 48.1 | 71.0 | .915 | .873 | .798 | 0.0 |
| 249419 | -93442 | 227.6 | 48.7 | 70.1 | .914 | .860 | .786 | 0.0 |
| 249346 | -93526 | 223.3 | 49.1 | 69.7 | .913 | .848 | .774 | 0.0 |
| 249273 | -93610 | 218.5 | 49.6 | 69.2 | .913 | .834 | .762 | 0.0 |
| 249203 | -93694 | 208.1 | 50.5 | 68.2 | .913 | .820 | .749 | 0.0 |
| 249136 | -93778 | 199.2 | 51.6 | 67.3 | .913 | .806 | .736 | 0.0 |
| 249071 | -93861 | 185.9 | 53.0 | 65.8 | .914 | .792 | .724 | 0.0 |
| 249071 | -93861 | 185.9 | 53.0 | 65.8 | .914 | .792 | .724 | 0.0 |

DEEPWATER THETA(DEGREES TRUE) = 346.84

CALCULATIONS FOR RAY NO. 11

CALCULATIONS FOR RAY NO. 12

CALCULATIONS FOR RAY NO. 13

Depth<Depth MinDEEPWATER THETA(DEGREES TRUE) = 119.78

CALCULATIONS FOR RAY NO. 14

Depth<Depth MinDEEPWATER THETA(DEGREES TRUE) = 26.53

CALCULATIONS FOR RAY NO. 15

# WATER QUALITY DATA FOR THE PROPOSED OUTFALL LOCATIONS

| LOCATION | DESCRIPTION OF SITE & WATER QUALITY PARAMETERS | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HAGATNA: | GPS Coordinates | Date | Time of day | Depth ft | Turbidity NTU | Fecal Col. MPN | Temp. F | pH | D.O. | Salinity mg/L | P mg/L | Nitrate-N mg/L | O & G mg/L |
| HA-1 | N: 13 29.281 | 9/21/00 | 11:10 | 3 | 0.37 | <10 | 30.2 | 8.15 | 6.02 | 32000 | ND | 0.11 | ND |
| HA-2 | E: 144 44.737 | 9/21/00 | 11:00 | 150 | 0.19 | 41 | 29.7 | 8.15 | 5.53 | 31000 | ND | 0.059 | ND |
| HA-3 | | 9/21/00 | 11:00 | 287 | 0.6 | <10 | 29.6 | 8.18 | 6.27 | 32000 | ND | ND | ND |
| HB-1 | N: 13 29.211 | 9/21/00 | 12:50 | 3 | <10 | 0.24 | 29.9 | 8.13 | 5.96 | 31000 | ND | ND | ND |
| HB-2 | E: 144 44.963 | 9/21/00 | 12:40 | 140 | 0.22 | <10 | 29.6 | 8.18 | 6.07 | 32000 | ND | 0.065 | ND |
| HB-3 | | 9/21/00 | 12:07 | 280 | 0.21 | 10.1 | 29.4 | 8.15 | 6.01 | 32000 | ND | 0.059 | ND |
| HC-1 | N: 13 29.135 | 9/21/00 | 13:52 | 3 | 0.24 | <10 | 29.8 | 8.18 | 6.36 | 31000 | ND | ND | ND |
| HC-2 | E: 144 45.020 | 9/21/00 | 13:45 | 80 | 0.19 | 85 | 29.7 | 8.15 | 5.94 | 31000 | ND | ND | ND |
| HC-3 | | 9/21/00 | 13:30 | 160 | 0.31 | 10 | 29.6 | 8.13 | 5.65 | 32000 | ND | ND | ND |
| HD-1 | N: 13 29.160 | 9/21/00 | 14:43 | 3 | 0.32 | 19862 | 29.9 | 8.16 | 6.03 | 31000 | ND | ND | ND |
| HD-2 | E: 144 45.763 | 9/21/00 | 12:35 | 90 | 0.16 | <10 | 29.7 | 8.12 | 6.45 | 31000 | ND | ND | ND |
| HD-3 | | 9/21/00 | 14:30 | 170 | 0.22 | 63 | 29.6 | 8.14 | 5.92 | 31000 | ND | ND | ND |
| N. DISTRICT | | | | | | | | | | | | | |
| TA-1 | N: 13 33.182 | 9/22/00 | 8:03 | 3 | 0.24 | <10 | 29.9 | 8.13 | 5.18 | 32000 | ND | ND | ND |
| TA-2 | E: 144 48.403 | 9/22/00 | 7:59 | 85 | 0.23 | <10 | 29.9 | 8.13 | 6.05 | 32000 | ND | ND | ND |
| TA-3 | | 9/22/00 | 7:50 | 170 | 0.31 | <10 | 29.9 | 8.13 | 6.02 | 32000 | ND | ND | ND |
| TB-1 | N: 13 33. 178 | 9/22/00 | 9:52 | 3 | 0.25 | <10 | 29.9 | 8.17 | 6 | 32000 | ND | ND | ND |
| TB-2 | E: 144 48.453 | 9/22/00 | 9:47 | 65 | 0.17 | <10 | 29.7 | 8.21 | 6.31 | 32000 | ND | ND | ND |
| TB-3 | | 9/22/00 | 9:40 | 130 | 0.24 | <10 | 29.9 | 8.16 | 6.05 | 32000 | ND | ND | ND |
| TC-1 | N: 13 33.067 | 9/22/00 | 9:02 | 3 | 0.21 | <10 | 30 | 8.16 | 5.74 | 32000 | ND | ND | ND |
| TC-2 | E: 144 48.392 | 9/22/00 | 8:56 | 80 | 0.24 | <10 | 29.9 | 8.15 | 6.04 | 32000 | ND | ND | ND |
| TC-3 | | 9/22/00 | 8:46 | 150 | 0.21 | <10 | 29.7 | 8.15 | 5.88 | 32000 | ND | ND | ND |
| TD-1 | N: 13 33.068 | 9/22/00 | 10:45 | 3 | 0.22 | <10 | 30.2 | 8.18 | 6.13 | 31000 | ND | ND | ND |
| TD-2 | E: 144 48.442 | 9/22/00 | 10:40 | 40 | 0.24 | <10 | 29.8 | 8.21 | 6.06 | 33000 | ND | ND | ND |
| TD-3 | | 9/22/00 | 10:30 | 80 | 0.26 | <10 | 29.9 | 8.15 | 5.98 | 32000 | ND | ND | ND |

| NOTE: | |
|---|---|
| HA - HD | Hagatna Location - See Map |
| TA - TC | Northern District Location - See Map |
| P: | Phosphorus, Total Orthophosphate |
| O&G: | Oil & Grease |
| ND: | Not detected |

ND 1530

5

# OUTFALL CONSTRUCTION SCHEDULE

(Progress Report & Timeline Schedule)

PROGRESS REPORT FOR INVOICE NO. 5
JULY 2000
AGANA & NORTHERN DISTRICT STP OUTFALL EXTENSION
(Task XVI, Tumon Bay Beautification & Infrastructure Project)

Introduction

Recent activities have focused on preparation for the baseline monitoring, securing Federal and Guam permits to allow drilling on and beyond the reef, and start-up of the drilling process itself.

Baseline Monitoring

Sampling protocol has been developed for sediments which is consistent with that required by USEPA Region IX in other locations. An order for a Van Veen grab sampler has been placed with Kahlseo International Corp. and delivery is expected in three months. This equipment was selected because its proven utility for outfall surveys in California and Hawaii.

Geotechnical Investigations

Applications were filed with the Army Corp of Engineers (September 31, 1999) and Department of Land Management (September 14, 1999) to conduct offshore drilling. Concurrently, requests were made to the Bureau of Planning for a Guam Coastal Zone Management Consistency Statement (GCZMC) and Guam Environmental Protection Agency for a 401 Water Quality Determination. These permits and determinations were processed in following chronological order:

1. GCZMC consisting statement by Bureau of Planning received on November 8, 1999.

2. 401 Water Quality Determination from USEPA on November 24, 1999.

3. Waiver of Seashore Protection Permit by Department of Land Management December 22, 1999.

4. Department of Army Permit by ACOE May 12, 2000.

5. Approval of Water Quality Monitoring Plan by GEPA.

The lag between the DLM waiver and DA permit resulted from the need to determine the species and percent abundance of coral at each offshore site.

Drilling has begun at the Tanguisson site with one shore side and two reef test bores completed. A third reef bore was suspended by surge conditions generated by Typhoon Kirogi. A fifth bore will be made offshore. The drilling at Tanguisson and five corresponding test bores at the Agana site are expected to be completed by mid-August contingent upon sea shore conditions.

## NORTHERN DISTRICT OUTFALL CONSTRUCTION

| Item | Duration (days) | Start | Finish |
|---|---|---|---|
| GWA Review | 15 | 9/15/01 | 9/30/01 |
| Contractors' Bids | 45 | 10/01/01 | 11/15/01 |
| Contract Award | 60 | 11/16/01 | 1/15/02 |
| Submittal Review | 90 | 1/15/02 | 4/15/02 |
| Mobilize Offsite | 30 | 4/16/02 | 5/15/02 |
| Mobilize Onsite | 30 | 5/16/02 | 6/15/02 |
| Drill & Ream Pilot Hole | 15 | 6/16/02 | 6/30/02 |
| Install & Hydrotest Pipeline | 30 | 7/1/02 | 7/31/02 |
| Construct Junction Box | 31 | 8/1/02 | 8/31/02 |
| Install Diffuser | 90 | 8/1/02 | 10/30/02 |
| Demobilize | 30 | 10/31/02 | 11/30/02 |

## HAGÅTÑA OUTFALL CONSTRUCTION

| Item | Duration (days) | Start | Finish |
|---|---|---|---|
| GWA Review | 30 | 4/1/02 | 4/30/02 |
| Contractors' Bids | 45 | 5/1/02 | 6/15/02 |
| Contract Award | 60 | 6/16/02 | 8/17/02 |
| Submittal Review | 90 | 8/18/02 | 11/16/02 |
| Mobilize Offsite | 30 | 11/17/02 | 12/17/02 |
| Mobilize Onsite | 30 | 12/17/02 | 1/18/03 |
| Drill & Ream Pilot Hole | 15 | 1/19/03 | 2/1/03 |
| Install & Hydrotest Pipeline | 30 | 2/2/03 | 3/8/03 |
| Install Outfall Terminal Section | 30 | 3/9/03 | 4/9/03 |
| Demobilize Site | 30 | 4/10/03 | 5/9/03 |

a:3250/04:a:onstol

# DESIGN OF HAGÅTÑA & NORTHERN DISTRICT OUTFALLS

| Item | Critical Path | Duration (days) | Start | End |
|---|---|---|---|---|
| | Geotechnical Analysis & Report | 45 | 10/1/00 | 11/14/00 |
| | Bottom Profiling & Report | 60 | 10/15/00 | 11/29/00 |
| | HDD Feasibility Report | 45 | 11/30/00 | 1/12/01 |
| 30% | Basis of Design | 30 | 1/13/01 | 2/14/01 |
| | (2 week Government review) | | | |
| 60% | PSCE | 60 | 3/1/01 | 3/19/01 |
| | (2 week Government review) | | 4/2/01 | 5/28/01 |
| 90% | PSCE | 60 | 6/11/01 | 8/10/01 |
| | (2 week Government review) | | | |
| FINAL | PSCE | 17 | 8/27/01 | 9/14/01 |
| | **Non-Critical Path** | | | |
| | Sediment Sampling | 15 | 10/15/00 | 10/31/00 |
| | Water Quality Analysis | 21 | 9/20/00 | 10/15/00 |
| | Sediment Physical & Chemical Analysis | 21 | 11/6/00 | 11/24/00 |
| | Sediment Infauna Analysis | 120 | 11/1/00 | 2/28/01 |
| | Water & Sediment Quality Report | 15 | 3/1/01 | 3/15/01 |
| | Draft Environmental Impact Assessment | *in progress* | | 5/28/01 |
| | Final Environmental Impact Assessment | *in progress* | | 8/10/01 |

Wastewater O&M Progress Report
4th Quarter, FY 2000

6

# 1998 LABORATORY REPORT

# PRIORITY POLLUTANT SCAN

**MONTGOMERY WATSON LABORATORIES**

555 East Walnut Street
Pasadena, California 91101
818 568 6400; Fax: 818 568 6324;
1 800 566 LABS (1 800 566 5227)

# Laboratory Report

for

Guam Water Authority
Government of Guam

P.O.Box 3010

Agana, GUAM , USA 96910

Attention: Carmen Sian-Denton
Fax: (671) 637-2592



Wastewater
Report#: 41239
DRINKING

ND 1538

Report Summary of positive results, PR41239

| | | | Result | MDL | UNITS |
|---|---|---|---|---|---|
| Analyzed | 980311001 | COMP12 AGANA STP | | | |
| 03/16/98 | 4-Methylphenol | | 50 | 10.000 | UGL |
| 03/16/98 | Benzoic Acid | | 100 | ****** | UGL |
| 03/16/98 | Benzyl Alcohol | | 13 | 10.000 | UGL |
| 03/16/98 | Data Entry | | 03/17/98 | | -- |
| 03/16/98 | Di(2-Ethylhexyl)phthalate | | 23(B) | 8.000 | UGL |
| 03/13/98 | Copper, Total, ICAP | | 0.037 | .010 | MGL |
| 03/13/98 | Silver, Total, ICAP | | 0.01 | .010 | MGL |
| 03/13/98 | Zinc, Total, ICAP | | 0.087 | .020 | MGL |
| 03/24/98 | Data Entry | | 03/26/98 | | -- |
| 03/17/98 | Acetone | | 120 | 10.000 | UGL |
| 03/17/98 | Chloroform (Trichloromethane) | | 1.8 | .500 | UGL |
| 03/17/98 | Tetrachloroethylene (PCE) | | 2.0 | .500 | UGL |
| 03/17/98 | Toluene | | 1.2 | .500 | UGL |
| 03/17/98 | p-Dichlorobenzene (1,4-DCB) | | 1.2 | .500 | UGL |
| Analyzed | 980311002 | COMP12 NDSS | | | |
| 03/16/98 | 4-Methylphenol | | 46 | 25.000 | UGL |
| 03/16/98 | Data Entry | | 03/17/98 | | -- |
| 03/13/98 | Copper, Total, ICAP | | 0.053 | .010 | MGL |
| 03/13/98 | Zinc, Total, ICAP | | 0.21 | .020 | MGL |
| 03/24/98 | Data Entry | | 03/26/98 | | -- |
| 03/13/98 | Acetone | | 86 | 10.000 | UGL |
| '13/98 | Toluene | | 1.9 | .500 | UGL |
| 03/13/98 | p-Dichlorobenzene (1,4-DCB) | | 1.1 | .500 | UGL |
| 03/16/98 | Lead, Total, GF | | 2.9 | .002 | MGL |
| Analyzed | 980311003 | TB-5/21/97-R.V. & J.B.-HOLD | | | |
| Analyzed | 980311004 | TB-9/26/97-R.V. & J.B.-HOLD | | | |

More Data Available?

**MONTGOMERY WATSON LABORATORIES**

555 East Walnut Street
Pasadena, California 91101
818 568 6400; Fax: 818 568 6324;
1 800 566 LABS (1 800 566 5227)

Report
Comments
#41239

## Group Comments

(625) B indicates that the analyte is also detected in the method blank.
(624) Samples 980311001 and 980311002 were analyzed twice and the same surrogate failed in both samples both times. Result for TCDD analysis submitted by Quanterra Environmenta l Services.

**(980311001)**

**@BNA**
X2,Sample diluted due to matrix interference.

**AS-GF**
AS-GF analyzed by method 200.8.

**PB-GF**
PB-GF analyzed method 200.8.

**TL-GF**
TL-GF analyzed by method 200.8.

**(980311002)**

**@BNA**
X5,Sample diluted due to matrix interference.

**AS-GF**
AS-GF analyzed by method 200.8.

**PB-GF**
PB-GF analyzed by method 200.8.

**TL-GF**
TL-GF analyzed by method 200.8.

**ND 1540**

**MONTGOMERY WATSON LABORATORIES**

555 East Walnut Street
Pasadena, California 91101
818 568 6400; Fax: 818 568 6324;
1 800 566 LABS (1 800 566 5227)

Laboratory
Report
#41239

Guam Water Authority
Carmen Sian-Denton
Government of Guam
P.O.Box 3010
Agana, GUAM , USA 96910

Samples Received
11-mar-1998 10:44:10

| Prepared | Analyzed | QC Batch# | Method | Analyte | Result | Units | MDL | Dilution |
|---|---|---|---|---|---|---|---|---|
| **COMP12 AGANA STP (980311001) Sampled on 03/10/98** | | | | | | | | |
| 03/13/98 | 03/16/98 | 74594 | ( S3113B/E200.9 ) | Arsenic, Total, GF | ND | mg/l | 0.005 | 1 |
| | 03/11/98 | | ( ML/EPA 100.1 ) | Asbestos by TEM | <1.9 | MFL | 1.9 | 1 |
| 03/19/98 | 03/20/98 | 74822 | ( E335.2/E335.3 ) | Cyanide by manual distillation | ND | mg/l | 0.005 | 1 |
| 03/13/98 | 03/13/98 | 74456 | ( EPA/ML 245.1 ) | Mercury | ND | ug/l | 0.20 | 1 |
| 03/13/98 | 03/16/98 | 74596 | ( S3113B/200.9 ) | Lead, Total, GF | ND | mg/l | 0.002 | 1 |
| 03/13/98 | 03/18/98 | 74598 | ( S3113B/E200.9 ) | Selenium, Total, GF | ND | mg/l | 0.005 | 1 |
| 03/23/98 | 03/25/98 | 75332 | ( SUBCONTRACTED ) | 2,3,7,8-TCDD | ND | ng/l | 7.3 | 1 |
| 03/13/98 | 03/16/98 | 74597 | ( ML/EPA 279.2 ) | Thallium, Total, GF | ND | mg/l | 0.005 | 1 |
| | | | | **BNA Extractable** | | | | |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 1,2,4-Trichlorobenzene | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | o-Dichlorobenzene (1,2-DCB) | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 1,2-Diphenylhydrazine | ND | ug/l | 20 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | m-Dichlorobenzene (1,3-DCB) | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | p-Dichlorobenzene (1,4-DCB) | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 2,4,5-Trichlorophenol | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 2,4,6-Trichlorophenol | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 2,4-Dichlorophenol | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 2,4-Dimethylphenol | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 2,4-Dinitrophenol | ND | ug/l | 100 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 2,4-Dinitrotoluene | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 2,6-Dinitrotoluene | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 2-Chloronaphthalene | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 2-Chlorophenol | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 2-Methylnaphthalene | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 2-Methylphenol | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 2-Nitroaniline | ND | ug/l | 20 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 2-Nitrophenol | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 3,3'-Dichlorobenzidine | ND | ug/l | 100 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 3-Nitroaniline | ND | ug/l | 40 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 4,6-Dinitro-o-cresol | ND | ug/l | 100 | 2 |

**ND 1541**

**MONTGOMERY WATSON LABORATORIES**

555 East Walnut Street
Pasadena, California 91101
818 568 6400; Fax: 818 568 6324;
1 800 566 LABS (1 800 566 5227)

Laboratory
Report
#41239

Guam Water Authority
(continued)

| Prepared | Analyzed | QC Batch# | Method | Analyte | Result | Units | MDL | Dilution |
|---|---|---|---|---|---|---|---|---|
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 4-Bromophenylphenylether | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 4-Chloroaniline | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 4-Chlorophenylphenylether | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 4-Methylphenol | 50 | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 4-Nitroaniline | ND | ug/l | 40 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 4-Nitrophenol | ND | ug/l | 20 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Acenaphthene | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Acenaphthylene | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Aniline | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Anthracene | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Benzo(a)anthracene | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Benzo(a)pyrene | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Benzo(b)fluoranthene | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Benzo(g,h,i)perylene | ND | ug/l | 20 | 2 |
| 3/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Benzo(k)fluoranthene | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | bis(2-Chloroethyl)ether | ND | ug/l | 20 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | bis(2-Chloroethoxy)methane | ND | ug/l | 20 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | bis(2-Chloroisopropyl)ether | ND | ug/l | 20 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Di(2-Ethylhexyl)phthalate | 23(B) | ug/l | 8.0 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Butylbenzylphthalate | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Benzidine | ND | ug/l | 100 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Benzoic Acid | 100 | ug/l | 100 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Benzyl Alcohol | 13 | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Chrysene | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Dibenzo(a,h)anthracene | ND | ug/l | 20 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Dibenzofuran | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Diethylphthalate | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Dimethylphthalate | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Di-n-butylphthalate | ND | ug/l | 20 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Di-n-octylphthalate | ND | ug/l | 20 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Fluoranthene | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Fluorene | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Hexachlorobenzene | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Hexachlorobutadiene | ND | ug/l | 20 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Hexachlorocyclopentadiene | ND | ug/l | 20 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Hexachloroethane | ND | ug/l | 10 | 2 |

ND 1542

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Laboratory
Report
#41239

Guam Water Authority
(continued)

| Prepared | Analyzed | QC Batch# | Method | Analyte | Result | Units | MDL | Dilution |
|---|---|---|---|---|---|---|---|---|
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Indeno(1,2,3-c,d)pyrene | ND | ug/l | 20 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Isophorone | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Naphthalene | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Nitrobenzene | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | N-Nitrosodimethylamine | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | N-Nitrosodi-N-propylamine | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | N-Nitrosodiphenylamine | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | p-Chloro-m-cresol | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Pentachlorophenol | ND | ug/l | 20 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Phenanthrene | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Phenol | ND | ug/l | 10 | 2 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Pyrene | ND | ug/l | 10 | 2 |
| | | | ( Surrogate ) | 2,4,6-Tribromophenol | 89 | % Rec | | |
| | | | ( Surrogate ) | 2-Fluorobiphenyl | 86 | % Rec | | |
| | | | ( Surrogate ) | 2-Fluorophenol | 77 | % Rec | | |
| | | | ( Surrogate ) | Nitrobenzene-d5 | 89 | % Rec | | |
| | | | ( Surrogate ) | Phenol-d5 | 148 | % Rec | | |
| | | | ( Surrogate ) | Terphenyl-d14 | 34 | % Rec | | |
| | | | **Pesticides/PCBs** | | | | | |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | PCB 1016 Aroclor | ND | ug/l | 5.0 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | PCB 1221 Aroclor | ND | ug/l | 5.0 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | PCB 1232 Aroclor | ND | ug/l | 5.0 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | PCB 1242 Aroclor | ND | ug/l | 5.0 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | PCB 1248 Aroclor | ND | ug/l | 5.0 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | PCB 1254 Aroclor | ND | ug/l | 5.0 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | PCB 1260 Aroclor | ND | ug/l | 5.0 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | Alpha-BHC | ND | ug/l | 0.20 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | Aldrin | ND | ug/l | 0.20 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | Beta-BHC | ND | ug/l | 0.20 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | Chlordane | ND | ug/l | 2.0 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | Delta-BHC | ND | ug/l | 0.20 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | p,p' DDD | ND | ug/l | 0.20 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | p,p' DDE | ND | ug/l | 0.20 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | p,p' DDT | ND | ug/l | 0.20 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | Dieldrin | ND | ug/l | 0.20 | 10 |

**ND 1543**

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Guam Water Authority
(continued)

| Prepared | Analyzed | QC Batch# | Method | Analyte | Result | Units | MDL | Dilution |
|---|---|---|---|---|---|---|---|---|
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | Endrin Aldehyde | ND | ug/l | 0.20 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | Endrin | ND | ug/l | 0.10 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | Endosulfan I (alpha) | ND | ug/l | 0.20 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | Endosulfan II (beta) | ND | ug/l | 0.20 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | Endosulfan sulfate | ND | ug/l | 0.20 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | Gamma-BHC | ND | ug/l | 0.20 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | Heptachlor | ND | ug/l | 0.10 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | Heptachlor Epoxide | ND | ug/l | 0.10 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | Methoxychlor | ND | ug/l | 2.0 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | Toxaphene | ND | ug/l | 5.0 | 10 |
| | | | ( Surrogate ) | Dibutyl Chlorendate | 40 | % Rec | | |
| | | | | **Priority Pollutant Metals - IC** | | | | |
| 03/12/98 | 03/13/98 | 74588 | ( EPA/ML 200.7 ) | Silver, Total, ICAP | 0.01 | mg/l | 0.010 | 1 |
| 3/12/98 | 03/13/98 | 74588 | ( EPA/ML 200.7 ) | Beryllium, Total, ICAP | ND | mg/l | 0.0010 | 1 |
| 03/12/98 | 03/13/98 | 74588 | ( EPA/ML 200.7 ) | Cadmium, Total, ICAP | ND | mg/l | 0.005 | 1 |
| 03/12/98 | 03/13/98 | 74588 | ( EPA/ML 200.7 ) | Chromium, Total, ICAP | ND | mg/l | 0.010 | 1 |
| 03/12/98 | 03/13/98 | 74588 | ( EPA/ML 200.7 ) | Copper, Total, ICAP | 0.037 | mg/l | 0.010 | 1 |
| 03/12/98 | 03/13/98 | 74588 | ( EPA/ML 200.7 ) | Nickel, Total, ICAP | ND | mg/l | 0.010 | 1 |
| 03/12/98 | 03/13/98 | 74588 | ( EPA/ML 200.7 ) | Antimony, Total, ICAP | ND | mg/l | 0.050 | 1 |
| 03/12/98 | 03/13/98 | 74588 | ( EPA/ML 200.7 ) | Zinc, Total, ICAP | 0.087 | mg/l | 0.020 | 1 |
| | | | | **Volatile Organics HSL** | | | | |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | 1,1,2-Trichloroethane (1,1,2-T | ND | ug/l | 0.50 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | 1,1-Dichloroethylene (1,1DCE) | ND | ug/l | 0.50 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | 1,1-Dichloroethane | ND | ug/l | 0.50 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | o-Dichlorobenzene (1,2-DCB) | ND | ug/l | 0.50 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | 1,2-Dichloroethane | ND | ug/l | 0.50 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | 1,2-Dichloropropane | ND | ug/l | 0.50 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | m-Dichlorobenzene (1,3-DCB) | ND | ug/l | 0.50 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | p-Dichlorobenzene (1,4-DCB) | 1.2 | ug/l | 0.50 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | 2-Butanone (MEK) | ND | ug/l | 10 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | 2-Hexanone | ND | ug/l | 10 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | 4-Methyl-2-Pentanone (MIBK) | ND | ug/l | 10 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | Acetone | 120 | ug/l | 10 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | Acrolein | ND | ug/l | 200 | 1 |

ND 1544

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Laboratory
Report
#41239

Guam Water Authority
(continued)

| Prepared | Analyzed | QC Batch# | Method | Analyte | Result | Units | MDL | Dilution |
|---|---|---|---|---|---|---|---|---|
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | Acrylonitrile | ND | ug/l | 50 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | Benzene | ND | ug/l | 0.50 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | cis-1,2-Dichloroethene | ND | ug/l | 0.50 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | Chlorobenzene | ND | ug/l | 0.50 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | cis-1,3-Dichloropropene | ND | ug/l | 0.50 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | Bromoform | ND | ug/l | 0.50 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | Chloroform (Trichloromethane) | 1.8 | ug/l | 0.50 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | Chloroethane | ND | ug/l | 0.50 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | Carbon disulfide | ND | ug/l | 0.50 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | Carbon Tetrachloride | ND | ug/l | 0.50 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | Dibromochloromethane | ND | ug/l | 0.50 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | Dichlorobromomethane | ND | ug/l | 0.50 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | Ethyl benzene | ND | ug/l | 0.50 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 524.2 ) | Dichlorodifluoromethane | ND | ug/l | 0.50 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | Methyl Bromide | ND | ug/l | 1.0 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | Methyl Chloride | ND | ug/l | 1.0 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | Methylene Chloride | ND | ug/l | 3.0 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | m,p-Xylenes | ND | ug/l | 0.50 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | o-Xylene | ND | ug/l | 0.50 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | 1,1,2,2-Tetrachloroethane | ND | ug/l | 0.50 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | Tetrachloroethylene (PCE) | 2.0 | ug/l | 0.50 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | Styrene | ND | ug/l | 0.50 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | trans-1,2-Dichloroethene | ND | ug/l | 0.50 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | 1,1,1-Trichloroethane | ND | ug/l | 0.50 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | Trichloroethylene (TCE) | ND | ug/l | 0.50 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | Trichlorofluoromethane | ND | ug/l | 0.50 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | trans-1,3-Dichloropropene | ND | ug/l | 0.50 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | Tetrahydrofuran | ND | ug/l | 10 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | Toluene | 1.2 | ug/l | 0.50 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | Vinyl Chloride (VC) | ND | ug/l | 0.50 | 1 |
| | 03/17/98 | 74720 | ( ML/EPA 624 ) | Vinyl Acetate | ND | ug/l | 10 | 1 |
| | | | ( Surrogate ) | 1,2-Dichloroethane-d4 | 117 | % Rec | | |
| | | | ( Surrogate ) | 4-Bromofluorobenzene | 93 | % Rec | | |
| | | | ( Surrogate ) | Toluene-d8 | 99 | % Rec | | |

*ND 1545*

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Laboratory
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#41239

Guam Water Authority
(continued)

| Prepared | Analyzed | QC Batch# | Method | Analyte | Result | Units | MDL | Dilution |
|---|---|---|---|---|---|---|---|---|
| **COMP12 NDSS (980311002) Sampled on 03/09/98** | | | | | | | | |
| 03/13/98 | 03/16/98 | 74594 | ( S3113B/E200.9 ) | Arsenic, Total, GF | ND | mg/l | 0.005 | 1 |
| | 03/11/98 | | ( ML/EPA 100.1 ) | Asbestos by TEM | <3.3 | MFL | 3.3 | 1 |
| 03/19/98 | 03/20/98 | 74822 | ( E335.2/E335.3 ) | Cyanide by manual distillation | ND | mg/l | 0.005 | 1 |
| 03/13/98 | 03/13/98 | 74456 | ( EPA/ML 245.1 ) | Mercury | ND | ug/l | 0.20 | 1 |
| 03/13/98 | 03/16/98 | 74596 | ( S3113B/200.9 ) | Lead, Total, GF | 2.9 | mg/l | 0.002 | 1 |
| 03/13/98 | 03/16/98 | 74598 | ( S3113B/E200.9 ) | Selenium, Total, GF | ND | mg/l | 0.005 | 1 |
| 03/23/98 | 03/25/98 | 75332 | ( SUBCONTRACTED ) | 2,3,7,8-TCDD | ND | ng/l | 7.9 | 1 |
| 03/13/98 | 03/16/98 | 74597 | ( ML/EPA 279.2 ) | Thallium, Total, GF | ND | mg/l | 0.005 | 1 |
| | | | | **BNA Extractable** | | | | |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 1,2,4-Trichlorobenzene | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | o-Dichlorobenzene (1,2-DCB) | ND | ug/l | 25 | 5 |
| /12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 1,2-Diphenylhydrazine | ND | ug/l | 50 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | m-Dichlorobenzene (1,3-DCB) | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | p-Dichlorobenzene (1,4-DCB) | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 2,4,5-Trichlorophenol | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 2,4,6-Trichlorophenol | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 2,4-Dichlorophenol | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 2,4-Dimethylphenol | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 2,4-Dinitrophenol | ND | ug/l | 250 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 2,4-Dinitrotoluene | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 2,6-Dinitrotoluene | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 2-Chloronaphthalene | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 2-Chlorophenol | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 2-Methylnaphthalene | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 2-Methylphenol | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 2-Nitroaniline | ND | ug/l | 50 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 2-Nitrophenol | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 3,3'-Dichlorobenzidine | ND | ug/l | 250 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 3-Nitroaniline | ND | ug/l | 100 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 4,6-Dinitro-o-cresol | ND | ug/l | 250 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 4-Bromophenylphenylether | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 4-Chloroaniline | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 4-Chlorophenylphenylether | ND | ug/l | 25 | 5 |

ND 1546

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Guam Water Authority
(continued)

| Prepared | Analyzed | QC Batch# | Method | Analyte | Result | Units | MDL | Dilution |
|---|---|---|---|---|---|---|---|---|
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 4-Methylphenol | 46 | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 4-Nitroaniline | ND | ug/l | 100 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | 4-Nitrophenol | ND | ug/l | 50 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Acenaphthene | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Acenaphthylene | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Aniline | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Anthracene | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Benzo(a)anthracene | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Benzo(a)pyrene | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Benzo(b)fluoranthene | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Benzo(g,h,i)perylene | ND | ug/l | 50 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Benzo(k)fluoranthene | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | bis(2-Chloroethyl)ether | ND | ug/l | 50 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | bis(2-Chloroethoxy)methane | ND | ug/l | 50 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | bis(2-Chloroisopropyl)ether | ND | ug/l | 50 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Di(2-Ethylhexyl)phthalate | ND | ug/l | 20 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Butylbenzylphthalate | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Benzidine | ND | ug/l | 250 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Benzoic Acid | ND | ug/l | 250 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Benzyl Alcohol | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Chrysene | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Dibenzo(a,h)anthracene | ND | ug/l | 50 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Dibenzofuran | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Diethylphthalate | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Dimethylphthalate | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Di-n-butylphthalate | ND | ug/l | 50 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Di-n-octylphthalate | ND | ug/l | 50 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Fluoranthene | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Fluorene | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Hexachlorobenzene | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Hexachlorobutadiene | ND | ug/l | 50 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Hexachlorocyclopentadiene | ND | ug/l | 50 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Hexachloroethane | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Indeno(1,2,3-c,d)pyrene | ND | ug/l | 50 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Isophorone | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Naphthalene | ND | ug/l | 25 | 5 |

ND 1547

**MONTGOMERY WATSON LABORATORIES**

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Laboratory
Report
#41239

Guam Water Authority
(continued)

| Prepared | Analyzed | QC Batch# | Method | Analyte | Result | Units | MDL | Dilution |
|---|---|---|---|---|---|---|---|---|
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Nitrobenzene | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | N-Nitrosodimethylamine | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | N-Nitrosodi-N-propylamine | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | N-Nitrosodiphenylamine | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | p-Chloro-m-cresol | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Pentachlorophenol | ND | ug/l | 50 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Phenanthrene | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Phenol | ND | ug/l | 25 | 5 |
| 03/12/98 | 03/16/98 | 74668 | ( ML/EPA 625 ) | Pyrene | ND | ug/l | 25 | 5 |
| | | | ( Surrogate ) | 2,4,6-Tribromophenol | 82 | % Rec | | |
| | | | ( Surrogate ) | 2-Fluorobiphenyl | 76 | % Rec | | |
| | | | ( Surrogate ) | 2-Fluorophenol | 74 | % Rec | | |
| | | | ( Surrogate ) | Nitrobenzene-d5 | 79 | % Rec | | |
| | | | ( Surrogate ) | Phenol-d5 | 151 | % Rec | | |
| | | | ( Surrogate ) | Terphenyl-d14 | 37 | % Rec | | |
| | | | **Pesticides/PCBs** | | | | | |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | PCB 1016 Aroclor | ND | ug/l | 5.0 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | PCB 1221 Aroclor | ND | ug/l | 5.0 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | PCB 1232 Aroclor | ND | ug/l | 5.0 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | PCB 1242 Aroclor | ND | ug/l | 5.0 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | PCB 1248 Aroclor | ND | ug/l | 5.0 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | PCB 1254 Aroclor | ND | ug/l | 5.0 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | PCB 1260 Aroclor | ND | ug/l | 5.0 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | Alpha-BHC | ND | ug/l | 0.20 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | Aldrin | ND | ug/l | 0.20 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | Beta-BHC | ND | ug/l | 0.20 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | Chlordane | ND | ug/l | 2.0 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | Delta-BHC | ND | ug/l | 0.20 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | p,p' DDD | ND | ug/l | 0.20 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | p,p' DDE | ND | ug/l | 0.20 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | p,p' DDT | ND | ug/l | 0.20 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | Dieldrin | ND | ug/l | 0.20 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | Endrin Aldehyde | ND | ug/l | 0.20 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | Endrin | ND | ug/l | 0.10 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | Endosulfan I (alpha) | ND | ug/l | 0.20 | 10 |

ND 1548

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Report
#41239

Guam Water Authority
(continued)

| Prepared | Analyzed | QC Batch# | Method | Analyte | Result | Units | MDL | Dilution |
|---|---|---|---|---|---|---|---|---|
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | Endosulfan II (beta) | ND | ug/l | 0.20 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | Endosulfan sulfate | ND | ug/l | 0.20 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | Gamma-BHC | ND | ug/l | 0.20 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | Heptachlor | ND | ug/l | 0.10 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | Heptachlor Epoxide | ND | ug/l | 0.10 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | Methoxychlor | ND | ug/l | 2.0 | 10 |
| 03/14/98 | 03/24/98 | 74999 | ( ML/EPA 608 ) | Toxaphene | ND | ug/l | 5.0 | 10 |
| | | | ( Surrogate ) | Dibutyl Chlorendate | 32 | % Rec | | |
| | | | **Priority Pollutant Metals - IC** | | | | | |
| 03/12/98 | 03/13/98 | 74588 | ( EPA/ML 200.7 ) | Silver, Total, ICAP | ND | mg/l | 0.010 | 1 |
| 03/12/98 | 03/13/98 | 74588 | ( EPA/ML 200.7 ) | Beryllium, Total, ICAP | ND | mg/l | 0.0010 | 1 |
| 03/12/98 | 03/13/98 | 74588 | ( EPA/ML 200.7 ) | Cadmium, Total, ICAP | ND | mg/l | 0.005 | 1 |
| 03/12/98 | 03/13/98 | 74588 | ( EPA/ML 200.7 ) | Chromium, Total, ICAP | ND | mg/l | 0.010 | 1 |
| 03/12/98 | 03/13/98 | 74588 | ( EPA/ML 200.7 ) | Copper, Total, ICAP | 0.053 | mg/l | 0.010 | 1 |
| 03/12/98 | 03/13/98 | 74588 | ( EPA/ML 200.7 ) | Nickel, Total, ICAP | ND | mg/l | 0.010 | 1 |
| 03/12/98 | 03/13/98 | 74588 | ( EPA/ML 200.7 ) | Antimony, Total, ICAP | ND | mg/l | 0.050 | 1 |
| 03/12/98 | 03/13/98 | 74588 | ( EPA/ML 200.7 ) | Zinc, Total, ICAP | 0.21 | mg/l | 0.020 | 1 |
| | | | **Volatile Organics HSL** | | | | | |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | 1,1,2-Trichloroethane (1,1,2-T | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | 1,1-Dichloroethylene (1,1DCE) | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | 1,1-Dichloroethane | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | o-Dichlorobenzene (1,2-DCB) | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | 1,2-Dichloroethane | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | 1,2-Dichloropropane | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | m-Dichlorobenzene (1,3-DCB) | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | p-Dichlorobenzene (1,4-DCB) | 1.1 | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | 2-Butanone (MEK) | ND | ug/l | 10 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | 2-Hexanone | ND | ug/l | 10 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | 4-Methyl-2-Pentanone (MIBK) | ND | ug/l | 10 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Acetone | 86 | ug/l | 10 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Acrolein | ND | ug/l | 200 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Acrylonitrile | ND | ug/l | 50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Benzene | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | cis-1,2-Dichloroethene | ND | ug/l | 0.50 | 1 |

ND 1549

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Laboratory
Report
#41239

Guam Water Authority
(continued)

| Prepared | Analyzed | QC Batch# | Method | Analyte | Result | Units | MDL | Dilution |
|---|---|---|---|---|---|---|---|---|
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Chlorobenzene | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | cis-1,3-Dichloropropene | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Bromoform | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Chloroform (Trichloromethane) | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Chloroethane | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Carbon disulfide | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Carbon Tetrachloride | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Dibromochloromethane | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Dichlorobromomethane | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Ethyl benzene | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 524.2 ) | Dichlorodifluoromethane | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Methyl Bromide | ND | ug/l | 1.0 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Methyl Chloride | ND | ug/l | 1.0 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Methylene Chloride | ND | ug/l | 3.0 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | m,p-Xylenes | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | o-Xylene | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | 1,1,2,2-Tetrachloroethane | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Tetrachloroethylene (PCE) | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Styrene | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | trans-1,2-Dichloroethene | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | 1,1,1-Trichloroethane | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Trichloroethylene (TCE) | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Trichlorofluoromethane | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | trans-1,3-Dichloropropene | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Tetrahydrofuran | ND | ug/l | 10 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Toluene | 1.9 | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Vinyl Chloride (VC) | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Vinyl Acetate | ND | ug/l | 10 | 1 |
| | | | ( Surrogate ) | 1,2-Dichloroethane-d4 | 125 | % Rec | | |
| | | | ( Surrogate ) | 4-Bromofluorobenzene | 83 | % Rec | | |
| | | | ( Surrogate ) | Toluene-d8 | 103 | % Rec | | |

ND 1550

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Laboratory
Report
#41239

Guam Water Authority
(continued)

| Prepared | Analyzed | QC Batch# | Method | Analyte | Result | Units | MDL | Dilution |
|---|---|---|---|---|---|---|---|---|
| **TB-5/21/97-R.V. & J.B.-HOLD (980311003) Sampled on 03/10/98** | | | | | | | | |
| | | | | **Volatile Organics HSL** | | | | |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | 1,1,2-Trichloroethane (1,1,2-T | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | 1,1-Dichloroethylene (1,1DCE) | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | 1,1-Dichloroethane | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | o-Dichlorobenzene (1,2-DCB) | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | 1,2-Dichloroethane | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | 1,2-Dichloropropane | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | m-Dichlorobenzene (1,3-DCB) | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | p-Dichlorobenzene (1,4-DCB) | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | 2-Butanone (MEK) | ND | ug/l | 10 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | 2-Hexanone | ND | ug/l | 10 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | 4-Methyl-2-Pentanone (MIBK) | ND | ug/l | 10 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Acetone | ND | ug/l | 10 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Acrolein | ND | ug/l | 200 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Acrylonitrile | ND | ug/l | 50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Benzene | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | cis-1,2-Dichloroethene | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Chlorobenzene | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | cis-1,3-Dichloropropene | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Bromoform | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Chloroform (Trichloromethane) | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Chloroethane | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Carbon disulfide | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Carbon Tetrachloride | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Dibromochloromethane | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Dichlorobromomethane | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Ethyl benzene | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 524.2 ) | Dichlorodifluoromethane | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Methyl Bromide | ND | ug/l | 1.0 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Methyl Chloride | ND | ug/l | 1.0 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Methylene Chloride | ND | ug/l | 3.0 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | m,p-Xylenes | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | o-Xylene | ND | ug/l | 0.50 | 1 |

ND 1551

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Guam Water Authority
(continued)

| Prepared | Analyzed | QC Batch# | Method | Analyte | Result | Units | MDL | Dilution |
|---|---|---|---|---|---|---|---|---|
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | 1,1,2,2-Tetrachloroethane | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Tetrachloroethylene (PCE) | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Styrene | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | trans-1,2-Dichloroethene | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | 1,1,1-Trichloroethane | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Trichloroethylene (TCE) | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Trichlorofluoromethane | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | trans-1,3-Dichloropropene | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Tetrahydrofuran | ND | ug/l | 10 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Toluene | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Vinyl Chloride (VC) | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Vinyl Acetate | ND | ug/l | 10 | 1 |
| | | | ( Surrogate ) | 1,2-Dichloroethane-d4 | 101 | % Rec | | |
| | | | ( Surrogate ) | 4-Bromofluorobenzene | 102 | % Rec | | |
| | | | ( Surrogate ) | Toluene-d8 | 100 | % Rec | | |

**TB-9/26/97-R.V. & J.B.-HOLD (980311004)  Sampled on 03/09/98**

**Volatile Organics HSL**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | 1,1,2-Trichloroethane (1,1,2-T | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | 1,1-Dichloroethylene (1,1DCE) | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | 1,1-Dichloroethane | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | o-Dichlorobenzene (1,2-DCB) | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | 1,2-Dichloroethane | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | 1,2-Dichloropropane | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | m-Dichlorobenzene (1,3-DCB) | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | p-Dichlorobenzene (1,4-DCB) | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | 2-Butanone (MEK) | ND | ug/l | 10 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | 2-Hexanone | ND | ug/l | 10 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | 4-Methyl-2-Pentanone (MIBK) | ND | ug/l | 10 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Acetone | ND | ug/l | 10 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Acrolein | ND | ug/l | 200 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Acrylonitrile | ND | ug/l | 50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Benzene | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | cis-1,2-Dichloroethene | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Chlorobenzene | ND | ug/l | 0.50 | 1 |

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Guam Water Authority
(continued)

| Prepared | Analyzed | QC Batch# | Method | Analyte | Result | Units | MDL | Dilution |
|---|---|---|---|---|---|---|---|---|
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | cis-1,3-Dichloropropene | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Bromoform | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Chloroform (Trichloromethane) | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Chloroethane | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Carbon disulfide | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Carbon Tetrachloride | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Dibromochloromethane | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Dichlorobromomethane | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Ethyl benzene | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 524.2 ) | Dichlorodifluoromethane | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Methyl Bromide | ND | ug/l | 1.0 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Methyl Chloride | ND | ug/l | 1.0 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Methylene Chloride | ND | ug/l | 3.0 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | m,p-Xylenes | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | o-Xylene | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | 1,1,2,2-Tetrachloroethane | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Tetrachloroethylene (PCE) | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Styrene | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | trans-1,2-Dichloroethene | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | 1,1,1-Trichloroethane | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Trichloroethylene (TCE) | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Trichlorofluoromethane | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | trans-1,3-Dichloropropene | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Tetrahydrofuran | ND | ug/l | 10 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Toluene | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Vinyl Chloride (VC) | ND | ug/l | 0.50 | 1 |
| | 03/13/98 | 74719 | ( ML/EPA 624 ) | Vinyl Acetate | ND | ug/l | 10 | 1 |
| | | | ( Surrogate ) | 1,2-Dichloroethane-d4 | 105 | % Rec | | |
| | | | ( Surrogate ) | 4-Bromofluorobenzene | 96 | % Rec | | |
| | | | ( Surrogate ) | Toluene-d8 | 97 | % Rec | | |

*ND 1553*

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## QC Batch #74456 Mercury

| QC | Analyte | Spiked | Recovered | Yield (%) | Limits (%) | RPD (%) |
|---|---|---|---|---|---|---|
| LCS1 | Mercury | 1.56 | 1.35 | 86.5 | ( 85.00 - 115.00 ) | |
| LCS2 | Mercury | 1.56 | 1.41 | 90.4 | ( 85.00 - 115.00 ) | 4.3 |
| MBLK | Mercury | ND | | | | |
| MS | Mercury | 1.56 | 1.41 | 90.4 | ( 80.00 - 120.00 ) | |
| MSD | Mercury | 1.56 | 1.38 | 88.5 | ( 80.00 - 120.00 ) | 2.2 |

## QC Batch #74588 Priority Pollutant Metals - IC

| QC | Analyte | Spiked | Recovered | Yield (%) | Limits (%) | RPD (%) |
|---|---|---|---|---|---|---|
| LCS1 | Antimony, Total, ICAP | 0.500 | 0.451 | 90.2 | ( 85.00 - 115.00 ) | |
| LCS2 | Antimony, Total, ICAP | 0.500 | 0.452 | 90.4 | ( 85.00 - 115.00 ) | 0.22 |
| MBLK | Antimony, Total, ICAP | ND | | | | |
| MS | Antimony, Total, ICAP | 0.50 | 0.449 | 89.8 | ( 70.00 - 120.00 ) | |
| MSD | Antimony, Total, ICAP | 1.00 | 0.97 | 97.0 | ( 70.00 - 120.00 ) | |
| LCS1 | Beryllium, Total, ICAP | 0.05 | 0.0477 | 95.4 | ( 78.00 - 105.00 ) | |
| LCS2 | Beryllium, Total, ICAP | 0.05 | 0.0470 | 94.0 | ( 78.00 - 105.00 ) | 1.5 |
| MBLK | Beryllium, Total, ICAP | ND | | | | |
| MS | Beryllium, Total, ICAP | 0.050 | 0.0463 | 92.6 | ( 80.00 - 120.00 ) | |
| MSD | Beryllium, Total, ICAP | 0.100 | 0.094 | 94.0 | ( 80.00 - 120.00 ) | |
| LCS1 | Cadmium, Total, ICAP | 0.200 | 0.192 | 96.0 | ( 85.00 - 108.00 ) | |
| LCS2 | Cadmium, Total, ICAP | 0.200 | 0.186 | 93.0 | ( 85.00 - 108.00 ) | 3.2 |
| MBLK | Cadmium, Total, ICAP | ND | | | | |
| MS | Cadmium, Total, ICAP | 0.20 | 0.177 | 88.5 | ( 80.00 - 120.00 ) | |
| MSD | Cadmium, Total, ICAP | 0.40 | 0.358 | 89.5 | ( 80.00 - 120.00 ) | |
| LCS1 | Chromium, Total, ICAP | 1.00 | 0.97 | 97.0 | ( 90.00 - 106.00 ) | |
| LCS2 | Chromium, Total, ICAP | 1.00 | 0.97 | 97.0 | ( 90.00 - 106.00 ) | 0.00 |
| MBLK | Chromium, Total, ICAP | ND | | | | |
| MS | Chromium, Total, ICAP | 1.00 | 0.95 | 95.0 | ( 80.00 - 120.00 ) | |
| MSD | Chromium, Total, ICAP | 2.00 | 1.90 | 95.0 | ( 80.00 - 120.00 ) | |
| LCS1 | Copper, Total, ICAP | 1.00 | 1.00 | 100.0 | ( 93.00 - 111.00 ) | |
| LCS2 | Copper, Total, ICAP | 1.00 | 0.99 | 99.0 | ( 93.00 - 111.00 ) | 1.0 |
| MBLK | Copper, Total, ICAP | ND | | | | |
| MS | Copper, Total, ICAP | 1.00 | 0.95 | 95.0 | ( 80.00 - 120.00 ) | |
| MSD | Copper, Total, ICAP | 2.00 | 1.89 | 94.5 | ( 80.00 - 120.00 ) | |
| LCS1 | Nickel, Total, ICAP | 0.5 | 0.496 | 99.2 | ( 90.00 - 108.00 ) | |

Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining.
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| | | | | | | |
|---|---|---|---|---|---|---|
| LCS2 | Nickel, Total, ICAP | 0.5 | 0.486 | 97.2 | ( 90.00 - 108.00 ) | 2.0 |
| MBLK | Nickel, Total, ICAP | ND | | | | |
| MS | Nickel, Total, ICAP | 0.50 | 0.463 | 92.6 | ( 80.00 - 120.00 ) | |
| MSD | Nickel, Total, ICAP | 1.00 | 0.94 | 94.0 | ( 80.00 - 120.00 ) | |
| LCS1 | Silver, Total, ICAP | 0.50 | 0.553 | 110.6 | ( 82.00 - 112.00 ) | |
| LCS2 | Silver, Total, ICAP | 0.50 | 0.549 | 109.8 | ( 82.00 - 112.00 ) | 0.73 |
| MBLK | Silver, Total, ICAP | ND | | | | |
| MS | Silver, Total, ICAP | 0.50 | 0.459 | 91.8 | ( 70.00 - 120.00 ) | |
| MSD | Silver, Total, ICAP | 1.00 | 0.97 | 97.0 | ( 70.00 - 120.00 ) | |
| LCS1 | Zinc, Total, ICAP | 1.00 | 1.00 | 100.0 | ( 88.00 - 115.00 ) | |
| LCS2 | Zinc, Total, ICAP | 1.00 | 0.99 | 99.0 | ( 88.00 - 115.00 ) | 1.0 |
| MBLK | Zinc, Total, ICAP | ND | | | | |
| MS | Zinc, Total, ICAP | 1.00 | 0.95 | 95.0 | ( 80.00 - 120.00 ) | |
| MSD | Zinc, Total, ICAP | 2.00 | 1.88 | 94.0 | ( 80.00 - 120.00 ) | |

## QC Batch #74594 Arsenic, Total, GF

| QC | Analyte | Spiked | Recovered | Yield (%) | Limits (%) | RPD (%) |
|---|---|---|---|---|---|---|
| LCS1 | Arsenic, Total, GF | 0.020 | 0.0176 | 88.0 | ( 85.00 - 115.00 ) | |
| LCS2 | Arsenic, Total, GF | 0.020 | 0.0199 | 99.5 | ( 85.00 - 115.00 ) | 12 |
| MBLK | Arsenic, Total, GF | ND | | | | |
| MS | Arsenic, Total, GF | 0.020 | 0.0189 | 94.5 | ( 85.00 - 115.00 ) | |
| MSD | Arsenic, Total, GF | 0.020 | 0.0167 | 83.5 | ( 85.00 - 115.00 ) | 12 |

## QC Batch #74596 Lead, Total, GF

| QC | Analyte | Spiked | Recovered | Yield (%) | Limits (%) | RPD (%) |
|---|---|---|---|---|---|---|
| LCS1 | Lead, Total, GF | 0.020 | 0.0191 | 95.5 | ( 85.00 - 115.00 ) | |
| LCS2 | Lead, Total, GF | 0.020 | 0.0188 | 94.0 | ( 85.00 - 115.00 ) | 1.6 |
| MBLK | Lead, Total, GF | ND | | | | |
| MS | Lead, Total, GF | 0.020 | 0.0202 | 101.0 | ( 85.00 - 115.00 ) | |
| MSD | Lead, Total, GF | 0.020 | 0.0195 | 97.5 | ( 85.00 - 115.00 ) | 3.5 |

**Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining.**
**Criteria for MS and DUP are not applicable for ICR monitoring.**



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## QC Batch #74597 Thallium, Total, GF

| QC | Analyte | Spiked | Recovered | Yield (%) | Limits (%) | RPD (%) |
|---|---|---|---|---|---|---|
| LCS1 | Thallium, Total, GF | 0.020 | 0.0189 | 94.5 | ( 85.00 - 115.00 ) | |
| LCS2 | Thallium, Total, GF | 0.020 | 0.0179 | 89.5 | ( 85.00 - 115.00 ) | 5.4 |
| MBLK | Thallium, Total, GF | ND | | | | |
| MS | Thallium, Total, GF | 0.020 | 0.0230 | 115.0 | ( 75.00 - 125.00 ) | |
| MSD | Thallium, Total, GF | 0.020 | 0.0225 | 112.5 | ( 75.00 - 125.00 ) | 2.2 |

## QC Batch #74598 Selenium, Total, GF

| QC | Analyte | Spiked | Recovered | Yield (%) | Limits (%) | RPD (%) |
|---|---|---|---|---|---|---|
| LCS1 | Selenium, Total, GF | 0.020 | 0.0182 | 91.0 | ( 85.00 - 115.00 ) | |
| LCS2 | Selenium, Total, GF | 0.020 | 0.0184 | 92.0 | ( 85.00 - 115.00 ) | 1.1 |
| MBLK | Selenium, Total, GF | ND | | | | |
| MS | Selenium, Total, GF | 0.020 | 0.0080 | 40.0 | ( 85.00 - 115.00 ) | |
| MSD | Selenium, Total, GF | 0.020 | 0.0077 | 38.5 | ( 85.00 - 115.00 ) | 3.8 |

## QC Batch #74668 BNA Extractable

| QC | Analyte | Spiked | Recovered | Yield (%) | Limits (%) | RPD (%) |
|---|---|---|---|---|---|---|
| LCS1 | 1,2,4-Trichlorobenzene | 50 | 38.3 | 76.6 | ( 44.00 - 117.00 ) | |
| MBLK | 1,2,4-Trichlorobenzene | ND | | | | |
| MS | 1,2,4-Trichlorobenzene | 50 | 36.6 | 73.2 | ( 44.00 - 117.00 ) | |
| MBLK | 1,2-Diphenylhydrazine | ND | | | | |
| MBLK | 2,4,5-Trichlorophenol | ND | | | | |
| MBLK | 2,4,6-Trichlorophenol | ND | | | | |
| MBLK | 2,4-Dichlorophenol | ND | | | | |
| MBLK | 2,4-Dimethylphenol | ND | | | | |
| MBLK | 2,4-Dinitrophenol | ND | | | | |
| LCS1 | 2,4-Dinitrotoluene | 50 | 33.8 | 67.6 | ( 39.00 - 121.00 ) | |
| MBLK | 2,4-Dinitrotoluene | ND | | | | |
| MS | 2,4-Dinitrotoluene | 50 | 28.8 | 57.6 | ( 39.00 - 121.00 ) | |

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| | | | | | |
|---|---|---|---|---|---|
| MBLK | 2,6-Dinitrotoluene | ND | | | |
| MBLK | 2-Chloronaphthalene | ND | | | |
| LCS1 | 2-Chlorophenol | 100 | 63.7 | 63.7 | ( 37.00 - 95.00 ) |
| MBLK | 2-Chlorophenol | ND | | | |
| MS | 2-Chlorophenol | 100 | 66.5 | 66.5 | ( 27.00 - 123.00 ) |
| MBLK | 2-Methylnaphthalene | ND | | | |
| MBLK | 2-Methylphenol | ND | | | |
| MBLK | 2-Nitroaniline | ND | | | |
| MBLK | 2-Nitrophenol | ND | | | |
| MBLK | 3,3'-Dichlorobenzidine | ND | | | |
| MBLK | 3-Nitroaniline | ND | | | |
| MBLK | 4,6-Dinitro-o-cresol | ND | | | |
| MBLK | 4-Bromophenylphenylether | ND | | | |
| MBLK | 4-Chloroaniline | ND | | | |
| MBLK | 4-Chlorophenylphenylether | ND | | | |
| MBLK | 4-Methylphenol | ND | | | |
| MBLK | 4-Nitroaniline | ND | | | |
| LCS1 | 4-Nitrophenol | 100 | 55.8 | 55.8 | ( 1.00 - 160.00 ) |
| MBLK | 4-Nitrophenol | ND | | | |
| MS | 4-Nitrophenol | 100 | 41.2 | 41.2 | ( 10.00 - 80.00 ) |
| LCS1 | Acenaphthene | 50 | 28.5 | 57.0 | ( 47.00 - 102.00 ) |
| MBLK | Acenaphthene | ND | | | |
| MS | Acenaphthene | 50 | 27.8 | 55.6 | ( 47.00 - 102.00 ) |
| MBLK | Acenaphthylene | ND | | | |
| MBLK | Aniline | ND | | | |
| MBLK | Anthracene | ND | | | |
| MBLK | Benzidine | ND | | | |
| MBLK | Benzo(a)anthracene | ND | | | |
| MBLK | Benzo(a)pyrene | ND | | | |
| MBLK | Benzo(b)fluoranthene | ND | | | |
| MBLK | Benzo(g,h,i)perylene | ND | | | |
| MBLK | Benzo(k)fluoranthene | ND | | | |
| MBLK | Benzoic Acid | ND | | | |
| MBLK | Benzyl Alcohol | ND | | | |
| MBLK | Butylbenzylphthalate | ND | | | |
| MBLK | Chrysene | ND | | | |
| MBLK | Di(2-Ethylhexyl)phthalate | ND | 9.8 | | |

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| | | | | | |
|---|---|---|---|---|---|
| MBLK | Di-n-butylphthalate | ND | | | |
| MS | Di-n-butylphthalate | 100 | 44.2 | 44.2 | ( 11.00 - 117.00 ) |
| MBLK | Di-n-octylphthalate | ND | | | |
| MBLK | Dibenzo(a,h)anthracene | ND | | | |
| MBLK | Dibenzofuran | ND | | | |
| MBLK | Diethylphthalate | ND | | | |
| MBLK | Dimethylphthalate | ND | | | |
| MBLK | Fluoranthene | ND | | | |
| MBLK | Fluorene | ND | | | |
| MBLK | Hexachlorobenzene | ND | | | |
| MBLK | Hexachlorobutadiene | ND | | | |
| MBLK | Hexachlorocyclopentadiene | ND | | | |
| MBLK | Hexachloroethane | ND | | | |
| MBLK | Indeno(1,2,3-c,d)pyrene | ND | | | |
| MBLK | Isophorone | ND | | | |
| LCS1 | N-Nitrosodi-N-propylamine | 50 | 30.2 | 60.4 | ( 21.00 - 110.00 ) |
| MBLK | N-Nitrosodi-N-propylamine | ND | | | |
| MS | N-Nitrosodi-N-propylamine | 50 | 31.7 | 63.4 | ( 21.00 - 110.00 ) |
| MBLK | N-Nitrosodimethylamine | ND | | | |
| MBLK | N-Nitrosodiphenylamine | ND | | | |
| MBLK | Naphthalene | ND | | | |
| MBLK | Nitrobenzene | ND | | | |
| LCS1 | Pentachlorophenol | 100 | 85.7 | 85.7 | ( 22.00 - 137.00 ) |
| MBLK | Pentachlorophenol | ND | | | |
| MS | Pentachlorophenol | 100 | 69.1 | 69.1 | ( 9.00 - 103.00 ) |
| MBLK | Phenanthrene | ND | | | |
| LCS1 | Phenol | 100 | 56.2 | 56.2 | ( 43.00 - 79.00 ) |
| MBLK | Phenol | ND | | | |
| MS | Phenol | 100 | 65.4 | 65.4 | ( 12.00 - 89.00 ) |
| LCS1 | Pyrene | 50 | 36.4 | 72.8 | ( 52.00 - 115.00 ) |
| MBLK | Pyrene | ND | | | |
| MS | Pyrene | 50 | 23.5 | 47.0 | ( 25.00 - 99.00 ) |
| MBLK | bis(2-Chloroethoxy)methane | ND | | | |
| MBLK | bis(2-Chloroethyl)ether | ND | | | |
| MBLK | bis(2-Chloroisopropyl)ether | ND | | | |
| MBLK | m-Dichlorobenzene (1,3-DCB) | ND | | | |
| MBLK | o-Dichlorobenzene (1,2-DCB) | ND | | | |

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| | | | | | |
|---|---|---|---|---|---|
| LCS1 | p-Chloro-m-cresol | 100 | 69.7 | 69.7 | ( 35.00 - 90.00 ) |
| MBLK | p-Chloro-m-cresol | ND | | | |
| MS | p-Chloro-m-cresol | 100 | 62.5 | 62.5 | ( 23.00 - 97.00 ) |
| LCS1 | p-Dichlorobenzene (1,4-DCB) | 50 | 33.2 | 66.4 | ( 25.00 - 99.00 ) |
| MBLK | p-Dichlorobenzene (1,4-DCB) | ND | | | |
| MS | p-Dichlorobenzene (1,4-DCB) | 50 | 34.5 | 69.0 | ( 25.00 - 99.00 ) |

## QC Batch #74719 Volatile Organics HSL

| QC | Analyte | Spiked | Recovered | Yield (%) | Limits (%) | RPD (%) |
|---|---|---|---|---|---|---|
| MBLK | 1,1,1-Trichloroethane | ND | | | | |
| MBLK | 1,1,2,2-Tetrachloroethane | ND | | | | |
| MBLK | 1,1,2-Trichloroethane (1,1,2-T | ND | | | | |
| MBLK | 1,1-Dichloroethane | ND | | | | |
| LCS1 | 1,1-Dichloroethylene (1,1DCE) | 4 | 2.89 | 72.2 | ( 57.00 - 154.00 ) | |
| MBLK | 1,1-Dichloroethylene (1,1DCE) | ND | | | | |
| MS | 1,1-Dichloroethylene (1,1DCE) | 4 | 3.85 | 96.2 | ( 57.00 - 154.00 ) | |
| MSD | 1,1-Dichloroethylene (1,1DCE) | 4 | 3.73 | 93.2 | ( 57.00 - 154.00 ) | 3.2 |
| MBLK | 1,2-Dichloroethane | ND | | | | |
| MBLK | 1,2-Dichloropropane | ND | | | | |
| MBLK | 2-Butanone (MEK) | ND | | | | |
| MBLK | 2-Chloroethylvinylether | ND | | | | |
| MBLK | 2-Hexanone | ND | | | | |
| MBLK | 4-Methyl-2-Pentanone (MIBK) | ND | | | | |
| MBLK | Acetone | ND | | | | |
| MBLK | Acrolein | ND | | | | |
| MBLK | Acrylonitrile | ND | | | | |
| LCS1 | Benzene | 4 | 3.29 | 82.2 | ( 75.00 - 124.00 ) | |
| MBLK | Benzene | ND | | | | |
| MS | Benzene | 4 | 4.21 | 105.2 | ( 75.00 - 124.00 ) | |
| MSD | Benzene | 4 | 4.45 | 111.2 | ( 75.00 - 124.00 ) | 5.5 |
| MBLK | Bromoform | ND | | | | |
| MBLK | Carbon Tetrachloride | ND | | | | |
| MBLK | Carbon disulfide | ND | | | | |
| LCS1 | Chlorobenzene | 4 | 3.96 | 99.0 | ( 74.00 - 121.00 ) | |
| MBLK | Chlorobenzene | ND | | | | |

Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining.
Criteria for MS and DUP are not applicable for ICR monitoring.

**MONTGOMERY WATSON LABORATORIES**

555 East Walnut Street
Pasadena, California 91101
818 568 6400; Fax: 818 568 6324;
1 800 566 LABS (1 800 566 5227)

Laboratory
QC Report
#41239

Guam Water Authority
(continued)

| | | | | | | |
|---|---|---|---|---|---|---|
| MS | Chlorobenzene | 4 | 4.24 | 106.0 | ( 74.00 - 121.00 ) | |
| MSD | Chlorobenzene | 4 | 4.49 | 112.2 | ( 74.00 - 121.00 ) | 5.7 |
| MBLK | Chloroethane | ND | | | | |
| MBLK | Chloroform (Trichloromethane) | ND | | | | |
| MBLK | Dibromochloromethane | ND | | | | |
| MBLK | Dichlorobromomethane | ND | | | | |
| MBLK | Dichlorodifluoromethane | ND | | | | |
| MBLK | Ethyl benzene | ND | | | | |
| MBLK | Methyl Bromide | ND | | | | |
| MBLK | Methyl Chloride | ND | | | | |
| MBLK | Methylene Chloride | ND | | | | |
| MBLK | Styrene | ND | | | | |
| MBLK | Tetrachloroethylene (PCE) | ND | | | | |
| MBLK | Tetrahydrofuran | ND | | | | |
| LCS1 | Toluene | 4 | 3.68 | 92.0 | ( 76.00 - 120.00 ) | |
| MBLK | Toluene | ND | | | | |
| MS | Toluene | 4 | 4.21 | 105.2 | ( 76.00 - 120.00 ) | |
| MSD | Toluene | 4 | 4.37 | 109.2 | ( 76.00 - 120.00 ) | 3.7 |
| LCS1 | Trichloroethylene (TCE) | 4 | 3.50 | 87.5 | ( 78.00 - 121.00 ) | |
| MBLK | Trichloroethylene (TCE) | ND | | | | |
| MS | Trichloroethylene (TCE) | 4 | 4.43 | 110.8 | ( 78.00 - 121.00 ) | |
| MSD | Trichloroethylene (TCE) | 4 | 4.45 | 111.2 | ( 78.00 - 121.00 ) | 0.45 |
| MBLK | Trichlorofluoromethane | ND | | | | |
| MBLK | Vinyl Acetate | ND | | | | |
| MBLK | Vinyl Chloride (VC) | ND | | | | |
| MBLK | cis-1,2-Dichloroethene | ND | | | | |
| MBLK | cis-1,3-Dichloropropene | ND | | | | |
| MBLK | m,p-Xylenes | ND | | | | |
| MBLK | m-Dichlorobenzene (1,3-DCB) | ND | | | | |
| MBLK | o-Dichlorobenzene (1,2-DCB) | ND | | | | |
| MBLK | o-Xylene | ND | | | | |
| MBLK | p-Dichlorobenzene (1,4-DCB) | ND | | | | |
| MBLK | trans-1,2-Dichloroethene | ND | | | | |
| MBLK | trans-1,3-Dichloropropene | ND | | | | |

Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining.
Criteria for MS and DUP are not applicable for ICR monitoring.

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Guam Water Authority
(continued)

## QC Batch #74720 Volatile Organics HSL

| QC | Analyte | Spiked | Recovered | Yield (%) | Limits (%) | RPD (%) |
|---|---|---|---|---|---|---|
| MBLK | 1,1,1-Trichloroethane | ND | | | | |
| MBLK | 1,1,2,2-Tetrachloroethane | ND | | | | |
| MBLK | 1,1,2-Trichloroethane (1,1,2-T | ND | | | | |
| MBLK | 1,1-Dichloroethane | ND | | | | |
| LCS1 | 1,1-Dichloroethylene (1,1DCE) | 4 | 3.74 | 93.5 | ( 57.00 - 154.00 ) | |
| MBLK | 1,1-Dichloroethylene (1,1DCE) | ND | | | | |
| MS | 1,1-Dichloroethylene (1,1DCE) | 4 | 3.85 | 96.2 | ( 57.00 - 154.00 ) | |
| MSD | 1,1-Dichloroethylene (1,1DCE) | 4 | 3.73 | 93.2 | ( 57.00 - 154.00 ) | 3.2 |
| MBLK | 1,2-Dichloroethane | ND | | | | |
| MBLK | 1,2-Dichloropropane | ND | | | | |
| MBLK | 2-Butanone (MEK) | ND | | | | |
| MBLK | 2-Chloroethylvinylether | ND | | | | |
| MBLK | 2-Hexanone | ND | | | | |
| MBLK | 4-Methyl-2-Pentanone (MIBK) | ND | | | | |
| MBLK | Acetone | ND | | | | |
| MBLK | Acrolein | ND | | | | |
| MBLK | Acrylonitrile | ND | | | | |
| LCS1 | Benzene | 4 | 4.14 | 103.5 | ( 75.00 - 124.00 ) | |
| MBLK | Benzene | ND | | | | |
| MS | Benzene | 4 | 4.21 | 105.2 | ( 75.00 - 124.00 ) | |
| MSD | Benzene | 4 | 4.45 | 111.2 | ( 75.00 - 124.00 ) | 5.5 |
| MBLK | Bromoform | ND | | | | |
| MBLK | Carbon Tetrachloride | ND | | | | |
| MBLK | Carbon disulfide | ND | | | | |
| LCS1 | Chlorobenzene | 4 | 4.10 | 102.5 | ( 74.00 - 121.00 ) | |
| MBLK | Chlorobenzene | ND | | | | |
| MS | Chlorobenzene | 4 | 4.24 | 106.0 | ( 74.00 - 121.00 ) | |
| MSD | Chlorobenzene | 4 | 4.49 | 112.2 | ( 74.00 - 121.00 ) | 5.7 |
| MBLK | Chloroethane | ND | | | | |
| MBLK | Chloroform (Trichloromethane) | ND | | | | |
| MBLK | Dibromochloromethane | ND | | | | |
| MBLK | Dichlorobromomethane | ND | | | | |

Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining.
Criteria for MS and DUP are not applicable for ICR monitoring.

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Laboratory
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Guam Water Authority
(continued)

| | | | | | | |
|---|---|---|---|---|---|---|
| MBLK | Dichlorodifluoromethane | ND | | | | |
| MBLK | Ethyl benzene | ND | | | | |
| MBLK | Methyl Bromide | ND | | | | |
| MBLK | Methyl Chloride | ND | | | | |
| MBLK | Methylene Chloride | ND | | | | |
| MBLK | Styrene | ND | | | | |
| MBLK | Tetrachloroethylene (PCE) | ND | | | | |
| MBLK | Tetrahydrofuran | ND | | | | |
| LCS1 | Toluene | 4 | 4.14 | 103.5 | ( 76.00 - 120.00 ) | |
| MBLK | Toluene | ND | | | | |
| MS | Toluene | 4 | 4.21 | 105.2 | ( 76.00 - 120.00 ) | |
| MSD | Toluene | 4 | 4.37 | 109.2 | ( 76.00 - 120.00 ) | 3.7 |
| LCS1 | Trichloroethylene (TCE) | 4 | 4.08 | 102.0 | ( 78.00 - 121.00 ) | |
| MBLK | Trichloroethylene (TCE) | ND | | | | |
| MS | Trichloroethylene (TCE) | 4 | 4.43 | 110.8 | ( 78.00 - 121.00 ) | |
| MSD | Trichloroethylene (TCE) | 4 | 4.45 | 111.2 | ( 78.00 - 121.00 ) | 0.45 |
| MBLK | Trichlorofluoromethane | ND | | | | |
| MBLK | Vinyl Acetate | ND | | | | |
| MBLK | Vinyl Chloride (VC) | ND | | | | |
| MBLK | cis-1,2-Dichloroethene | ND | | | | |
| MBLK | cis-1,3-Dichloropropene | ND | | | | |
| MBLK | m,p-Xylenes | ND | | | | |
| MBLK | m-Dichlorobenzene (1,3-DCB) | ND | | | | |
| MBLK | o-Dichlorobenzene (1,2-DCB) | ND | | | | |
| MBLK | o-Xylene | ND | | | | |
| MBLK | p-Dichlorobenzene (1,4-DCB) | ND | | | | |
| MBLK | trans-1,2-Dichloroethene | ND | | | | |
| MBLK | trans-1,3-Dichloropropene | ND | | | | |

## QC Batch #74822 Cyanide by manual distillation

| QC | Analyte | Spiked | Recovered | Yield (%) | Limits (%) | RPD (%) |
|---|---|---|---|---|---|---|
| LCS1 | Cyanide by manual distillation | 0.05 | 0.050 | 100.0 | ( 80.00 - 120.00 ) | |
| LCS2 | Cyanide by manual distillation | 0.05 | 0.050 | 100.0 | ( 80.00 - 120.00 ) | 0.00 |
| MBLK | Cyanide by manual distillation | ND | | | | |

Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining.
Criteria for MS and DUP are not applicable for ICR monitoring.

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Laboratory
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Guam Water Authority
(continued)

## QC Batch #74999 Pesticides/PCBs

| QC | Analyte | Spiked | Recovered | Yield (%) | Limits (%) | RPD (%) |
|---|---|---|---|---|---|---|
| LCS1 | Aldrin | 0.10 | 0.100 | 100.0 | ( 56.00 - 116.00 ) | |
| LCS2 | Aldrin | 0.10 | 0.095 | 95.0 | ( 56.00 - 116.00 ) | 5.1 |
| MBLK | Aldrin | ND | | | | |
| MS | Aldrin | 0.10 | 0.111 | 111.0 | ( 56.00 - 116.00 ) | |
| MBLK | Alpha-BHC | ND | | | | |
| MBLK | Beta-BHC | ND | | | | |
| MBLK | Chlordane | ND | | | | |
| MBLK | Delta-BHC | ND | | | | |
| LCS1 | Dieldrin | 0.10 | 0.105 | 105.0 | ( 57.00 - 117.00 ) | |
| LCS2 | Dieldrin | 0.10 | 0.101 | 101.0 | ( 57.00 - 117.00 ) | 3.9 |
| MBLK | Dieldrin | ND | | | | |
| MS | Dieldrin | 0.10 | 0.126 | 126.0 | ( 57.00 - 117.00 ) | |
| MBLK | Endosulfan I (alpha) | ND | | | | |
| MBLK | Endosulfan II (beta) | ND | | | | |
| MBLK | Endosulfan sulfate | ND | | | | |
| LCS1 | Endrin | 0.10 | 0.096 | 96.0 | ( 58.00 - 118.00 ) | |
| LCS2 | Endrin | 0.10 | 0.100 | 100.0 | ( 58.00 - 118.00 ) | 4.1 |
| MBLK | Endrin | ND | | | | |
| MS | Endrin | 0.10 | 0.130 | 130.0 | ( 58.00 - 118.00 ) | |
| MBLK | Endrin Aldehyde | ND | | | | |
| LCS1 | Gamma-BHC | 0.10 | 0.106 | 106.0 | ( 59.00 - 119.00 ) | |
| LCS2 | Gamma-BHC | 0.10 | 0.101 | 101.0 | ( 59.00 - 119.00 ) | 4.8 |
| MBLK | Gamma-BHC | ND | | | | |
| MS | Gamma-BHC | 0.10 | 0.118 | 118.0 | ( 59.00 - 119.00 ) | |
| LCS1 | Heptachlor | 0.10 | 0.101 | 101.0 | ( 63.00 - 133.00 ) | |
| LCS2 | Heptachlor | 0.10 | 0.096 | 96.0 | ( 63.00 - 133.00 ) | 5.1 |
| MBLK | Heptachlor | ND | | | | |
| MS | Heptachlor | 0.10 | 0.113 | 113.0 | ( 63.00 - 133.00 ) | |
| MBLK | Heptachlor Epoxide | ND | | | | |
| MBLK | Methoxychlor | ND | | | | |
| MBLK | PCB 1016 Aroclor | ND | | | | |
| MBLK | PCB 1221 Aroclor | ND | | | | |

Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining.
Criteria for MS and DUP are not applicable for ICR monitoring.



ND 1563

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Laboratory
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Guam Water Authority
(continued)

| | | | | | | |
|---|---|---|---|---|---|---|
| MBLK | PCB 1232 Aroclor | ND | | | | |
| MBLK | PCB 1242 Aroclor | ND | | | | |
| MBLK | PCB 1248 Aroclor | ND | | | | |
| MBLK | PCB 1254 Aroclor | ND | | | | |
| MBLK | PCB 1260 Aroclor | ND | | | | |
| MBLK | Toxaphene | ND | | | | |
| MBLK | p,p' DDD | ND | | | | |
| MBLK | p,p' DDE | ND | | | | |
| LCS1 | p,p' DDT | 0.10 | 0.105 | 105.0 | ( 62.00 - 162.00 ) | |
| LCS2 | p,p' DDT | 0.10 | 0.101 | 101.0 | ( 62.00 - 162.00 ) | 3.9 |
| MBLK | p,p' DDT | ND | | | | |
| MS | p,p' DDT | 0.10 | 0.125 | 125.0 | ( 21.00 - 150.00 ) | |

## QC Batch #75332 2,3,7,8-TCDD

| QC | Analyte | Spiked | Recovered | Yield (%) | Limits (%) | RPD (%) |
|---|---|---|---|---|---|---|
| LCS1 | 2,3,7,8-TCDD | 10 | 9.12 | 91.2 | ( 60.00 - 140.00 ) | |
| MBLK | 2,3,7,8-TCDD | ND | | | | |

Spikes which exceed Limits and Method Blanks with positive results are highlighted by Underlining.
Criteria for MS and DUP are not applicable for ICR monitoring.

7

FY2000 DISCHARGE MONITORING REPORTS

ND 1565

PERMITTEE /ADDRESS (Include facility Name.. ..ation if Different)

NATIONAL POLLUTION DISCHARGE ELIMINATION S\.. ..A (NPDES)
DISCHARGE MONITORING REPORT (DMR)

Form Approved.
OMB No. 2040-0004
Approval expires 9-30-85

NAME: Guam Waterworks Authority
ADDRESS: P.O. Box 3010
AGANA, GUAM 96932

FACILITY: Northern District Sewage Treatment Plant
LOCATION: Dededo, Guam

| (2-16) PERMIT NUMBER | (17-19) DISCHARGE NUMBER |
|---|---|
| GU0020141 | 001 |

MONITORING PERIOD

| | YEAR | MO | DAY | | YEAR | MO | DAY |
|---|---|---|---|---|---|---|---|
| FROM | 99 | 10 | 1 | TO | 99 | 10 | 31 |
| | (20-21) | (22-23) | (24-25) | | (26-27) | (28-29) | (30-31) |

NOTE: Read instructions before completing this form.

| PARAMETER (32-37) | | (3 Card only) (46-53) QUANTITY OR LOADING AVERAGE | QUANTITY OR LOADING (54-61) MAXIMUM | UNITS | (4 Card Only) (38-45) QUANTITY OR CONCENTRATION MINIMUM | QUANTITY OR CONCENTRATION (46-53) AVERAGE | QUANTITY OR CONCENTRATION (54-61) MAXIMUM | UNITS | NO. EX. (62-63) | FREQUENCY OF ANALYSIS (64-68) | SAMPLE TYPE (69-70) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FLOW | SAMPLE MEASUREMENT | 5.3 | 7.3 | mgd | | | | mgd | 22 | 31/31 | HOURLY |
| | PERMIT REQUIREMENT | | 8.0 | | | | | | | | CONTINUOUS |
| INFLUENT BOD | SAMPLE MEASUREMENT | 6529 | 11318 | lbs/day | 90 | 141 | 203 | mg/l | | 3/31 | COMPOSITE |
| | PERMIT REQUIREMENT | | | | | | | | | | COMPOSITE |
| EFFLUENT BOD | SAMPLE MEASUREMENT | 4934 | 8493 | lbs/day | 33 | 97 | 152 | mg/l | 2 | 3/31 | COMPOSITE |
| | PERMIT REQUIREMENT | 4256 | 8512 | | | 85 | 170 | | | 1/7 | COMPOSITE |
| INFLUENT SUSPENDED SOLIDS | SAMPLE MEASUREMENT | 7260 | 10090 | lbs/day | 70 | 138 | 181 | mg/l | | 3/31 | COMPOSITE |
| | PERMIT REQUIREMENT | | | | | | | | | | COMPOSITE |
| EFFLUENT SUSPENDED SOLIDS | SAMPLE MEASUREMENT | 2407 | 3353 | lbs/day | 50 | 67 | 92 | mg/l | 1 | 3/31 | COMPOSITE |
| | PERMIT REQUIREMENT | 2504 | 5008 | | | 50 | 100 | | | 1/7 | COMPOSITE |
| EFFLUENT SETTLEABLE SOLIDS | SAMPLE MEASUREMENT | | | | 0.2 | 0.2 | 0.3 | ml/l | 0 | 3/31 | DISCRETE |
| | PERMIT REQUIREMENT | | | | | 1.0 | 2.0 | | | 1/7 | DISCRETE |
| EFFLUENT OIL & GREASE | SAMPLE MEASUREMENT | 1341 | 1341 | lbs/day | 24 | 24 | 24 | mg/l | | 1/31 | DISCRETE |
| | PERMIT REQUIREMENT | | | | | | | | | 1/30 | DISCRETE |
| EFFLUENT pH | SAMPLE MEASUREMENT | | | | 7.1 | 7.1 | 7.2 | | 0 | 3/31 | DISCRETE |
| | PERMIT REQUIREMENT | | | | 7.0 | | 9.0 | | | 1/7 | DISCRETE |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

| NAME/TITLE PRINCIPLE EXECUTIVE OFFICER | | TELEPHONE | | DATE | | |
|---|---|---|---|---|---|---|
| HERBERT J. JOHNSTON Jr.<br>GENERAL MANAGER, GWA<br>ACTING | I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION I BELIEVE THE SUBMITTED INFORMATION IS TRUE ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT SEE 18 USC §1001 AND 33 USC §1319 (Penalties under these statutes may include fines up to $10,000 and or a maximum imprisonment of between 6 months and 5 years) | 671 | 479-7844 | JAN | | |
| TYPED OR PRINTED | SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT | AREA CODE | NUMBER | YEAR | MO | DAY |

COMMENT AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)
Maximum daily flow was exceeded on 22 days this month
Susupended solids monthly average concentration was exceeded by 17 mg/l
BOD monthly average concentration was exceeded by 12 mg/l and average loading by 678 lbs/day.

Explanation of violations attached at end of DMR's

ND 1566

NORTHE STRICT TREATMENT PLANT WASTEWATER RESULTS
FOR THE ...NTH OF OCTOBER 1999

INFLUENT

| DATE | pH | SUSP. SOLIDS mg/l | BOD mg/l | SETTL. SOLID ml/l | SUSP. SOLIDS lbs/day | BOD lbs/day | FLOW mgd |
|---|---|---|---|---|---|---|---|
| 1 | | | | | | | 5.30 |
| 2 | | | | | | | 6.70 |
| 3 | | | | | | | 6.70 |
| 4 | | | | | | | 6.80 |
| 5 | 7.18 | 181 | 203 | 5.0 | 10090 | 11319 | 6.70 |
| 6 | | | | | | | 6.60 |
| 7 | | | | | | | 6.70 |
| 8 | | | | | | | 6.50 |
| 9 | | | | | | | 6.80 |
| 10 | | | | | | | 7.30 |
| 11 | | | | | | | 1.00 |
| 12 | 7.39 | 164 | 90 | 8.0 | 7796 | 1051 | 1.40 |
| 13 | | | | | | | 1.30 |
| 14 | | | | | | | 1.30 |
| 15 | | | | | | | 1.00 |
| 16 | | | | | | | 1.40 |
| 17 | | | | | | | 1.40 |
| 18 | | | | | | | 1.30 |
| 19 | NO ANALYSIS AS SAMPLES WARM | | | | | | 6.70 |
| 20 | | | | | | | 7.00 |
| 21 | | | | | | | 6.80 |
| 22 | | | | | | | 6.80 |
| 23 | | | | | | | 5.60 |
| 24 | | | | | | | 6.40 |
| 25 | | | | | | | 6.60 |
| 26 | 7.43 | 70 | 129 | 5.0 | 3895 | 7217 | 6.70 |
| 27 | | | | | | | 6.60 |
| 28 | | | | | | | 6.80 |
| 29 | | | | | | | 6.60 |
| 30 | | | | | | | 6.50 |
| 31 | | | | | | | 6.70 |
| AVG | 7.33 | 138 | 141 | 6.0 | 7260 | 6529 | 5.26 |
| MIN | 7.18 | 70 | 90 | 5.0 | 3895 | 1051 | 1.00 |
| MAX | 7.43 | 181 | 203 | 8.0 | 10090 | 11319 | 7.30 |

EFFLUENT

| DATE | pH | SUSP. SOLIDS mg/l | BOD mg/l | SETTL. SOLID ml/l | SUSP. SOLIDS lbs/day | BOD lbs/day | SUSP. SOLIDS %removal | BOD %removal | OIL & GREASE mg/l | OIL & GREASE lbs/day |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | 7.15 | 60 | 152 | 0.3 | 3353 | 8493 | 67% | 25% | 24 | 1341 |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |
| 9 | | | | | | | | | | |
| 10 | | | | | | | | | | |
| 11 | | | | | | | | | | |
| 12 | 7.06 | 92 | 33 | 0.2 | 1074 | 385 | 44% | 63% | | |
| 13 | | | | | | | | | | |
| 14 | | | | | | | | | | |
| 15 | | | | | | | | | | |
| 16 | | | | | | | | | | |
| 17 | | | | | | | | | | |
| 18 | | | | | | | | | | |
| 19 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| 21 | | | | | | | | | | |
| 22 | | | | | | | | | | |
| 23 | | | | | | | | | | |
| 24 | | | | | | | | | | |
| 25 | | | | | | | | | | |
| 26 | 7.13 | 60 | 106 | 0.2 | 2794 | 5923 | 28% | 18% | | |
| 27 | | | | | | | | | | |
| 28 | | | | | | | | | | |
| 29 | | | | | | | | | | |
| 30 | | | | | | | | | | |
| 31 | | | | | | | | | | |
| AVG | 7.11 | 67 | 97 | 0.2 | 2407 | 4934 | 46% | 35% | 24 | 1341 |
| MIN | 7.06 | 50 | 33 | 0.2 | 1074 | 385 | 28% | 18% | 24 | 1341 |
| MAX | 7.15 | 92 | 152 | 0.3 | 3353 | 8493 | 67% | 63% | 24 | 1341 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| PERMIT REQUIRMENTS | MAX | monthly avg | 7 | 50 | 85 | 1 | 2504 | 4256 |
| | 6 | daily max | 9 | 100 | 170 | 2 | 5008 | 8512 |

VIOLATIONS
suspended solids monthly average concentration
BOD monthly average concentration and loading.
flow

*Please note that samples were collected but not analyzed for October 20, 1999 as samples were warm when laboratory received them..

** The Southern Link Pump Station was down from the 11th through the 18th.

ND 1567

PERMITTEE NAME/ADDRESS (Include facility Name/Location if Different)

NAME: Guam Waterworks Authority
ADDRESS: P.O. Box 3010
AGANA, GUAM 96932

FACILITY: Northern District Sewage Treatment Plant
LOCATION: Dededo, Guam

# NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES)
## DISCHARGE MONITORING REPORT (DMR)

Form Approved.
OMB No. 2040-0004
Approval expires 9-30-85

(2-16) GU0020141 PERMIT NUMBER

(17-19) 001 DISCHARGE NUMBER

MONITORING PERIOD

| | YEAR | MO | DAY | | YEAR | MO | DAY |
|---|---|---|---|---|---|---|---|
| FROM | 99 | 11 | 1 | TO | 99 | 11 | 30 |
| | (20-21) | (22-23) | (24-25) | | (26-27) | (28-29) | (30-31) |

NOTE: Read instructions before completing this form.

| PARAMETER (32-37) | | (3 Card only) (46-53) AVERAGE | QUANTITY OR LOADING (54-61) MAXIMUM | UNITS | (4 Card Only) (38-45) MINIMUM | QUANTITY OR CONCENTRATION (46-53) AVERAGE | (54-61) MAXIMUM | UNITS | NO. EX. (62-63) | FREQUENCY OF ANALYSIS (64-68) | SAMPLE TYPE (69-70) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FLOW | SAMPLE MEASUREMENT | 2.1 | 7.1 | mgd | | | | mgd | 5 | 30/30 | HOURLY |
| | PERMIT REQUIREMENT | | 6.0 | | | | | | | | CONTINUOUS |
| INFLUENT BOD | SAMPLE MEASUREMENT | 4377 | 9549 | lbs/day | 124 | 149 | 164 | mg/l | | 5/30 | COMPOSITE |
| | PERMIT REQUIREMENT | | | | | | | | | | COMPOSITE |
| EFFLUENT BOD | SAMPLE MEASUREMENT | 1965 | 6305 | lbs/day | 20 | 53 | 108 | mg/l | 0 | 5/30 | COMPOSITE |
| | PERMIT REQUIREMENT | 4258 | 8512 | | | 85 | 170 | | | 1/7 | COMPOSITE |
| INFLUENT SUSPENDED SOLIDS | SAMPLE MEASUREMENT | 5045 | 11798 | lbs/day | 122 | 160 | 208 | mg/l | | 5/30 | COMPOSITE |
| | PERMIT REQUIREMENT | | | | | | | | | | COMPOSITE |
| EFFLUENT SUSPENDED SOLIDS | SAMPLE MEASUREMENT | 2280 | 7373 | lbs/day | 12 | 49 | 130 | mg/l | 2 | 5/30 | COMPOSITE |
| | PERMIT REQUIREMENT | 2504 | 5008 | | | 50 | 100 | | | 1/7 | COMPOSITE |
| EFFLUENT SETTLEABLE SOLIDS | SAMPLE MEASUREMENT | | | | 0 | 0.5 | 1.8 | ml/l | 0 | 5/30 | DISCRETE |
| | PERMIT REQUIREMENT | | | | | 1.0 | 2.0 | | | 1/7 | DISCRETE |
| EFFLUENT OIL & GREASE | SAMPLE MEASUREMENT | 35 | 35 | lbs/day | 5.3 | 5.3 | 5.3 | mg/l | | | DISCRETE |
| | PERMIT REQUIREMENT | | | | | | | | | 1/30 | DISCRETE |
| EFFLUENT pH | SAMPLE MEASUREMENT | | | | 6.9 | 7.3 | 7.8 | | 1 | 5/30 | DISCRETE |
| | PERMIT REQUIREMENT | | | | 7.0 | | 9.0 | | | 1/7 | DISCRETE |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

| NAME/TITLE PRINCIPLE EXECUTIVE OFFICER | | TELEPHONE | | DATE | | |
|---|---|---|---|---|---|---|
| HERBERT J. JOHNSTON Jr.<br>GENERAL MANAGER, GWA<br>ACTING | I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION I BELIEVE THE SUBMITTED INFORMATION IS TRUE ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT SEE. 18 USC §1001 AND 33 USC §1319 (Penalties under these statutes may include fines up to $10,000 and or a maximum imprisonment of between 6 months and 5 years) | 671 | 479-7844 | JAN 2 | | |
| TYPED OR PRINTED | SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT | AREA CODE | NUMBER | YEAR | MO | DAY |

COMMENT AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)
overflow at force main Southern Link from November 3rd to 27th. Flow greater than 6.0 mgd on all other dates
pH was 6.87 on the 2nd
Suspended solids daily maximum concentration was exceeded by 30 mg/l and loading by 2365 lbs/day on the 2nd.

CB 1/21/00

Explanation of violations attached at end of DMR's

ND 1568

NORTHER STRICT TREATMENT PLANT WASTEWATER RESULTS
FOR THE MONTH OF NOVEMBER 1999

INFLUENT

| DATE | pH | SUSP. SOLIDS mg/l | BOD mg/l | SETTL. SOLID ml/l | SUSP. SOLIDS lbs/day | BOD lbs/day | FLOW mgd |
|---|---|---|---|---|---|---|---|
| 1 | | | | | | | 6.80 |
| 2 | 7.02 | 208 | 155 | 9.5 | 11798 | 8785 | 6.80 |
| 3 | | | | | | | 0.80 |
| 4 | | | | | | | 0.90 |
| 5 | | | | | | | 1.00 |
| 6 | | | | | | | 1.00 |
| 7 | | | | | | | 1.00 |
| 8 | | | | | | | 0.90 |
| 9 | 7.49 | 156 | 162 | 9.0 | 1041 | 1081 | 0.80 |
| 10 | | | | | | | 0.90 |
| 11 | | | | | | | 1.20 |
| 12 | | | | | | | 1.30 |
| 13 | | | | | | | 1.30 |
| 14 | | | | | | | 1.10 |
| 15 | | | | | | | 1.20 |
| 16 | 7.35 | 122 | 142 | 9.0 | 1323 | 1540 | 1.30 |
| 17 | | | | | | | 1.20 |
| 18 | | | | | | | 1.30 |
| 19 | | | | | | | 0.80 |
| 20 | | | | | | | 1.10 |
| 21 | | | | | | | 0.90 |
| 22 | | | | | | | 0.00 |
| 23 | 7.30 | 144 | 124 | 7.0 | 1081 | 931 | 0.90 |
| 24 | | | | | | | 1.00 |
| 25 | | | | | | | 0.90 |
| 26 | | | | | | | 1.00 |
| 27 | | | | | | | 4.90 |
| 28 | | | | | | | 6.40 |
| 29 | | | | | | | 7.10 |
| 30 | 7.46 | 171 | 164 | 6.0 | 9981 | 9549 | 7.00 |
| | | | | | | | |
| AVG | 7.32 | 160 | 149 | 8.1 | 5046 | 4377 | 2.09 |
| MIN | 7.02 | 122 | 124 | 6.0 | 1041 | 931 | 0.00 |
| MAX | 7.49 | 208 | 164 | 9.5 | 11798 | 9549 | 7.10 |

EFFLUENT

| DATE | pH | SUSP. SOLIDS mg/l | BOD mg/l | SETTL. SOLID ml/l | SUSP. SOLIDS lbs/day | BOD lbs/day | SUSP. SOLIDS %removal | BOD %removal | OIL & GREASE mg/l | OIL & GREASE lbs/day |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | |
| 2 | 6.87 | 130 | 47 | 1.8 | 7373 | 2665 | 38% | 70% | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |
| 9 | 7.2 | 28 | 43 | 0.0 | 187 | 287 | 82% | 73% | 5.3 | 35 |
| 10 | | | | | | | | | | |
| 11 | | | | | | | | | | |
| 12 | | | | | | | | | | |
| 13 | | | | | | | | | | |
| 14 | | | | | | | | | | |
| 15 | | | | | | | | | | |
| 16 | 7.43 | 12 | 20 | 0.1 | 130 | 217 | 90% | 86% | | |
| 17 | | | | | | | | | | |
| 18 | | | | | | | | | | |
| 19 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| 21 | | | | | | | | | | |
| 22 | | | | | | | | | | |
| 23 | 7.83 | 12 | 47 | 0.3 | 90 | 353 | 92% | 62% | | |
| 24 | | | | | | | | | | |
| 25 | | | | | | | | | | |
| 26 | | | | | | | | | | |
| 27 | | | | | | | | | | |
| 28 | | | | | | | | | | |
| 29 | | | | | | | | | | |
| 30 | 7.31 | 62 | 108 | 0.4 | 3820 | 6305 | 64% | 34% | | |
| | | | | | | | | | | |
| AVG | 7.33 | 49 | 53 | 0.5 | 2280 | 1965 | 73% | 65% | 5.3 | 35 |
| MIN | 6.87 | 12 | 20 | 0.0 | 90 | 217 | 38% | 34% | 5.3 | 35 |
| MAX | 7.83 | 130 | 108 | 1.8 | 7373 | 6305 | 92% | 86% | 5.3 | 35 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| PERMIT REQUIRMENTS | MAX | monthly avg | 7 | 50 | 85 | 1 | 2504 | 4256 |
| | 6 | daily max | 9 | 100 | 170 | 2 | 5008 | 8512 |

VIOLATIONS
suspended solids
pH

* 9 th Pump Station sample grab only due to force main break. Used for BOD and Suspended solids.
* 16 th Pump Station sample grab only due to force main break. Used for BOD and Suspended solids.
* 23 th Pump Station sample not taken due to force main break.

ND 1569

PERMITTEE NAME/ADDRESS (Include facility Name/Location if Different)

NAME: Guam Waterworks Authority
ADDRESS: P.O. Box 3010
AGANA, GUAM 96932

FACILITY: Northern District Sewage Treatment Plant
LOCATION: Dededo, Guam

# NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES)
## DISCHARGE MONITORING REPORT (DMR)

Form Approved.
OMB No. 2040-0004
Approval expires 9-30-85

| (2-16) PERMIT NUMBER | (17-19) DISCHARGE NUMBER |
|---|---|
| GU0020141 | 001 |

| MONITORING PERIOD | YEAR | MO | DAY | | YEAR | MO | DAY |
|---|---|---|---|---|---|---|---|
| FROM | 99 | 12 | 1 | TO | 99 | 12 | 31 |
| | (20-21) | (22-23) | (24-25) | | (26-27) | (28-29) | (30-31) |

NOTE: Read instructions before completing this form.

| PARAMETER (32-37) | | (3 Card only) (46-53) QUANTITY OR LOADING AVERAGE | QUANTITY OR LOADING (54-61) MAXIMUM | UNITS | (4 Card Only) (38-45) QUANTITY OR CONCENTRATION MINIMUM | QUANTITY OR CONCENTRATION (46-53) AVERAGE | QUANTITY OR CONCENTRATION (54-61) MAXIMUM | UNITS | NO. EX. (62-63) | FREQUENCY OF ANALYSIS (64-68) | SAMPLE TYPE (69-70) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FLOW | SAMPLE MEASUREMENT | 4.3 | 7.2 | mgd | | | | mgd | 17 | 31/31 | HOURLY |
| | PERMIT REQUIREMENT | | 6.0 | | | | | | | | CONTINUOUS |
| INFLUENT BOD | SAMPLE MEASUREMENT | 4351 | 9161 | lbs/day | 157 | 163 | 175 | mg/l | | 3/31 | COMPOSITE |
| | PERMIT REQUIREMENT | | | | | | | | | | COMPOSITE |
| EFFLUENT BOD | SAMPLE MEASUREMENT | 3206 | 8290 | lbs/day | 55 | 85 | 142 | mg/l | 0 | 3/31 | COMPOSITE |
| | PERMIT REQUIREMENT | 4256 | 8512 | | | 85 | 170 | | | 1/7 | COMPOSITE |
| INFLUENT SUSPENDED SOLIDS | SAMPLE MEASUREMENT | 7574 | 18023 | lbs/day | 126 | 187 | 309 | mg/l | | 4/31 | COMPOSITE |
| | PERMIT REQUIREMENT | | | | | | | | | | COMPOSITE |
| EFFLUENT SUSPENDED SOLIDS | SAMPLE MEASUREMENT | 3428 | 6889 | lbs/day | 34 | 74 | 118 | mg/l | 2 | 4/31 | COMPOSITE |
| | PERMIT REQUIREMENT | 2504 | 5008 | | | 50 | 100 | | | 1/7 | COMPOSITE |
| EFFLUENT SETTLEABLE SOLIDS | SAMPLE MEASUREMENT | | | | 0 | 0.2 | 0.4 | ml/l | 0 | 4/31 | DISCRETE |
| | PERMIT REQUIREMENT | | | | | 1.0 | 2.0 | | | 1/7 | DISCRETE |
| EFFLUENT OIL & GREASE | SAMPLE MEASUREMENT | 130 | 130 | lbs/day | 13 | 13 | 13 | mg/l | | 1/31 | DISCRETE |
| | PERMIT REQUIREMENT | | | | | | | | | 1/30 | DISCRETE |
| EFFLUENT pH | SAMPLE MEASUREMENT | | | | 7.0 | 7.2 | 7.5 | | 0 | 4/31 | DISCRETE |
| | PERMIT REQUIREMENT | | | | 7.0 | | 9.0 | | | 1/7 | DISCRETE |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

| NAME/TITLE PRINCIPLE EXECUTIVE OFFICER | | TELEPHONE | | DATE | | |
|---|---|---|---|---|---|---|
| HERBERT J. JOHNSTON Jr.<br>GENERAL MANAGER, GWA<br>ACTING | I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION I BELIEVE THE SUBMITTED INFORMATION IS TRUE ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT SEE. 18 USC §1001 AND 33 USC §1319 (Penalties under these statutes may include fines up to $10,000 and or a maximum imprisonment of between 6 months and 5 years) | 671 | 479-7844 | JAN 10 | | |
| TYPED OR PRINTED | SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT | AREA CODE | NUMBER | YEAR | MO | DAY |

COMMENT AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)
Flow was greater than 6.0 mgd 16 days this month
Suspended solids monthly average concentration was exceeded by 24 mg/l. Daily maximum concentration was exceeded by 18 mg/l on the 21st and maximum loading by 1881 lbs/day on the 21st and 947 lbs/day on the 28th.

1/11/10

Explanation of violations attached at end of DMR's

ND 1570

NORTHERN DI[illegible]CT TREATMENT PLANT WASTEWATER RESULTS
FOR THE MON[illegible]F DECEMBER 1999

INFLUENT

| DATE | pH | SUSP. SOLIDS mg/l | BOD mg/l | SETTL. SOLID ml/l | SUSP. SOLIDS lbs/day | BOD lbs/day | FLOW mgd |
|---|---|---|---|---|---|---|---|
| 1 | | | | | | | 6.80 |
| 2 | | | | | | | 7.00 |
| 3 | | | | | | | 6.70 |
| 4 | | | | | | | 1.00 |
| 5 | | | | | | | 1.20 |
| 6 | 7.41 | 160 | 175 | 9.5 | 2002 | 2189 | 1.50 |
| 7 | | | | | | | 1.40 |
| 8 | | | | | | | 1.30 |
| 9 | | | | | | | 1.30 |
| 10 | | | | | | | 1.60 |
| 11 | | | | | | | 1.50 |
| 12 | | | | | | | 1.30 |
| 13 | | | | | | | 1.20 |
| 14 | 7.53 | 126 | 157 | 5.0 | 1366 | 1702 | 1.30 |
| 15 | | | | | | | 1.40 |
| 16 | | | | | | | 1.80 |
| 17 | | | | | | | 1.20 |
| 18 | | | | | | | 1.20 |
| 19 | | | | | | | 6.90 |
| 20 | | | | | | | 6.90 |
| 21 | 7.44 | 153 | 157 | 9.0 | 8907 | 9161 | 7.00 |
| 22 | | | | | | | 7.80 |
| 23 | | | | | | | 7.10 |
| 24 | | | | | | | 7.20 |
| 25 | | | | | | | 7.00 |
| 26 | | | | | | | 7.10 |
| 27 | | | | | | | 6.90 |
| 28 | 7.25 | 309 | | 8.0 | 18023 | | 7.00 |
| 29 | | | | | | | 7.00 |
| 30 | | | | | | | 7.20 |
| 31 | | | | | | | 7.10 |
| AVG | 7.41 | 187 | 163 | 7.9 | 7574 | 4351 | 4.26 |
| MIN | 7.25 | 126 | 157 | 5.0 | 1366 | 1702 | 1.00 |
| MAX | 7.53 | 309 | 175 | 9.5 | 18023 | 9161 | 7.20 |

EFFLUENT

| DATE | pH | SUSP. SOLIDS mg/l | BOD mg/l | SETTL. SOLID ml/l | SUSP. SOLIDS lbs/day | BOD lbs/day | SUSP. SOLIDS %removal | BOD %removal | OIL & GREASE mg/l | OIL & GREASE lbs/day |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| 6 | 7.26 | 40 | 55 | 0.0 | 500 | 688 | 75% | 69% | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |
| 9 | | | | | | | | | | |
| 10 | | | | | | | | | | |
| 11 | | | | | | | | | | |
| 12 | | | | | | | | | | |
| 13 | | | | | | | | | 13 | 130 |
| 14 | 7.47 | 34 | 59 | 0.0 | 369 | 640 | 73% | 62% | | |
| 15 | | | | | | | | | | |
| 16 | | | | | | | | | | |
| 17 | | | | | | | | | | |
| 18 | | | | | | | | | | |
| 19 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| 21 | 7.05 | 118 | 142 | 0.2 | 6889 | 8290 | 23% | 10% | | |
| 22 | | | | | | | | | | |
| 23 | | | | | | | | | | |
| 24 | | | | | | | | | | |
| 25 | | | | | | | | | | |
| 26 | | | | | | | | | | |
| 27 | | | | | | | | | | |
| 28 | 7.02 | 102 | | 0.4 | 5955 | | 67% | | | |
| 29 | | | | | | | | | | |
| 30 | | | | | | | | | | |
| 31 | | | | | | | | | | |
| AVG | 7.20 | 74 | 85 | 0.2 | 3428 | 3206 | 59% | 47% | 13 | 130 |
| MIN | 7.02 | 34 | 55 | 0.0 | 369 | 640 | 23% | 10% | 13 | 130 |
| MAX | 7.47 | 118 | 142 | 0.4 | 6889 | 8290 | 75% | 69% | 13 | 130 |

| PERMIT REQUIRMENTS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| MAX | monthly avg | 7 | 50 | 85 | 1 | 2504 | 4256 |
| 6 | daily max | 9 | 100 | 170 | 2 | 5008 | 8512 |

VIOLATIONS
suspended solids
* 6 th No Pump Station sample
* 14 th No Pump Station sample
* 28 th samples not kept cold, no BOD analyzed

ND 1571

PERMITTEE NAME/ADDRESS (Include facility Name/Location if Different)

NAME: Guam Waterworks Authority
ADDRESS: P.O. Box 3010
AGANA, GUAM 96932

FACILITY: Northern District Sewage Treatment Plant
LOCATION: Dededo, Guam

# NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES)
## DISCHARGE MONITORING REPORT (DMR)

Form Approved.
OMB No. 2040-0004
Approval expires 9-30-85

| (2-16) | (17-19) |
|---|---|
| GU0020141 | 001 |
| PERMIT NUMBER | DISCHARGE NUMBER |

| MONITORING PERIOD | YEAR | MO | DAY | | YEAR | MO | DAY |
|---|---|---|---|---|---|---|---|
| FROM | 2000 | 1 | 1 | TO | 2000 | 1 | 31 |
| | (20-21) | (22-23) | (24-25) | | (26-27) | (28-29) | (30-31) |

NOTE: Read instructions before completing this form.

| PARAMETER (32-37) | | (3 Card only) (46-53) AVERAGE | QUANTITY OR LOADING (54-61) MAXIMUM | UNITS | (4 Card Only) (38-45) MINIMUM | QUANTITY OR CONCENTRATION (46-53) AVERAGE | (54-61) MAXIMUM | UNITS | NO. EX. (62-63) | FREQUENCY OF ANALYSIS (64-68) | SAMPLE TYPE (69-70) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FLOW | SAMPLE MEASUREMENT | 6.6 | 7.6 | mgd | | | | mgd | 31 | 31/31 | HOURLY |
| | PERMIT REQUIREMENT | | 6.0 | | | | 6.0 | | | | CONTINUOUS |
| INFLUENT BOD | SAMPLE MEASUREMENT | 10790 | 11970 | lbs/day | 169 | 187 | 221 | mg/l | | 4/31 | COMPOSITE |
| | PERMIT REQUIREMENT | | | | | | | | | | COMPOSITE |
| EFFLUENT BOD | SAMPLE MEASUREMENT | 10473 | 13914 | lbs/day | 110 | 184 | 249 | mg/l | 7 | 4/31 | COMPOSITE |
| | PERMIT REQUIREMENT | 4250 | 8512 | | | 85 | 170 | | | 1/7 | COMPOSITE |
| INFLUENT SUSPENDED SOLIDS | SAMPLE MEASUREMENT | 11689 | 14705 | lbs/day | 151 | 205 | 271 | mg/l | | 4/31 | COMPOSITE |
| | PERMIT REQUIREMENT | 4760 | | | | | | | | | COMPOSITE |
| EFFLUENT SUSPENDED SOLIDS | SAMPLE MEASUREMENT | 12624 | 18775 | lbs/day | 114 | 224 | 336 | mg/l | 10 | 4/31 | COMPOSITE |
| | PERMIT REQUIREMENT | 2504 | 5008 | | | 50 | 100 | | | 1/7 | COMPOSITE |
| EFFLUENT SETTLEABLE SOLIDS | SAMPLE MEASUREMENT | | | | 0.3 | 2.2 | 6.0 | ml/l | 2 | 4/31 | DISCRETE |
| | PERMIT REQUIREMENT | | | | | 0.5 | 2.0 | | | 1/7 | DISCRETE |
| EFFLUENT OIL & GREASE | SAMPLE MEASUREMENT | 907 | 907 | lbs/day | 16 | 16 | 16 | mg/l | | 1/31 | DISCRETE |
| | PERMIT REQUIREMENT | | | | | | | | | 1/30 | DISCRETE |
| EFFLUENT pH | SAMPLE MEASUREMENT | | | | 7.0 | 7.2 | 7.4 | | 0 | 4/31 | DISCRETE |
| | PERMIT REQUIREMENT | | | | 6.0 | | 9.0 | | | 1/7 | DISCRETE |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

| NAME/TITLE PRINCIPLE EXECUTIVE OFFICER | | TELEPHONE | | DATE | | |
|---|---|---|---|---|---|---|
| HERBERT J. JOHNSTON Jr.<br>GENERAL MANAGER, GWA<br>ACTING | I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION I BELIEVE THE SUBMITTED INFORMATION IS TRUE ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT SEE. 18 USC §1001 AND 33 USC §1319 (Penalties under these statutes may include fines up to $10,000 and or a maximum imprisonment of between 6 months and 5 years) | 671 | 479-7844 | MAY | 05 | 2000 |
| TYPED OR PRINTED | SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT | AREA CODE | NUMBER | YEAR | MO | DAY |

COMMENT AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

The daily flow was above the allowable maximum of 6 mgd on all dates this month.

BOD monthly average concentration was exceeded by 99 mg/l, and the monthly average loading by 6217 lbs/day. The daily maximum concentration was exceeded on 2 of the 4 sample dates, and daily maximum loading on 3 of the 4 samlpe dates.

Suspended solids monthly average concentration was exceeded by 174 mg/l, and the monthly average loading by 10120 lbs/day. The daily maximum concentration and loading was exceeded for all 4 sample dates,

Settleable solids monthly average was exceeded by 1.2 ml/L, and the maximum daily allowable was exceeded on 1 of 4 sample dates.

Explanation of violations attached at end of DMR's

5/5/00

ND 1572

NORTHERN DISTRICT TREATMENT PLANT WASTEWATER RESULTS
FOR THE MONTH OF JANUARY 2000

INFLUENT

| DATE | pH | SUSP. SOLIDS mg/l | BOD mg/l | SETTL. SOLID ml/l | SUSP. SOLIDS lbs/day | BOD lbs/day | FLOW mgd |
|---|---|---|---|---|---|---|---|
| 1 | | | | | | | 6.50 |
| 2 | | | | | | | 6.50 |
| 3 | | | | | | | 6.60 |
| 4 | | | | | | | 6.50 |
| 5 | 7.54 | 151 | 185 | 7.5 | 9548 | 11721 | 7.60 |
| 6 | | | | | | | 6.30 |
| 7 | | | | | | | 6.80 |
| 8 | | | | | | | 6.60 |
| 9 | | | | | | | 6.60 |
| 10 | | | | | | | 6.20 |
| 11 | | | | | | | 6.30 |
| 12 | 7.36 | 271 | 221 | 8.4 | 14705 | 11970 | 6.50 |
| 13 | | | | | | | 6.50 |
| 14 | | | | | | | 6.40 |
| 15 | | | | | | | 6.40 |
| 16 | | | | | | | 6.80 |
| 17 | | | | | | | 6.70 |
| 18 | | | | | | | 6.60 |
| 19 | 7.31 | 201 | 175 | 9.0 | 11216 | 9758 | 6.70 |
| 20 | | | | | | | 6.50 |
| 21 | | | | | | | 6.60 |
| 22 | | | | | | | 6.70 |
| 23 | | | | | | | 6.70 |
| 24 | | | | | | | 6.50 |
| 25 | | | | | | | 6.80 |
| 26 | 7.73 | 196 | 169 | 4.0 | 11286 | 9712 | 6.90 |
| 27 | | | | | | | 6.70 |
| 28 | | | | | | | 6.80 |
| 29 | | | | | | | 6.80 |
| 30 | | | | | | | 6.90 |
| 31 | | | | | | | 6.80 |
| AVG | 7.49 | 205 | 187 | 7.2 | 11689 | 10790 | 6.63 |
| MIN | 7.31 | 151 | 169 | 4.0 | 9548 | 9712 | 6.20 |
| MAX | 7.73 | 271 | 221 | 9.0 | 14705 | 11970 | 7.60 |

EFFLUENT

| DATE | pH | SUSP. SOLIDS mg/l | BOD mg/l | SETTL. SOLID ml/l | SUSP. SOLIDS lbs/day | BOD lbs/day | SUSP. SOLIDS %removal | BOD %remova | OIL & GREASE mg/l | OIL & GREASE lbs/day |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | 7.14 | 114 | 110 | 0.3 | 7226 | 6972 | 24% | 41% | | |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | 16 | 907 |
| 8 | | | | | | | | | | |
| 9 | | | | | | | | | | |
| 10 | | | | | | | | | | |
| 11 | | | | | | | | | | |
| 12 | 7.01 | 316 | 207 | 0.7 | 17130 | 11221 | -16% | 6% | | |
| 13 | | | | | | | | | | |
| 14 | | | | | | | | | | |
| 15 | | | | | | | | | | |
| 16 | | | | | | | | | | |
| 17 | | | | | | | | | | |
| 18 | | | | | | | | | | |
| 19 | 7.31 | 336 | 249 | 6.0 | 18775 | 13914 | -67% | -43% | | |
| 20 | | | | | | | | | | |
| 21 | | | | | | | | | | |
| 22 | | | | | | | | | | |
| 23 | | | | | | | | | | |
| 24 | | | | | | | | | | |
| 25 | | | | | | | | | | |
| 26 | 7.37 | 128 | 170 | 1.9 | 8366 | 9783 | 35% | -1% | | |
| 27 | | | | | | | | | | |
| 28 | | | | | | | | | | |
| 29 | | | | | | | | | | |
| 30 | | | | | | | | | | |
| 31 | | | | | | | | | | |
| AVG | 7.21 | 222 | 184 | 2.5 | 12624 | 10476 | -6% | 1% | 16 | 907 |
| MIN | 7.01 | 114 | 110 | 0.3 | 7226 | 6972 | -67% | -43% | 16 | 907 |
| MAX | 7.37 | 336 | 249 | 6.0 | 18775 | 13914 | 35% | 41% | 16 | 907 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| PERMIT REQUIRMENTS | MAX | monthly avg | 7 | 50 | 85 | 1 | 2504 | 4256 |
| | 6 | daily max | 9 | 100 | 170 | 2 | 5008 | 8512 |

VIOLATIONS
BOD
SUSPENDED SOLIDS
SETTLEABLE SOLIDS

FLOW

PERMITTEE NAME/ADDRESS (Include facility Name/Location if Different)

NAME: Guam Waterworks Authority
ADDRESS: P.O. Box 3010
AGANA, GUAM 96932

FACILITY: Northern District Sewage Treatment Plant
LOCATION: Dededo, Guam

NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES)
DISCHARGE MONITORING REPORT (DMR)

Form Approved.
OMB No. 2040-0004
Approval expires 9-30-85

| (2-16) | (17-19) |
|---|---|
| GU0020141 | 001 |
| PERMIT NUMBER | DISCHARGE NUMBER |

| MONITORING PERIOD | YEAR | MO | DAY | | YEAR | MO | DAY |
|---|---|---|---|---|---|---|---|
| FROM | 2000 | 2 | 1 | TO | 2000 | 2 | 29 |
| | (20-21) | (22-23) | (24-25) | | (26-27) | (28-29) | (30-31) |

NOTE: Read instructions before completing this form.

| PARAMETER (32-37) | | (3 Card only) (46-53) QUANTITY OR LOADING (54-61) AVERAGE | MAXIMUM | UNITS | (4 Card Only) (38-45) QUANTITY OR CONCENTRATION (46-53) MINIMUM | AVERAGE | (54-61) MAXIMUM | UNITS | NO. EX. (62-63) | FREQUENCY OF ANALYSIS (64-68) | SAMPLE TYPE (69-70) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FLOW | SAMPLE MEASUREMENT | 7.1 | 9.4 | mgd | | | | mgd | 29 | 29/29 | HOURLY |
| | PERMIT REQUIREMENT | | 6.0 | | | | | | | | CONTINUOUS |
| INFLUENT BOD | SAMPLE MEASUREMENT | 7812 | 8194 | lbs/day | 112 | 129 | 144 | mg/l | | 3/29 | COMPOSITE |
| | PERMIT REQUIREMENT | | | | | | | | | | COMPOSITE |
| EFFLUENT BOD | SAMPLE MEASUREMENT | 9001 | 9868 | lbs/day | 128 | 149 | 174 | mg/l | 5 | 3/29 | COMPOSITE |
| | PERMIT REQUIREMENT | 4256 | 8512 | | | 85 | 170 | | | 1/7 | COMPOSITE |
| INFLUENT SUSPENDED SOLIDS | SAMPLE MEASUREMENT | 7093 | 9127 | lbs/day | 93 | 118 | 161 | mg/l | | 3/29 | COMPOSITE |
| | PERMIT REQUIREMENT | | | | | | | | | | COMPOSITE |
| EFFLUENT SUSPENDED SOLIDS | SAMPLE MEASUREMENT | 8397 | 12043 | lbs/day | 76 | 138 | 190 | mg/l | 6 | 3/29 | COMPOSITE |
| | PERMIT REQUIREMENT | 2504 | 5008 | | | 50 | 100 | | | 1/7 | COMPOSITE |
| EFFLUENT SETTLEABLE SOLIDS | SAMPLE MEASUREMENT | | | | 1.1 | 2.0 | 3.0 | ml/l | 2 | 3/29 | DISCRETE |
| | PERMIT REQUIREMENT | | | | | 1.0 | 2.0 | | | 1/7 | DISCRETE |
| EFFLUENT OIL & GREASE | SAMPLE MEASUREMENT | 1531 | 1531 | lbs/day | 27 | 27 | 27 | mg/l | | 1/29 | DISCRETE |
| | PERMIT REQUIREMENT | | | | | | | | | 1/30 | DISCRETE |
| EFFLUENT pH | SAMPLE MEASUREMENT | | | | 7.2 | 7.2 | 7.3 | | 0 | 4/29 | DISCRETE |
| | PERMIT REQUIREMENT | | | | 7.0 | | 9.0 | | | 1/7 | DISCRETE |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

| NAME/TITLE PRINCIPLE EXECUTIVE OFFICER | | | TELEPHONE | | DATE | | |
|---|---|---|---|---|---|---|---|
| HERBERT J. JOHNSTON Jr.<br>GENERAL MANAGER, GWA<br>ACTING | I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION I BELIEVE THE SUBMITTED INFORMATION IS TRUE ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT SEE. 18 USC $1001 AND 33 USC $1319 (Penalties under these statutes may include fines up to $10,000 and or a maximum imprisonment of between 6 months and 5 years) | | 671 | 479-7844 | MAY 05 2000 | | |
| TYPED OR PRINTED | | SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT | AREA CODE | NUMBER | YEAR | MO | DAY |

COMMENT AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

The daily flow was above the allowable maximum of 6 mgd on all dates this month.

BOD monthly average concentration was exceeded by 64 mg/l, and the monthly average loading by 4745 lbs/day. The daily maximum concentration was exceeded on 1 of the 3 sample dates, and daily maximum loading on 2 of the 3 sample dates.

Suspended solids monthly average concentration was exceeded by 88 mg/l, and the monthly average loading by 5893 lbs/day. The daily maximum concentration was exceeded all 2 of 3 sample dates, and daily maximum loading on 2 of the 3 sample dates.

Settleable solids monthly average was exceeded by 1.0 ml/L, and the maximum daily allowable was exceeded on 1 of 3 sample dates.

Explanation of violations attached at end of DMR's

5/5/00

ND 1573

NORTHERN DISTRICT TREATMENT PLANT WASTEWATER RESULTS
FOR THE MONTH OF FEBRUARY 2000

INFLUENT

| DATE | pH | SUSP. SOLIDS mg/l | BOD mg/l | SETTLE. SOLID ml/l | SUSP. SOLIDS lbs/day | BOD lbs/day | FLOW mgd |
|---|---|---|---|---|---|---|---|
| 1 | | | | | | | 6.60 |
| 2 | 7.54 | 161 | 144 | 23.0 | 9127 | 8176 | 6.80 |
| 3 | | | | | | | 7.00 |
| 4 | | | | | | | 6.70 |
| 5 | | | | | | | 6.60 |
| 6 | | | | | | | 6.80 |
| 7 | | | | | | | 6.70 |
| 8 | | | | | | | 7.30 |
| 9 | NO SAMPLES DELIVERED TO LAB | | | | | | 6.30 |
| 10 | | | | | | | 7.50 |
| 11 | | | | | | | 7.20 |
| 12 | | | | | | | 9.30 |
| 13 | | | | | | | 8.40 |
| 14 | | | | | | | 6.40 |
| 15 | | | | | | | 5.90 |
| 16 | 7.47 | 100 | 112 | 6.0 | 6343 | 7067 | 7.60 |
| 17 | | | | | | | 7.30 |
| 18 | | | | | | | 6.80 |
| 19 | | | | | | | 6.80 |
| 20 | | | | | | | 7.20 |
| 21 | | | | | | | 7.80 |
| 22 | | | | | | | 8.00 |
| 23 | 7.50 | 93 | 131 | 5.0 | 5810 | 8194 | 7.50 |
| 24 | | | | | | | 7.40 |
| 25 | | | | | | | 7.70 |
| 26 | | | | | | | 7.80 |
| 27 | | | | | | | 7.50 |
| 28 | | | | | | | 7.40 |
| 29 | | | | | | | 0.00 |
| | | | | | | | |
| | | | | | | | |
| AVG | 7.50 | 118 | 129 | 11.3 | 7093 | 7812 | 7.13 |
| MIN | 7.47 | 93 | 112 | 5.0 | 5810 | 7067 | 0.00 |
| MAX | 7.54 | 161 | 144 | 23.0 | 9127 | 8194 | 9.40 |

EFFLUENT

| DATE | pH | SUSP. SOLIDS mg/l | BOD mg/l | SETTLE. SOLID ml/l | SUSP. SOLIDS lbs/day | BOD lbs/day | SUSP. SOLIDS %removal | BOD %remova | OIL & GREASE mg/l | OIL & GREASE lbs/day |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | |
| 2 | 7.23 | 148 | 174 | 1.1 | 8393 | 9864 | 8% | -21% | 27 | 1531 |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |
| 9 | NO SAMPLES DELIVERED TO LAB | | | | | | | | | |
| 10 | | | | | | | | | | |
| 11 | | | | | | | | | | |
| 12 | | | | | | | | | | |
| 13 | | | | | | | | | | |
| 14 | | | | | | | | | | |
| 15 | | | | | | | | | | |
| 16 | 7.27 | 100 | 144 | 3.0 | 12043 | 9127 | -90% | -29% | | |
| 17 | | | | | | | | | | |
| 18 | | | | | | | | | | |
| 19 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| 21 | | | | | | | | | | |
| 22 | | | | | | | | | | |
| 23 | 7.23 | 76 | 128 | 2.0 | 4754 | 8006 | 18% | 2% | | |
| 24 | | | | | | | | | | |
| 25 | | | | | | | | | | |
| 26 | | | | | | | | | | |
| 27 | | | | | | | | | | |
| 28 | | | | | | | | | | |
| 29 | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| AVG | 7.24 | 108 | 149 | 2.0 | 8397 | 9001 | -21% | -16% | 27 | 1531 |
| MIN | 7.23 | 76 | 128 | 1.1 | 4754 | 8006 | -90% | -29% | 27 | 1531 |
| MAX | 7.27 | 148 | 174 | 3.0 | 12043 | 9864 | 18% | 2% | 27 | 1531 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| PERMIT REQUIREMENTS | MAX monthly avg | 7 | 50 | 85 | 1 | 2504 | 4256 |
| | 6 daily max | 9 | 100 | 170 | 2 | 5008 | 8512 |

VIOLATIONS
BOD
SUSPENDED SOLIDS
SETTLEABLE SOLIDS

ND 1574

:TTEE NAME/ADDRESS (Include
fa...y Name/Location if Different)

NAME: Guam Waterworks Authority
ADDRESS: P.O. Box 3010
AGANA, GUAM 96932

FACILITY: Northern District Sewage Treatment Plant
LOCATION: Dededo, Guam

NATIONAL POLLUTION DISCHARGE ELIMINAT. :STEM (NPDES)
DISCHARGE MONITORING REPORT (DMR)

Form Approved.
OMB No. 2040-0004
Approval expires 9-30-85

(2-16) GU0020141 PERMIT NUMBER

(17-19) 001 DISCHARGE NUMBER

MONITORING PERIOD

| | YEAR | MO | DAY | | YEAR | MO | DAY |
|---|---|---|---|---|---|---|---|
| FROM | 2000 | 3 | 1 | TO | 2000 | 3 | 31 |
| | (20-21) | (22-23) | (24-25) | | (26-27) | (28-29) | (30-31) |

NOTE: Read instructions before completing this form.

| PARAMETER (32-37) | | (3 Card only) (46-53) QUANTITY OR LOADING (54-61) AVERAGE | MAXIMUM | UNITS | (4 Card Only) (38-45) QUANTITY OR CONCENTRATION (46-53) MINIMUM | AVERAGE | (54-61) MAXIMUM | UNITS | NO. EX. (62-63) | FREQUENCY OF ANALYSIS (64-68) | SAMPLE TYPE (69-70) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FLOW | SAMPLE MEASUREMENT | 7.3 | 9.0 | mgd | | | | mgd | 31 | 31/31 | HOURLY |
| | PERMIT REQUIREMENT | | 6.0 | | | | | | | | CONTINUOUS |
| INFLUENT BOD | SAMPLE MEASUREMENT | 8170 | 9158 | lbs/day | 123 | 135 | 144 | mg/l | | 4/31 | COMPOSITE |
| | PERMIT REQUIREMENT | | | | | | | | | | COMPOSITE |
| EFFLUENT BOD | SAMPLE MEASUREMENT | 8356 | 10146 | lbs/day | 109 | 137 | 154 | mg/l | 7 | 4/31 | COMPOSITE |
| | PERMIT REQUIREMENT | 4256 | 8517 | | | 85 | 170 | | | 1/7 | COMPOSITE |
| INFLUENT SUSPENDED SOLIDS | SAMPLE MEASUREMENT | 6392 | 7910 | lbs/day | 91 | 106 | 128 | mg/l | | 4/31 | COMPOSITE |
| | PERMIT REQUIREMENT | | | | | | | | | | COMPOSITE |
| EFFLUENT SUSPENDED SOLIDS | SAMPLE MEASUREMENT | 7934 | 9875 | lbs/day | 82 | 129 | 160 | mg/l | 10 | 4/31 | COMPOSITE |
| | PERMIT REQUIREMENT | 2504 | 5008 | | | 50 | 100 | | | 1/7 | COMPOSITE |
| EFFLUENT SETTLEABLE SOLIDS | SAMPLE MEASUREMENT | | | | 0.2 | 1.5 | 4.0 | ml/l | 2 | 4/31 | DISCRETE |
| | PERMIT REQUIREMENT | | | | | 1.0 | 2.0 | | | 1/7 | DISCRETE |
| EFFLUENT OIL & GREASE | SAMPLE MEASUREMENT | 1351 | 1351 | lbs/day | 18 | 18 | 18 | mg/l | | 1/31 | DISCRETE |
| | PERMIT REQUIREMENT | | | | | | | | | 1/30 | DISCRETE |
| EFFLUENT pH | SAMPLE MEASUREMENT | | | | 7.3 | 7.4 | 7.5 | | 0 | 4/31 | DISCRETE |
| | PERMIT REQUIREMENT | | | | 7.0 | | 9.0 | | | 1/7 | DISCRETE |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

NAME/TITLE PRINCIPLE EXECUTIVE OFFICER

HERBERT J. JOHNSTON Jr.

GENERAL MANAGER, GWA
ACTING

TYPED OR PRINTED

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION I BELIEVE THE SUBMITTED INFORMATION IS TRUE ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT SEE. 18 USC $1001 AND 33 USC $1319 (Penalties under these statutes may include fines up to $10,000 and or a maximum imprisonment of between 6 months and 5 years)

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

| TELEPHONE | | DATE | | |
|---|---|---|---|---|
| AREA CODE | NUMBER | YEAR | MO | DAY |
| 671 | 479-7844 | MAY | 05 | 2000 |

COMMENT AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

The daily flow was above the allowable maximum of 6 mgd on all dates this month.

BOD monthly average concentration was exceeded by 99 mg/l, and the monthly average loading by 6217 lbs/day. The daily maximum concentration was exceeded on 2 of the 4 sample dates, and daily maximum loading on 3 of the 4 samlpe dates.

Suspended solids monthly average concentration was exceeded by 174 mg/l, and the monthly average loading by 10120 lbs/day. The daily maximum concentration and loading was exceeded for all 4 sample dates,

Settleable solids monthly average was exceeded by 1.2 ml/L, and the maximum daily allowable was exceeded on 1 of 4 sample dates.

Explanation of violations attached at end of DMR's

5/5/0

ND 1575

NORTHERN DISTRICT TREATMENT PLANT WASTEWATER RESULTS
FOR THE MONTH OF JANUARY 2000

INFLUENT

| DATE | pH | SUSP. SOLIDS mg/l | BOD mg/l | SETTL. SOLID ml/l | SUSP. SOLIDS lbs/day | BOD lbs/day | FLOW mgd |
|---|---|---|---|---|---|---|---|
| 1 | 7.42 | | | 6.0 | | | 8.00 |
| 2 | | | | | | | 8.00 |
| 3 | | | | | | | 8.20 |
| 4 | | | | | | | 6.80 |
| 5 | | | | | | | 8.90 |
| 6 | | | | | | | 6.80 |
| 7 | | | | | | | 8.30 |
| 8 | 7.46 | 98 | 139 | 10.0 | 6484 | 9158 | 7.80 |
| 9 | | | | | | | 8.30 |
| 10 | | | | | | | 7.60 |
| 11 | | | | | | | 6.70 |
| 12 | | | | | | | 6.60 |
| 13 | | | | | | | 7.40 |
| 14 | | | | | | | 8.30 |
| 15 | 7.56 | 128 | 144 | 5.0 | 7910 | 8871 | 7.40 |
| 16 | | | | | | | 7.40 |
| 17 | | | | | | | 6.80 |
| 18 | | | | | | | 8.60 |
| 19 | | | | | | | 8.60 |
| 20 | | | | | | | 6.90 |
| 21 | | | | | | | 6.80 |
| 22 | 7.7 | 91 | 123 | 5.0 | 4784 | 6479 | 6.30 |
| 23 | | | | | | | 6.90 |
| 24 | | | | | | | 7.00 |
| 25 | | | | | | | 6.80 |
| 26 | | | | | | | 6.80 |
| 27 | | | | | | | 6.80 |
| 28 | | | | | | | 6.60 |
| 29 | | | | | | | 6.80 |
| 30 | | | | | | | 6.80 |
| 31 | | | | | | | 7.0 |
| AVG | 7.54 | 106 | 135 | 6.5 | 6392 | 8170 | 7.30 |
| MIN | 7.42 | 91 | 123 | 5.0 | 4784 | 6479 | 6.30 |
| MAX | 7.7 | 128 | 144 | 10.0 | 7910 | 9158 | 8.90 |

EFFLUENT

| DATE | pH | SUSP. SOLIDS mg/l | BOD mg/l | SETTL. SOLID ml/l | SUSP. SOLIDS lbs/day | BOD lbs/day | SUSP. SOLIDS %removal | BOD %remova | OIL & GREASE mg/l | OIL & GREASE lbs/day |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | 18 | 1351 |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 8 | 7.3 | 140 | 154 | 4.0 | 9630 | 10594 | -48% | -11% | | |
| 9 | | | | | | | | | | |
| 10 | | | | | | | | | | |
| 11 | | | | | | | | | | |
| 12 | | | | | | | | | | |
| 13 | | | | | | | | | | |
| 14 | | | | | | | | | | |
| 15 | 7.39 | 160 | 149 | 0.2 | 9875 | 9196 | -25% | -4% | | |
| 16 | | | | | | | | | | |
| 17 | | | | | | | | | | |
| 18 | | | | | | | | | | |
| 19 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| 21 | | | | | | | | | | |
| 22 | 7.53 | 82 | 109 | 0.3 | 4308 | 5727 | 10% | 12% | | |
| 23 | | | | | | | | | | |
| 24 | | | | | | | | | | |
| 25 | | | | | | | | | | |
| 26 | | | | | | | | | | |
| 27 | | | | | | | | | | |
| 28 | | | | | | | | | | |
| 29 | | | | | | | | | | |
| 30 | | | | | | | | | | |
| 31 | | | | | | | | | | |
| AVG | 7.41 | 129 | 137 | 1.5 | 7243 | 8350 | -21% | -1% | 18 | 1351 |
| MIN | 7.30 | 82 | 109 | 0.2 | 4308 | 5727 | -48% | -11% | 18 | 1351 |
| MAX | 7.53 | 160 | 154 | 4.0 | 9875 | 10594 | 10% | 12% | 18 | 1351 |

| PERMIT REQUIRMENTS | | | | | | | |
|---|---|---|---|---|---|---|---|
| MAX | monthly avg | 7 | 50 | 85 | 1 | 2504 | 4256 |
| 6 | daily max | 9 | 100 | 170 | 2 | 5008 | 8512 |

VIOLATIONS
BOD
SUSPENDED SOLIDS
SETTLEABLE SOLIDS
FLOW

ND 1576

PERM. NAME/ADDRESS (Include facility Name/Location if Different)

NAME: Guam Waterworks Authority
ADDRESS: P.O. Box 3010
AGANA, GUAM 96932

FACILITY: Northern District Sewage Treatment Plant
LOCATION: Dededo, Guam

# NATIONAL POLLUTION DISCHARGE ELIMINATION SYS... (NPDES)
## DISCHARGE MONITORING REPORT (DMR)

Form Approved.
OMB No. 2040-0004
Approval expires 9-30-85

(2-16) GU0020141 PERMIT NUMBER

(17-19) 001 DISCHARGE NUMBER

MONITORING PERIOD

| | YEAR | MO | DAY | | YEAR | MO | DAY |
|---|---|---|---|---|---|---|---|
| FROM | 2000 | 4 | 1 | TO | 2000 | 4 | 30 |
| | (20-21) | (22-23) | (24-25) | | (26-27) | (28-29) | (30-31) |

NOTE: Read instructions before completing this form.

| PARAMETER (32-37) | | (3 Card only) (46-53) QUANTITY OR LOADING AVERAGE | (54-61) MAXIMUM | UNITS | (4 Card Only) (38-45) QUANTITY OR CONCENTRATION MINIMUM | (46-53) AVERAGE | (54-61) MAXIMUM | UNITS | NO. EX. (62-63) | FREQUENCY OF ANALYSIS (64-68) | SAMPLE TYPE (69-70) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FLOW | SAMPLE MEASUREMENT | 5.9 | 6.9 | mgd | | | | mgd | 15 | 30/30 | HOURLY |
| | PERMIT REQUIREMENT | | 9.0 | | | | | | | | CONTINUOUS |
| INFLUENT BOD | SAMPLE MEASUREMENT | 9083 | 9830 | lbs/day | 145 | 168 | 187 | mg/l | | 4/30 | COMPOSITE |
| | PERMIT REQUIREMENT | | | | | | | | | | COMPOSITE |
| EFFLUENT BOD | SAMPLE MEASUREMENT | 7089 | 7884 | lbs/day | 118 | 131 | 137 | mg/l | 2 | 4/30 | COMPOSITE |
| | PERMIT REQUIREMENT | 4256 | 6812 | | | 85 | 170 | | | 1/7 | COMPOSITE |
| INFLUENT SUSPENDED SOLIDS | SAMPLE MEASUREMENT | 9369 | 11196 | lbs/day | 109 | 172 | 204 | mg/l | | 4/30 | COMPOSITE |
| | PERMIT REQUIREMENT | | | | | | | | | | COMPOSITE |
| EFFLUENT SUSPENDED SOLIDS | SAMPLE MEASUREMENT | 5259 | 5640 | lbs/day | 88 | 96 | 100 | mg/l | 4 | 4/30 | COMPOSITE |
| | PERMIT REQUIREMENT | 2504 | 5008 | | | 60 | 100 | | | 1/7 | COMPOSITE |
| EFFLUENT SETTLEABLE SOLIDS | SAMPLE MEASUREMENT | | | | 0.2 | 0.3 | 0.3 | ml/l | 0 | 4/30 | DISCRETE |
| | PERMIT REQUIREMENT | | | | | 1.0 | 2.0 | | | 1/7 | DISCRETE |
| EFFLUENT OIL & GREASE | SAMPLE MEASUREMENT | 1285 | 1285 | lbs/day | 23.7 | 23.7 | 23.7 | mg/l | | 1/30 | DISCRETE |
| | PERMIT REQUIREMENT | | | | | | | | | 1/30 | DISCRETE |
| EFFLUENT pH | SAMPLE MEASUREMENT | | | | 6.5 | 7.3 | 7.8 | | 0 | 4/30 | DISCRETE |
| | PERMIT REQUIREMENT | | | | 7.0 | | 9.0 | | | 1/7 | DISCRETE |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

NAME/TITLE PRINCIPLE EXECUTIVE OFFICER

HERBERT J. JOHNSTON Jr.

GENERAL MANAGER, GWA
ACTING

TYPED OR PRINTED

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION I BELIEVE THE SUBMITTED INFORMATION IS TRUE ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT SEE. 18 USC 1001 AND 33 USC 1319 (Penalties under these statutes may include fines up to $10,000 and or a maximum imprisonment of between 6 months and 5 years)

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

| TELEPHONE | | DATE | | |
|---|---|---|---|---|
| AREA CODE | NUMBER | YEAR | MO | DAY |
| 671 | 479-7844 | | | |

COMMENT AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

The daily flow was above the allowable maximum of 6 mgd on 15 out of 30 days this month

BOD monthly average concentration was exceeded by 46 mg/l, and the monthly average loading by 2833 lbs/day.

Suspended solids monthly average concentration was exceeded by 46 mg/l, and the monthly average loading by 2755 lbs/day.

5/24/00

Explanation of violations attached at end of DMR's

ND 1577

NORTHERN DISTRICT TREATMENT PLANT WASTEWATER RESULTS
FOR THE MONTH OF APRIL 2000

INFLUENT

| DATE | pH | SUSP. SOLIDS mg/l | BOD mg/l | SETTL. SOLID ml/l | SUSP. SOLIDS lbs/day | BOD lbs/day | FLOW mgd |
|---|---|---|---|---|---|---|---|
| 1 | | | | | | | 5.80 |
| 2 | | | | | | | 5.80 |
| 3 | | | | | | | 5.70 |
| 4 | | | | | | | 6.90 |
| 5 | 7.90 | 197 | N/A | 5.5 | 11196 | N/A | 6.80 |
| 6 | | | | | | | 6.00 |
| 7 | | | | | | | 5.20 |
| 8 | | | | | | | 6.70 |
| 9 | | | | | | | 6.10 |
| 10 | | | | | | | 4.60 |
| 11 | | | | | | | 5.80 |
| 12 | 6.80 | 178 | 145 | 5.0 | 9481 | 7753 | 6.40 |
| 13 | | | | | | | 5.40 |
| 14 | | | | | | | 5.40 |
| 15 | | | | | | | 5.00 |
| 16 | | | | | | | 6.80 |
| 17 | | | | | | | 5.00 |
| 18 | | | | | | | 4.80 |
| 19 | 7.72 | 109 | 171 | 5.0 | 6265 | 9830 | 6.90 |
| 20 | | | | | | | 6.80 |
| 21 | | | | | | | 6.70 |
| 22 | | | | | | | 5.60 |
| 23 | | | | | | | 5.10 |
| 24 | | | | | | | 5.60 |
| 25 | | | | | | | 7.80 |
| 26 | 7.88 | 204 | 187 | 5.0 | 10536 | 9666 | 6.20 |
| 27 | | | | | | | 6.70 |
| 28 | | | | | | | 4.00 |
| 29 | | | | | | | 5.30 |
| 30 | | | | | | | 6.70 |
| 31 | | | | | | | |
| AVG | 7.58 | 172 | 168 | 5.1 | 9369 | 9083 | 5.95 |
| MIN | 6.80 | 109 | 145 | 5.0 | 6265 | 7753 | 4.00 |
| MAX | 7.90 | 204 | 187 | 5.5 | 11196 | 9830 | 6.90 |

EFFLUENT

| DATE | pH | SUSP. SOLIDS mg/l | BOD mg/l | SETTL. SOLID ml/l | SUSP. SOLIDS lbs/day | BOD lbs/day | SUSP. SOLIDS %removal | BOD %removal | OIL & GREASE mg/l | OIL & GREASE lbs/day |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | 7.45 | 88 | N/A | 0.3 | 4991 | | 55% | | | |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |
| 9 | | | | | | | | | | |
| 10 | | | | | | | | | | |
| 11 | | | | | | | | | | |
| 12 | 6.46 | 100 | 118 | 0.3 | 5640 | 6298 | 44% | 19% | | |
| 13 | | | | | | | | | | |
| 14 | | | | | | | | | | |
| 15 | | | | | | | | | | |
| 16 | | | | | | | | | | |
| 17 | | | | | | | | | | |
| 18 | | | | | | | | | | |
| 19 | 7.32 | 98 | 137 | 0.2 | 5640 | 7884 | 10% | 20% | | |
| 20 | | | | | | | | | | |
| 21 | | | | | | | | | | |
| 22 | | | | | | | | | | |
| 23 | | | | | | | | | | |
| 24 | | | | | | | | | | |
| 25 | | | | | | | | | 23.7 | 1285 |
| 26 | 7.77 | 98 | 137 | 0.2 | 5627 | 7884 | 62% | 27% | | |
| 27 | | | | | | | | | | |
| 28 | | | | | | | | | | |
| 29 | | | | | | | | | | |
| 30 | | | | | | | | | | |
| 31 | | | | | | | | | | |
| AVG | 7.25 | 95 | 131 | 0.3 | 5419 | 7089 | 40% | 22% | 23.7 | 1285 |
| MIN | 6.46 | 88 | 118 | 0.2 | 4991 | 6298 | 10% | 19% | 23.7 | 1285 |
| MAX | 7.77 | 100 | 137 | 0.3 | 5640 | 7884 | 55% | 27% | 23.7 | 1285 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| PERMIT REQUIRMENTS | MAX | monthly avg | 7 | 50 | 85 | 1 | 2504 | 4256 |
| | 6 | daily max | 9 | 100 | 170 | 2 | 5008 | 8512 |

VIOLATIONS
BOD
SUSPENDED SOLIDS
FLOW

ND 1578

PERMITTEE NAME/ADDRESS (Include facility Name/Location if Different)

NAME: Guam Waterworks Authority
ADDRESS: P.O. Box 3010
AGANA, GUAM 96932

FACILITY: Northern District Sewage Treatment Plant
LOCATION: Dededo, Guam

# NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES)
## DISCHARGE MONITORING REPORT (DMR)

Form Approved.
OMB No. 2040-0004
Approval expires 9-30-85

| (2-16) | (17-19) |
|---|---|
| GU0020141 | 001 |
| PERMIT NUMBER | DISCHARGE NUMBER |

MONITORING PERIOD

| | YEAR | MO | DAY | | YEAR | MO | DAY |
|---|---|---|---|---|---|---|---|
| FROM | 2000 | 5 | 1 | TO | 2000 | 5 | 31 |
| | (20-21) | (22-23) | (24-25) | | (26-27) | (28-29) | (30-31) |

NOTE: Read instructions before completing this form.

| PARAMETER (32-37) | | (3 Card only) (46-53) | QUANTITY OR LOADING (54-61) | | (4 Card Only) (38-45) | QUANTITY OR CONCENTRATION (46-53) | (54-61) | | NO. EX. (62-63) | FREQUENCY OF ANALYSIS (64-68) | SAMPLE TYPE (69-70) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AVERAGE | MAXIMUM | UNITS | MINIMUM | AVERAGE | MAXIMUM | UNITS | | | |
| FLOW | SAMPLE MEASUREMENT | 5.2 | 6.8 | mgd | | | | mgd | 20 | 30/30 | HOURLY |
| | PERMIT REQUIREMENT | | 8.0 | | | | | | | | |
| INFLUENT BOD | SAMPLE MEASUREMENT | 8033 | 13266 | lbs/day | 137 | 175 | 241 | mg/l | | 4/30 | COMPOSITE |
| | PERMIT REQUIREMENT | | | | | | | | | | |
| EFFLUENT BOD | SAMPLE MEASUREMENT | 6416 | 8477 | lbs/day | 141 | 152 | 166 | mg/l | 2 | 4/30 | COMPOSITE |
| | PERMIT REQUIREMENT | 7245 | 9917 | | | 30 | 170 | | | 1/7 | COMPOSITE |
| INFLUENT SUSPENDED SOLIDS | SAMPLE MEASUREMENT | 7744 | 10582 | lbs/day | 88 | 193 | 288 | mg/l | | 4/30 | COMPOSITE |
| | PERMIT REQUIREMENT | | | | | | | | | | |
| EFFLUENT SUSPENDED SOLIDS | SAMPLE MEASUREMENT | 3431 | 5551 | lbs/day | 58 | 75 | 104 | mg/l | 4 | 4/30 | COMPOSITE |
| | PERMIT REQUIREMENT | 7245 | 9917 | | | 30 | 100 | | | 1/7 | COMPOSITE |
| EFFLUENT SETTLEABLE SOLIDS | SAMPLE MEASUREMENT | | | | 1.7 | 4.6 | 8.0 | ml/l | 4 | 4/30 | DISCRETE |
| | PERMIT REQUIREMENT | | | | | 1.0 | 2.0 | | | 1/7 | DISCRETE |
| EFFLUENT OIL & GREASE | SAMPLE MEASUREMENT | 1319 | 1319 | lbs/day | 23.6 | 23.6 | 23.6 | mg/l | | 1/30 | DISCRETE |
| | PERMIT REQUIREMENT | | | | | | | | | 1/90 | DISCRETE |
| EFFLUENT pH | SAMPLE MEASUREMENT | | | | 6.8 | 7.3 | 7.6 | | 0 | 4/31 | DISCRETE |
| | PERMIT REQUIREMENT | | | | 7.0 | | 9.0 | | | 1/7 | DISCRETE |
| | | | | | | | | | | | |

| NAME/TITLE PRINCIPLE EXECUTIVE OFFICER | | | TELEPHONE | | DATE | | |
|---|---|---|---|---|---|---|---|
| HERBERT J. JOHNSTON Jr.<br>GENERAL MANAGER, GWA<br>ACTING | I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION I BELIEVE THE SUBMITTED INFORMATION IS TRUE ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT SEE 18 USC §1001 AND 33 USC §1319 (Penalties under these statutes may include fines up to $10,000 and or a maximum imprisonment of between 6 months and 5 years) | | 671 | 479-7844 | | | |
| TYPED OR PRINTED | | SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT | AREA CODE | NUMBER | YEAR | MO | DAY |

COMMENT AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

The daily flow was above the allowable maximum twenty times this month. Overflows were reported on the 13, 16, 19-22 at the southern link pump station.
BOD monthly average concentration was exceeded .
Suspended solids monthly average concentration was exceeded due to a high concentration on the 31st.
Settleable solids monthly average was exceeded .

6/21/00

6/12/00

ND 1579

NORTHERN DISTRICT TREATMENT PLANT WASTEWATER RESULTS
FOR THE MONTH OF MAY 2000

INFLUENT

| DATE | pH | SUSP. SOLIDS mg/l | BOD mg/l | SETTLE. SOLID ml/l | SUSP. SOLIDS lbs/day | BOD lbs/day | FLOW mgd |
|---|---|---|---|---|---|---|---|
| 1 | | | | | | | |
| 2 | | | | | | | |
| 3 | N/S | N/S | N/S | N/S | N/S | N/S | |
| 4 | | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |
| 8 | | | | | | | |
| 9 | | | | | | | 1.20 |
| 10 | 7.55 | 176 | 167 | 6.5 | 10582 | 9053 | |
| 11 | | | | | | | 6.00 |
| 12 | | | | | | | |
| 13 | | | | | | | |
| 14 | | | | | | | 1.20 |
| 15 | | | | | | | |
| 16 | | | | | | | |
| 17 | 6.75 | 288 | 137 | 7.5 | 3122 | 1485 | 1.30 |
| 18 | | | | | | | |
| 19 | | | | | | | 1.20 |
| 20 | | | | | | | 1.10 |
| 21 | | | | | | | 1.10 |
| 22 | | | | | | | 1.10 |
| 23 | | | | | | | |
| 24 | 7.49 | 220 | 241 | 2.0 | 7786 | 13266 | |
| 25 | | | | | | | 4.80 |
| 26 | | | | | | | 4.70 |
| 27 | | | | | | | 6.00 |
| 28 | | | | | | | |
| 29 | | | | | | | |
| 30 | | | | | | | |
| 31 | 7.48 | 88 | 156 | 4.0 | 4864 | 8327 | |
| AVG | 7.32 | 193 | 175 | 5.0 | 6589 | 8833 | 5.21 |
| MIN | 6.75 | 88 | 137 | 2.0 | 3122 | 1485 | 1.10 |
| MAX | 7.55 | 288 | 241 | 7.5 | 10582 | 13266 | 6.80 |

EFFLUENT

| DATE | pH | SUSP. SOLIDS mg/l | BOD mg/l | SETTLE. SOLID ml/l | SUSP. SOLIDS lbs/day | BOD lbs/day | SUSP. SOLIDS %removal | BOD %removal | OIL & GREASE mg/l | OIL & GREASE lbs/day |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | N/S | N/S | N/S | N/S | N/S | N/S | N/S | N/S | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |
| 9 | | | | | | | | | | |
| 10 | 7.58 | 62 | 146 | | 3381 | 7660 | 65% | 13% | | |
| 11 | | | | | | | | | | |
| 12 | | | | | | | | | | |
| 13 | | | | | | | | | | |
| 14 | | | | | | | | | | |
| 15 | | | | | | | | | 23.6 | 1318.72 |
| 16 | | | | | | | | | | |
| 17 | 6.76 | 58 | 166 | | 629 | 1800 | 80% | -21% | | |
| 18 | | | | | | | | | | |
| 19 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| 21 | | | | | | | | | | |
| 22 | | | | | | | | | | |
| 23 | | | | | | | | | | |
| 24 | 7.52 | 76 | 154 | 1.7 | 4183 | 8477 | 65% | 36% | | |
| 25 | | | | | | | | | | |
| 26 | | | | | | | | | | |
| 27 | | | | | | | | | | |
| 28 | | | | | | | | | | |
| 29 | | | | | | | | | | |
| 30 | | | | | | | | | | |
| 31 | 7.25 | | 141 | | | 7526 | -18% | 10% | | |
| AVG | 7.28 | | | | | | 48% | 9% | 23.6 | 1319 |
| MIN | 6.76 | 58 | 141 | 1.7 | 629 | 1800 | -18% | -21% | 23.6 | 1319 |
| MAX | 7.58 | | 166 | | | 8477 | 80% | 36% | 23.6 | 1319 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| PERMIT REQUIREMENTS | MAX | monthly avg | 7 | 50 | 85 | 1 | 2504 | 4256 |
| | 6 | daily max | 9 | 100 | 170 | 2 | 5008 | 8512 |

VIOLATIONS
FLOW
SUSPENDED SOLIDS
BOD

ND 1580

6/12/00

PERMITTEE NAME/ADDRESS (Include facility Name/Location if Different)

NAME: Guam Waterworks Authority
ADDRESS: P.O. Box 3010
AGANA, GUAM 96932

FACILITY: Northern District Sewage Treatment Plant
LOCATION: Dededo, Guam

# NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES)
## DISCHARGE MONITORING REPORT (DMR)

Form Approved.
OMB No. 2040-0004
Approval expires 9-30-85

| (2-16) | (17-19) |
|---|---|
| GU0020141 | 001 |
| PERMIT NUMBER | DISCHARGE NUMBER |

MONITORING PERIOD

| | YEAR (20-21) | MO (22-23) | DAY (24-25) | | YEAR (26-27) | MO (28-29) | DAY (30-31) |
|---|---|---|---|---|---|---|---|
| FROM | 2000 | 6 | 1 | TO | 2000 | 6 | 30 |

NOTE: Read instructions before completing this form.

| PARAMETER (32-37) | | (3 Card only) (46-53) QUANTITY OR LOADING AVERAGE | (54-61) MAXIMUM | UNITS | (4 Card Only) (38-45) QUANTITY OR CONCENTRATION MINIMUM | (46-53) AVERAGE | (54-61) MAXIMUM | UNITS | NO. EX. (62-63) | FREQUENCY OF ANALYSIS (64-68) | SAMPLE TYPE (69-70) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FLOW | SAMPLE MEASUREMENT | 5.5 | 8.6 | mgd | | | | mgd | 19 | 30/30 | HOURLY |
| | PERMIT REQUIREMENT | | 6.0 | | | | | | | | CONTINUOUS |
| INFLUENT BOD | SAMPLE MEASUREMENT | 9614 | 11261 | lbs/day | 125 | 176 | 208 | mg/l | | 4/30 | COMPOSITE |
| | PERMIT REQUIREMENT | | | | | | | | | | COMPOSITE |
| EFFLUENT BOD | SAMPLE MEASUREMENT | 5688 | 8392 | lbs/day | 117 | 129 | 140 | mg/l | 1 | 4/30 | COMPOSITE |
| | PERMIT REQUIREMENT | 4256 | 8512 | | | 85 | 170 | | | 1/7 | COMPOSITE |
| INFLUENT SUSPENDED SOLIDS | SAMPLE MEASUREMENT | 6904 | 7699 | lbs/day | 107 | 126 | 160 | mg/l | | 4/30 | COMPOSITE |
| | PERMIT REQUIREMENT | | | | | | | | | | COMPOSITE |
| EFFLUENT SUSPENDED SOLIDS | SAMPLE MEASUREMENT | 5378 | 8607 | lbs/day | 30 | 102 | 132 | mg/l | 4 | 4/30 | COMPOSITE |
| | PERMIT REQUIREMENT | 7504 | 15008 | | | 50 | 100 | | | 1/7 | COMPOSITE |
| EFFLUENT SETTLEABLE SOLIDS | SAMPLE MEASUREMENT | | | | 0.3 | 1.7 | 3.0 | ml/l | 2 | 4/30 | DISCRETE |
| | PERMIT REQUIREMENT | | | | | 1.0 | 2.0 | | | 1/7 | DISCRETE |
| EFFLUENT OIL & GREASE | SAMPLE MEASUREMENT | 0 | 0 | lbs/day | 17.3 | 17.3 | 17.3 | mg/l | | 1/30 | DISCRETE |
| | PERMIT REQUIREMENT | | | | | | | | | 1/30 | DISCRETE |
| EFFLUENT pH | SAMPLE MEASUREMENT | | | | 7.2 | 7.3 | 7.3 | | 0 | 4/31 | DISCRETE |
| | PERMIT REQUIREMENT | | | | 7.0 | | 9.0 | | | 1/7 | DISCRETE |
| | | | | | | | | | | | |

| NAME/TITLE PRINCIPLE EXECUTIVE OFFICER | | TELEPHONE | | DATE | | |
|---|---|---|---|---|---|---|
| HERBERT J. JOHNSTON Jr.<br>GENERAL MANAGER, GWA<br>ACTING | I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION I BELIEVE THE SUBMITTED INFORMATION IS TRUE ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT SEE. 18 USC §1001 AND 33 USC §1319 (Penalties under these statutes may include fines up to $10,000 and or a maximum imprisonment of between 6 months and 5 years) | 671 | 479-7844 | AUG 0 4 2000 | | |
| TYPED OR PRINTED | SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT | AREA CODE | NUMBER | YEAR | MO | DAY |

COMMENT AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

The daily flow was above the allowable maximum nineteen times this month.
BOD monthly average concentration was exceeded by 44 mg/l, and the monthly average loading by 1432 lbs/day. The daily maximum loading was exceeded for 2 of the 3 samples.
Suspended solids monthly average concentration was exceeded by 52 mg/l, and the monthly average loading by 2874 lbs/day. The daily maximum concentration and loading was exceeded for 2 of the 3 sample
Settleable solids monthly average was exceeded by 0.7 ml/L, and the maximum daily allowable was exceeded for 1 of 4 samples.

7/25/00

7/24/00

ND 1581

TO: . TEWATER, NDSS FROM: LAB, JO BOYD

NORTHERN DISTRICT TREATMENT PLANT WASTEWATER RESULTS
FOR THE MONTH OF JUNE 00

INFLUENT

| DATE | pH | SUSP. SOLIDS mg/l | BOD mg/l | SETTLE. SOLID ml/l | SUSP. SOLIDS lbs/day | BOD lbs/day | FLOW mgd |
|---|---|---|---|---|---|---|---|
| 1 | | | | | | | |
| 2 | | | | | | | |
| 3 | | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |
| 8 | 7.45 | | | 6.0 | N/S | N/S | 1.40 |
| 9 | | | | | | | |
| 10 | | | | | | | |
| 11 | | | | | | | |
| 12 | | | | | | | |
| 13 | | | | | | | |
| 14 | 7.46 | 160 | 195 | 8.5 | 7052 | 8627 | 5.30 |
| 15 | | | | | | | |
| 16 | | | | | | | |
| 17 | | | | | | | |
| 18 | | | | | | | |
| 19 | | | | | | | |
| 20 | | | | | | | |
| 21 | 7.30 | 107 | 125 | 2.0 | 7699 | 8955 | 8.60 |
| 22 | | | | | | | |
| 23 | | | | | | | |
| 24 | | | | | | | |
| 25 | | | | | | | |
| 26 | | | | | | | |
| 27 | | | | | | | |
| 28 | 7.41 | 110 | 208 | 6.0 | 5961 | 11261 | 6.50 |
| 29 | | | | | | | |
| 30 | | | | | | | |
| 31 | | | | | | | |
| AVG | 7.41 | 126 | 176 | 5.6 | 6904 | 9614 | 5.45 |
| MIN | 7.30 | 107 | 125 | 2.0 | 5961 | 8627 | 1.40 |
| MAX | 7.46 | 160 | 208 | 8.5 | 7699 | 11261 | 8.60 |

EFFLUENT

| DATE | pH | SUSP. SOLIDS mg/l | BOD mg/l | SETTLE. SOLID ml/l | SUSP. SOLIDS lbs/day | BOD lbs/day | SUSP. SOLIDS %removal | BOD %removal | OIL & GREASE mg/l | OIL & GREASE lbs/day |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 8 | 7.28 | 30 | 140 | 0.3 | 350 | 1635 | | | | |
| 9 | | | | | | | | | | |
| 10 | | | | | | | | | | |
| 11 | | | | | | | | | | |
| 12 | | | | | | | | | | |
| 13 | | | | | | | | | | |
| 14 | 7.19 | 137 | 126 | 3.0 | 3835 | 5569 | 17% | 35% | | |
| 15 | | | | | | | | | | |
| 16 | | | | | | | | | | |
| 17 | | | | | | | | | | |
| 18 | | | | | | | | | | |
| 19 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| 21 | 7.26 | 120 | 117 | 2.0 | 8607 | 8392 | -12% | 6% | | |
| 22 | | | | | | | | | | |
| 23 | | | | | | | | | | |
| 24 | | | | | | | | | | |
| 25 | | | | | | | | | 17.3 | 0 |
| 26 | | | | | | | | | | |
| 27 | | | | | | | | | | |
| 28 | 7.31 | 132 | 132 | 1.3 | 7127 | 7156 | -13% | 36% | | |
| 29 | | | | | | | | | | |
| 30 | | | | | | | | | | |
| 31 | | | | | | | | | | |
| AVG | 7.26 | 102 | 120 | 1.7 | 6177 | 6838 | -2% | 26% | 17.3 | 0 |
| MIN | 7.19 | 30 | 117 | 0.3 | 350 | 1635 | -13% | 6% | 17.3 | 0 |
| MAX | 7.31 | 132 | 140 | 3.0 | 8607 | 8392 | 17% | 36% | 17.3 | 0 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| PERMIT REQUIREMENTS | MAX | monthly avg | 7 | 50 | 85 | 1 | 2504 | 4256 |
| | 6 | daily max | 9 | 100 | 170 | 2 | 5008 | 8512 |

VIOLATIONS
SUSPENDED SOLIDS MONTHLY AVERAGE
BOD MONTHLY AVERAGE

ND 1582

7/24/00

PERMITTEE NAME/ADDRESS (Include facility Name/Location if Different)

NAME: Guam Waterworks Authority
ADDRESS: P.O. Box 3010
AGANA, GUAM 96932

FACILITY: Northern District Sewage Treatment Plant
LOCATION: Dededo, Guam

# NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES)
## DISCHARGE MONITORING REPORT (DMR)

Form Approved.
OMB No. 2040-0004
Approval expires 9-30-85

| (2-16) | (17-19) |
|---|---|
| GU0020141 | 001 |
| PERMIT NUMBER | DISCHARGE NUMBER |

MONITORING PERIOD

| | YEAR | MO | DAY | | YEAR | MO | DAY |
|---|---|---|---|---|---|---|---|
| FROM | 2000 | 7 | 1 | TO | 2000 | 7 | 31 |
| | (20-21) | (22-23) | (24-25) | | (26-27) | (28-29) | (30-31) |

NOTE: Read instructions before completing this form.

| PARAMETER (32-37) | | (3 Card only) (46-53) | QUANTITY OR LOADING (54-61) | | (4 Card Only) (38-45) | QUANTITY OR CONCENTRATION (46-53) | (54-61) | | NO. EX. (62-63) | FREQUENCY OF ANALYSIS (64-68) | SAMPLE TYPE (69-70) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AVERAGE | MAXIMUM | UNITS | MINIMUM | AVERAGE | MAXIMUM | UNITS | | | |
| FLOW | SAMPLE MEASUREMENT | 2.2 | 7.9 | mgd | | | | mgd | 5 | 31/31 | HOURLY |
| | PERMIT REQUIREMENT | | 6.0 | | | | | | | | CONTINUOUS |
| INFLUENT BOD | SAMPLE MEASUREMENT | 912 | 1646 | lbs/day | 127 | 135 | 141 | mg/l | | 4/31 | COMPOSITE |
| | PERMIT REQUIREMENT | | | | | | | | | | COMPOSITE |
| EFFLUENT BOD | SAMPLE MEASUREMENT | 621 | 841 | lbs/day | 34 | 64 | 84 | mg/l | 0 | 4/31 | COMPOSITE |
| | PERMIT REQUIREMENT | 4258 | 8512 | | | 85 | 170 | | | 1/7 | COMPOSITE |
| INFLUENT SUSPENDED SOLIDS | SAMPLE MEASUREMENT | 1301 | 1728 | lbs/day | 76 | 126 | 154 | mg/l | | 4/31 | COMPOSITE |
| | PERMIT REQUIREMENT | | | | | | | | | | COMPOSITE |
| EFFLUENT SUSPENDED SOLIDS | SAMPLE MEASUREMENT | 239 | 374 | lbs/day | 10 | 23 | 32 | mg/l | 0 | 4/31 | COMPOSITE |
| | PERMIT REQUIREMENT | 2504 | 5008 | | | 50 | 100 | | | 1/7 | COMPOSITE |
| EFFLUENT SETTLEABLE SOLIDS | SAMPLE MEASUREMENT | | | | 0.1 | 0.2 | 0.2 | ml/l | 0 | 4/31 | DISCRETE |
| | PERMIT REQUIREMENT | | | | | 1.0 | 2.0 | | | 1/7 | DISCRETE |
| EFFLUENT OIL & GREASE | SAMPLE MEASUREMENT | 124 | 124 | lbs/day | 9.9 | 9.9 | 9.9 | mg/l | | 1/31 | DISCRETE |
| | PERMIT REQUIREMENT | | | | | | | | | 1/30 | DISCRETE |
| EFFLUENT pH | SAMPLE MEASUREMENT | | | | 7.3 | 7.5 | 7.9 | | 0 | 4/31 | DISCRETE |
| | PERMIT REQUIREMENT | | | | 7.0 | | 9.0 | | | 1/7 | DISCRETE |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

| NAME/TITLE PRINCIPLE EXECUTIVE OFFICER | | | TELEPHONE | | DATE | | |
|---|---|---|---|---|---|---|---|
| HERBERT J. JOHNSTON Jr.<br>GENERAL MANAGER, GWA<br>ACTING | I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION I BELIEVE THE SUBMITTED INFORMATION IS TRUE ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT SEE. 18 USC §1001 AND 33 USC §1319 (Penalties under these statutes may include fines up to $10,000 and or a maximum imprisonment of between 6 months and 5 years) | | 671 | 479-7844 | NOV 13 2000 | | |
| TYPED OR PRINTED | | SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT | AREA CODE | NUMBER | YEAR | MO | DAY |

COMMENT AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)
The daily flow was above the allowable maximum on 5 days this month.
pump station down on several days this month.

(S) 9/12/00

ND 1583

Explanation of violations attached at end of DMR's
9/12/00

NORTHERN DISTRICT TREATMENT PLANT WASTEWATER RESULTS
FOR THE MONTH OF JULY 00

INFLUENT

| DATE | pH | SUSP. SOLIDS mg/l | BOD mg/l | SETTLE. SOLID ml/l | SUSP. SOLIDS lbs/day | BOD lbs/day | FLOW mgd |
|---|---|---|---|---|---|---|---|
| 1 | | | | | | | [illegible] |
| 2 | | | | | | | [illegible] |
| 3 | | | | | | | [illegible] |
| 4 | | | | | | | 1.50 |
| 5 | 7.40 | 154 | 138 | 6.0 | 1541 | 30 | 1.20 |
| 6 | | | | | | | 1.20 |
| 7 | | | | | | | 0.90 |
| 8 | | | | | | | 1.50 |
| 9 | | | | | | | 1.40 |
| 10 | | | | | | | 1.50 |
| 11 | | | | | | | 1.30 |
| 12 | N/S | N/S | N/S | N/S | N/S | N/S | 1.10 |
| 13 | | | | | | | 1.40 |
| 14 | | | | | | | 1.60 |
| 15 | | | | | | | 1.30 |
| 16 | | | | | | | 1.40 |
| 17 | | | | | | | 1.40 |
| 18 | | | | | | | 1.30 |
| 19 | 7.53 | 76 | 127 | 7.5 | 634 | 1059 | 1.00 |
| 20 | | | | | | | 1.40 |
| 21 | | | | | | | 1.40 |
| 22 | | | | | | | 1.50 |
| 23 | | | | | | | 1.40 |
| 24 | | | | | | | 1.50 |
| 25 | | | | | | | 1.00 |
| 26 | 7.39 | 148 | 141 | 7.0 | 1728 | 1646 | 1.40 |
| 27 | | | | | | | 1.30 |
| 28 | | | | | | | 1.40 |
| 29 | | | | | | | 1.40 |
| 30 | | | | | | | [illegible] |
| 31 | | | | | | | [illegible] |
| AVG | 7.44 | 126 | 135 | 6.8 | 1301 | 912 | 2.23 |
| MIN | 7.39 | 76 | 127 | 6.0 | 634 | 30 | 0.90 |
| MAX | 7.53 | 154 | 141 | 7.5 | 1728 | 1646 | 7.90 |

EFFLUENT

| DATE | pH | SUSP. SOLIDS mg/l | BOD mg/l | SETTLE. SOLID ml/l | SUSP. SOLIDS lbs/day | BOD lbs/day | SUSP. SOLIDS %removal | BOD %removal | OIL & GREASE mg/l | OIL & GREASE lbs/day |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | 7.25 | 26 | 84 | 0.1 | 260 | 841 | 83% | 39% | | |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |
| 9 | | | | | | | | | | |
| 10 | | | | | | | | | | |
| 11 | | | | | | | | | | |
| 12 | N/S | N/S | N/S | N/S | N/S | N/S | N/S | N/S | | |
| 13 | | | | | | | | | | |
| 14 | | | | | | | | | | |
| 15 | | | | | | | | | | |
| 16 | | | | | | | | | | |
| 17 | | | | | | | | | | |
| 18 | | | | | | | | | | |
| 19 | 7.47 | 10 | 75 | 0.2 | 83 | 626 | 87% | 41% | | |
| 20 | | | | | | | | | | |
| 21 | | | | | | | | | | |
| 22 | | | | | | | | | | |
| 23 | | | | | | | | | | |
| 24 | | | | | | | | | 9.9 | 124 |
| 25 | | | | | | | | | | |
| 26 | 7.85 | 32 | 34 | 0.2 | 374 | 397 | 78% | 76% | | |
| 27 | | | | | | | | | | |
| 28 | | | | | | | | | | |
| 29 | | | | | | | | | | |
| 30 | | | | | | | | | | |
| 31 | | | | | | | | | | |
| AVG | 7.52 | 23 | 64 | 0.2 | 239 | 621 | 83% | 52% | 9.9 | 124 |
| MIN | 7.25 | 10 | 34 | 0.1 | 83 | 397 | 78% | 39% | 9.9 | 124 |
| MAX | 7.85 | 32 | 84 | 0.2 | 374 | 841 | 87% | 76% | 9.9 | 124 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| PERMIT REQUIREMENTS | MAX | monthly avg | 7 | 50 | 85 | 1 | 2504 | 4256 |
| | 6 | daily max | 9 | 100 | 170 | 2 | 5008 | 8512 |

VIOLATIONS
SUSPENDED SOLIDS MONTHLY AVERAGE
BOD MONTHLY AVERAGE

ND 1584

9/12/00

PERMITTEE NAME/ADDRESS (Include facility Name/Location if Different)

NAME: Guam Waterworks Authority
ADDRESS: P.O. Box 3010
AGANA, GUAM 96932

FACILITY: Northern District Sewage Treatment Plant
LOCATION: Dededo, Guam

# NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES)
## DISCHARGE MONITORING REPORT (DMR)

Form Approved.
OMB No. 2040-0004
Approval expires 9-30-85

(2-16) GU0020141 PERMIT NUMBER

(17-19) 001 DISCHARGE NUMBER

MONITORING PERIOD

| | YEAR | MO | DAY | | YEAR | MO | DAY |
|---|---|---|---|---|---|---|---|
| FROM | 2000 | 8 | 1 | TO | 2000 | 8 | 31 |
| | (20-21) | (22-23) | (24-25) | | (26-27) | (28-29) | (30-31) |

NOTE: Read instructions before completing this form.

| PARAMETER (32-37) | | (3 Card only) (46-53) QUANTITY OR LOADING AVERAGE | QUANTITY OR LOADING (54-61) MAXIMUM | UNITS | (4 Card Only) (38-45) QUANTITY OR CONCENTRATION MINIMUM | QUANTITY OR CONCENTRATION (46-53) AVERAGE | QUANTITY OR CONCENTRATION (54-61) MAXIMUM | UNITS | NO. EX. (62-63) | FREQUENCY OF ANALYSIS (64-68) | SAMPLE TYPE (69-70) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FLOW | SAMPLE MEASUREMENT | 6.6 | 6.8 | mgd | | | | mgd | 30 | 31/31 | HOURLY |
| | PERMIT REQUIREMENT | | 6.0 | | | | | | | | CONTINUOUS |
| INFLUENT BOD | SAMPLE MEASUREMENT | 4107 | 8609 | lbs/day | 134 | 164 | 202 | mg/l | | 3/31 | COMPOSITE |
| | PERMIT REQUIREMENT | | | | | | | | | | COMPOSITE |
| EFFLUENT BOD | SAMPLE MEASUREMENT | 7224 | 9584 | lbs/day | 113 | 136 | 169 | mg/l | 3 | 3/31 | COMPOSITE |
| | PERMIT REQUIREMENT | 3255 | 8512 | | | 85 | 170 | | | 1/7 | COMPOSITE |
| INFLUENT SUSPENDED SOLIDS | SAMPLE MEASUREMENT | 4360 | 11718 | lbs/day | 128 | 174 | 228 | mg/l | | 4/31 | COMPOSITE |
| | PERMIT REQUIREMENT | | | | | | | | | | COMPOSITE |
| EFFLUENT SUSPENDED SOLIDS | SAMPLE MEASUREMENT | 5538 | 7461 | lbs/day | 80 | 105 | 142 | mg/l | 8 | 4/31 | COMPOSITE |
| | PERMIT REQUIREMENT | 2504 | 6008 | | | 50 | 100 | | | 1/7 | COMPOSITE |
| EFFLUENT SETTLEABLE SOLIDS | SAMPLE MEASUREMENT | | | | 0.2 | 0.3 | 0.4 | ml/l | 0 | 4/31 | DISCRETE |
| | PERMIT REQUIREMENT | | | | | 1.0 | 20 | | | 1/7 | DISCRETE |
| EFFLUENT OIL & GREASE | SAMPLE MEASUREMENT | 672 | 672 | lbs/day | 12.2 | 12.2 | 12.2 | mg/l | | 1/30 | DISCRETE |
| | PERMIT REQUIREMENT | | | | | | | | | 1/30 | DISCRETE |
| EFFLUENT pH | SAMPLE MEASUREMENT | | | | 7.2 | 7.2 | 7.3 | | 0 | 4/31 | DISCRETE |
| | PERMIT REQUIREMENT | | | | 7.0 | | 9.0 | | | 1/7 | DISCRETE |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

NAME/TITLE PRINCIPLE EXECUTIVE OFFICER

HERBERT J. JOHNSTON Jr.

GENERAL MANAGER, GWA
ACTING

TYPED OR PRINTED

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION I BELIEVE THE SUBMITTED INFORMATION IS TRUE ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT SEE. 18 USC §1001 AND 33 USC §1319 (Penalties under these statutes may include fines up to $10,000 and or a maximum imprisonment of between 6 months and 5 years).

SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT

| TELEPHONE | | DATE | | |
|---|---|---|---|---|
| AREA CODE | NUMBER | YEAR | MO | DAY |
| 671 | 479-7844 | NOV | 13 | 2000 |

COMMENT AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

VIOLATIONS

MONTHLY FLOW EXCEEDED 30 OUT OF 31 DAYS
SUSPENDED SOLIDS MONTHLY AVERAGEAND DAILY MAX EXCEEDED
BOD MONTHLY AVERAGE

11/3/00

Explanation of violations attached at end of DMR's

11/1/00

ND 1585

TO: WASTEWATER, NDSS FROM: LAB, JO BOYD

**NORTHERN DISTRICT TREATMENT PLANT WASTEWATER RESULTS**
**FOR THE MONTH OF AUGUST 2000**

**INFLUENT**

| DATE | pH | SUSP. SOLIDS mg/l | BOD mg/l | SETTLE. SOLID ml/l | SUSP. SOLIDS lbs/day | BOD lbs/day | FLOW mgd |
|---|---|---|---|---|---|---|---|
| 1 | | | | | | | 6.40 |
| 2 | 7.48 | 228 | 155 | 5.5 | 11718 | 8609 | 5.80 |
| 3 | | | | | | | 6.60 |
| 4 | | | | | | | 6.80 |
| 5 | | | | | | | 6.90 |
| 6 | | | | | | | 6.70 |
| 7 | | | | | | | 6.80 |
| 8 | | | | | | | 6.70 |
| 9 | 7.59 | 192 | 134 | 4.0 | 1938 | 1261 | 6.30 |
| 10 | | | | | | | 6.60 |
| 11 | | | | | | | 6.30 |
| 12 | | | | | | | 6.60 |
| 13 | | | | | | | 6.60 |
| 14 | | | | | | | 6.80 |
| 15 | | | | | | | 6.70 |
| 16 | 7.46 | 128 | 202 | 6.5 | 2125 | 2452 | 6.80 |
| 17 | | | | | | | 6.60 |
| 18 | | | | | | | 6.70 |
| 19 | | | | | | | 6.50 |
| 20 | | | | | | | 6.40 |
| 21 | | | | | | | 6.80 |
| 22 | | | | | | | 6.80 |
| 23 | 7.47 | 148 | | 10.0 | 1658 | | 6.80 |
| 24 | | | | | | | 6.70 |
| 25 | | | | | | | 6.80 |
| 26 | | | | | | | 6.10 |
| 27 | | | | | | | 6.70 |
| 28 | | | | | | | 6.80 |
| 29 | | | | | | | 6.70 |
| 30 | | | | | | | 6.30 |
| 31 | | | | | | | 6.70 |
| AVG | 7.50 | 174 | 164 | 6.5 | 4360 | 4107 | 6.57 |
| MIN | 7.46 | 128 | 134 | 4.0 | 1658 | 1261 | 5.80 |
| MAX | 7.59 | 228 | 202 | 10.0 | 11718 | 8609 | 6.80 |

**EFFLUENT**

| DATE | pH | SUSP. SOLIDS mg/l | BOD mg/l | SETTLE. SOLID ml/l | SUSP. SOLIDS lbs/day | BOD lbs/day | SUSP. SOLIDS %removal | BOD %removal | OIL & GREASE mg/l | OIL & GREASE lbs/day |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | |
| 2 | 7.19 | 80 | 113 | 0.2 | 3870 | 5466 | 65% | 27% | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| 6 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |
| 9 | 7.34 | 98 | 126 | 0.4 | 5149 | 6620 | 49% | 6% | | |
| 10 | | | | | | | | | | |
| 11 | | | | | | | | | | |
| 12 | | | | | | | | | | |
| 13 | | | | | | | | | | |
| 14 | | | | | | | | | | |
| 15 | | | | | | | | | | |
| 16 | 7.2 | 100 | 169 | 0.2 | 5671 | 9584 | 22% | 16% | | |
| 17 | | | | | | | | | | |
| 18 | | | | | | | | | | |
| 19 | | | | | | | | | | |
| 20 | | | | | | | | | | |
| 21 | | | | | | | | | | |
| 22 | | | | | | | | | | |
| 23 | 7.24 | 142 | | 0.2 | 7461 | | 4% | | | |
| 24 | | | | | | | | | | |
| 25 | | | | | | | | | 12.2 | 672 |
| 26 | | | | | | | | | | |
| 27 | | | | | | | | | | |
| 28 | | | | | | | | | | |
| 29 | | | | | | | | | | |
| 30 | | | | | | | | | | |
| 31 | | | | | | | | | | |
| AVG | 7.24 | 105 | 136 | 0.3 | 5638 | 7224 | 35% | 16% | 12.2 | 672 |
| MIN | 7.19 | 80 | 113 | 0.2 | 3870 | 5466 | 4% | 6% | 12.2 | 672 |
| MAX | 7.34 | 142 | 169 | 0.4 | 7461 | 9584 | 65% | 27% | 12.2 | 672 |

| PERMIT REQUIREMENTS | | | | | | | |
|---|---|---|---|---|---|---|---|
| MAX | monthly avg | 7 | 50 | 85 | 1 | 2504 | 4256 |
| 6 | daily max | 9 | 100 | 170 | 2 | 5008 | 8512 |

**VIOLATIONS**
MONTHLY FLOW EXCEEDED 30 OUT OF 31 DAYS
SUSPENDED SOLIDS MONTHLY AVERAGEAND DAILY MAX EXCEEDED
BOD MONTHLY AVERAGE

ND 1586

11/1/00

PERMITTEE NAME/ADDRESS (Include facility Name/Location if Different)

NAME: Guam Waterworks Authority
ADDRESS: P.O. Box 3010
AGANA, GUAM 96932

FACILITY: Northern District Sewage Treatment Plant
LOCATION: Dededo, Guam

# NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES)
## DISCHARGE MONITORING REPORT (DMR)

Form Approved.
OMB No. 2040-0004
Approval expires 9-30-85

(2-16) GU0020141 PERMIT NUMBER

(17-19) 001 DISCHARGE NUMBER

MONITORING PERIOD

| | YEAR | MO | DAY | | YEAR | MO | DAY |
|---|---|---|---|---|---|---|---|
| FROM | 2000 | 9 | 1 | TO | 2000 | 9 | 30 |
| | (20-21) | (22-23) | (24-25) | | (26-27) | (28-29) | (30-31) |

NOTE: Read instructions before completing this form.

| PARAMETER (32-37) | | (3 Card only) QUANTITY OR LOADING (46-53) AVERAGE | (54-61) MAXIMUM | UNITS | (4 Card Only) QUANTITY OR CONCENTRATION (38-45) MINIMUM | (46-53) AVERAGE | (54-61) MAXIMUM | UNITS | NO. EX. (62-63) | FREQUENCY OF ANALYSIS (64-68) | SAMPLE TYPE (69-70) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FLOW | SAMPLE MEASUREMENT | 5.6 | 7.3 | mgd | | | | mgd | 24 | 30/30 | HOURLY |
| | PERMIT REQUIREMENT | | 8.0 | | | | | | | | CONTINUOUS |
| INFLUENT BOD | SAMPLE MEASUREMENT | 7230 | 9880 | lbs/day | 146 | 165 | 184 | mg/l | | 4/30 | COMPOSITE |
| | PERMIT REQUIREMENT | | | | | | | | | | COMPOSITE |
| EFFLUENT BOD | SAMPLE MEASUREMENT | 6251 | 8829 | lbs/day | 121 | 135 | 158 | mg/l | 3 | 4/30 | COMPOSITE |
| | PERMIT REQUIREMENT | 4256 | 8512 | | | 85 | 170 | | | 1/7 | COMPOSITE |
| INFLUENT SUSPENDED SOLIDS | SAMPLE MEASUREMENT | 7136 | 9926 | lbs/day | 137 | 152 | 170 | mg/l | | 4/30 | COMPOSITE |
| | PERMIT REQUIREMENT | | | | | | | | | | COMPOSITE |
| EFFLUENT SUSPENDED SOLIDS | SAMPLE MEASUREMENT | 4364 | 7671 | lbs/day | 66 | 91 | 126 | mg/l | 5 | 4/30 | COMPOSITE |
| | PERMIT REQUIREMENT | 2504 | 5008 | | | 30 | 100 | | | 1/7 | COMPOSITE |
| EFFLUENT SETTLEABLE SOLIDS | SAMPLE MEASUREMENT | | | | 0.1 | 0.2 | 0.3 | ml/l | 0 | 4/30 | DISCRETE |
| | PERMIT REQUIREMENT | | | | | 10 | 20 | | | 1/7 | DISCRETE |
| EFFLUENT OIL & GREASE | SAMPLE MEASUREMENT | 615 | 615 | lbs/day | 11.0 | 11.0 | 11.0 | mg/l | | 1/30 | DISCRETE |
| | PERMIT REQUIREMENT | | | | | | | | | 1/30 | DISCRETE |
| EFFLUENT pH | SAMPLE MEASUREMENT | | | | 7.3 | 7.5 | 7.7 | | 0 | 4/31 | DISCRETE |
| | PERMIT REQUIREMENT | | | | 7.0 | | 9.0 | | | 1/7 | DISCRETE |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

| NAME/TITLE PRINCIPLE EXECUTIVE OFFICER | | TELEPHONE | | DATE | | |
|---|---|---|---|---|---|---|
| HERBERT J. JOHNSTON Jr.<br>GENERAL MANAGER, GWA<br>ACTING | I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED HEREIN AND BASED ON MY INQUIRY OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION I BELIEVE THE SUBMITTED INFORMATION IS TRUE ACCURATE AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT SEE. 18 USC $1001 AND 33 USC $1319 (Penalties under these statutes may include fines up to $10,000 and or a maximum imprisonment of between 6 months and 5 years) | | 671 | 479-7844 | NOV | 13 | 2000 |
| TYPED OR PRINTED | | SIGNATURE OF PRINCIPAL EXECUTIVE OFFICER OR AUTHORIZED AGENT | AREA CODE | NUMBER | YEAR | MO | DAY |

COMMENT AND EXPLANATION OF ANY VIOLATIONS (Reference all attachments here)

VIOLATIONS

SUSPENDED SOLIDS MONTHLY AVERAGE AND DAILY MAX FOR BOTH MG/L AND LBS. /DA 11/8/00

BOD MONTHLY AVERAGE AND DAILY MAX

Explanation of violations attached at end of DMR's

ND 1587

11/8/00

TO: WASTEWATER, NDSS FROM: LAB, F. LIZAMA

NORTHERN DISTRICT TREATMENT PLANT WASTEWATER RESULTS
FOR THE MONTH OF SEPTEMBER 2000

INFLUENT

| DATE | pH | SUSP. SOLIDS mg/l | BOD mg/l | SETTLE. SOLID ml/l | SUSP. SOLIDS lbs/day | BOD lbs/day | FLOW mgd |
|---|---|---|---|---|---|---|---|
| 1 | | | | | | | 6.70 |
| 2 | | | | | | | 6.70 |
| 3 | | | | | | | 6.30 |
| 4 | | | | | | | 6.40 |
| 5 | | | | | | | 6.40 |
| 6 | 7.44 | 139 | 169.5 | 0.5 | 9926 | 9880 | 7.30 |
| 7 | | | | | | | 7.00 |
| 8 | | | | | | | 6.90 |
| 9 | | | | | | | 6.70 |
| 10 | | | | | | | 6.30 |
| 11 | | | | | | | 7.00 |
| 12 | | | | | | | 6.50 |
| 13 | 7.47 | 137 | 146 | 9.0 | 7655 | 8130 | 6.70 |
| 14 | | | | | | | 6.50 |
| 15 | | | | | | | 6.70 |
| 16 | | | | | | | 6.60 |
| 17 | | | | | | | 0.90 |
| 18 | | | | | | | 1.20 |
| 19 | | | | | | | 1.40 |
| 20 | 7.83 | 170.00 | 184 | 6.50 | 1843 | 1995 | 1.30 |
| 21 | | | | | | | 1.50 |
| 22 | | | | | | | 1.20 |
| 23 | | | | | | | 7.00 |
| 24 | | | | | | | 6.30 |
| 25 | | | | | | | 6.00 |
| 26 | | | | | | | 6.60 |
| 27 | 7.86 | 162 | 163 | 0.1 | 9121 | 8916 | 6.70 |
| 28 | | | | | | | 6.40 |
| 29 | | | | | | | 6.80 |
| 30 | | | | | | | 6.80 |
| 31 | | | | | | | |
| AVG | 7.65 | 152 | 165 | 4.0 | 7136 | 7230 | 6.60 |
| MIN | 7.44 | 137 | 146 | 0.1 | 1843 | 1995 | 0.90 |
| MAX | 7.86 | 170 | 184 | 9.0 | 9926 | 9880 | 7.30 |

EFFLUENT

| DATE | pH | SUSP. SOLIDS mg/l | BOD mg/l | SETTLE. SOLID ml/l | SUSP. SOLIDS lbs/day | BOD lbs/day | SUSP. SOLIDS %removal | BOD %removal | OIL & GREASE mg/l | OIL & GREASE lbs/day |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| 6 | 7.28 | 126 | 132 | 0.3 | 7671 | 8036 | 9% | 22% | | |
| 7 | | | | | | | | | | |
| 8 | | | | | | | | | | |
| 9 | | | | | | | | | | |
| 10 | | | | | | | | | | |
| 11 | | | | | | | | | | |
| 12 | | | | | | | | | | |
| 13 | 7.36 | 94 | 121 | 0.1 | 5253 | 6761 | 31% | 17% | 11 | 615 |
| 14 | | | | | | | | | | |
| 15 | | | | | | | | | | |
| 16 | | | | | | | | | | |
| 17 | | | | | | | | | | |
| 18 | | | | | | | | | | |
| 19 | | | | | | | | | | |
| 20 | 7.66 | 78 | 127 | 0.1 | 846 | 1377 | 54% | 31% | | |
| 21 | | | | | | | | | | |
| 22 | | | | | | | | | | |
| 23 | | | | | | | | | | |
| 24 | | | | | | | | | | |
| 25 | | | | | | | | | | |
| 26 | | | | | | | | | | |
| 27 | 7.7 | 66 | 158 | 0.1 | 3688 | 8829 | 59% | 3% | | |
| 28 | | | | | | | | | | |
| 29 | | | | | | | | | | |
| 30 | | | | | | | | | | |
| 31 | | | | | | | | | | |
| AVG | 7.50 | 91 | 135 | 0.2 | 4364 | 6251 | 39% | 18% | 11 | 615 |
| MIN | 7.28 | 66 | 121 | 0.1 | 846 | 1377 | 9% | 3% | 11 | 615 |
| MAX | 7.70 | 126 | 158 | 0.3 | 7671 | 8829 | 59% | 31% | 11 | 615 |

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11/8/00

INDUSTRIAL USERS SERVEY FORM

(Includes 1999 results)

C 8

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# GWA COMMERCIAL WASTEWATER DISCHARGE SURVEY RESULTS

(October 15, 1999)

## I. Points of Interest Regarding the Survey

- The survey questionnaires were mailed out to all GWA commercial wastewater account holders during the first week of April 1999.
- The survey questionnaires were to be completed and mailed back to GWA NLT May 15, 1999; self-addressed, stamped envelopes were provided.
- During the interim, several calls regarding the survey were made to GWA.

## II. Statistical numbers

- Out of the approximately fifteen hundred (1500) surveys mailed out, three hundred sixty-six (366) were returned to GWA.
- When responding to the question "Do you discharge any non-domestic wastewater into the sewer system?" (survey question #5) – question that allowed respondents to forego the remaining survey questions and simply sign the acknowledgement on the last page – three hundred forty-six (346) replied "No" and twenty (20) replied "Yes."

## III. Breakdown of the Principal Service or Product of Business that responded to the survey

Hotel water park
Hemodialysis center
Laundromat
Manufacturer of soft drinks, ice, bottle water
Dental clinic
Wholesale/Retail of Fresh Seafood
Restaurant/Food court (water softener)
Daycare center (water softener)
Newspaper publisher
Commercial building (water softener)
Diagnostic Laboratory
Optical Laboratory
Medical Clinic
Pharmacy

- Shady approach toward Survey
- Out to have contacts individual SIPs | MW rate-users records
- Field Visits
- Do not know individual upstream users for individual POTW

## COMMERCIAL WASTEWATER DISCHARGE SURVEY

Completion of this questionnaire is required for all GWA commercial account wastewater dischargers. Please mail in the completed form no later than May 15, 1999. A self-addressed, stamped envelope is included.

PLEASE TYPE OR PRINT LEGIBLY. (NOTE: GWA will follow-up incomplete and illegible questionnaires by phone or official letter). Should you have any questions or need assistance in completing this questionnaire, please call GWA's Planning Division at 479-7833 or 479-7605 between the hours of 8:00 a.m. and 5:00 p.m., Monday through Friday. Thank you for your cooperation and timely response.

1. NAME OF BUSINESS (as it appears on GWA account): _____

MAILING ADDRESS: _____

2. BUSINESS LOCATION (if different from mailing address):

_____

3. YOUR PRINCIPAL SERVICE OR PRODUCT OF BUSINESS: _____

4. NAME OF INDIVIDUAL (WITHIN YOUR BUSINESS) WHO WE SHOULD CONTACT CONCERNING YOUR WASTEWATER DISCHARGE INTO THE PUBLIC SEWER:

NAME: _____
TITLE: _____
TELEPHONE NUMBER: _____

5. DO YOU DISCHARGE ANY NON-DOMESTIC WASTEWATER (FROM OTHER THAN WASHROOM, TOILET, OR SHOWER) INTO THE SEWER SYSTEM?

[ ] YES [ ] NO (GO TO QUESTION #16)

o. DESCRIBE THE OPERATION(S) AT YOUR BUSINESS THAT RESULT(S) IN THE DISCHARGE TO THE SEWER OF NON-DOMESTIC WASTES. INCLUDE A DESCRIPTION OF RAW MATERIALS, CATALYSTS, OR INTERMEDIARIES, IF APPLICA BLE. DESCRIBE ANY MANUFACTURING OPERATION AT THIS LOCATION. (ATTACH ADDITIONAL SHEETS AS NECESSARY):

_____
_____
_____
_____

7. DESCRIBE ANY WATER CONDITIONING PROCESSES USED AT THIS FACILITY (SUCH AS WATER SOFTENING, REVERSE OSMOSIS, FILTRATION):

_____
_____
_____
_____

8. INDICATE (BY CHECKMARK) OPERATION SHIFTS NORMALLY WORKED EACH DAY:

| SHIFT | START TIME | Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|---|---|---|---|---|---|---|---|---|
| 1ST | | | | | | | | |
| 2ND | | | | | | | | |
| 3RD | | | | | | | | |

9. IS YOUR PRODUCTION SEASONAL? [ ] YES [ ] NO

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10. CHECK THE TYPE WHICH BEST DESCRIBES YOUR WASTEWATER DISCHARGE FLOW:

[ ] CONTINUOUS

AVERAGE DAILY FLOW: _____ GALLONS PER DAY

[ ] INTERMITTENT

AVERAGE QUANTITY PER DISCHARGE: _____ GALLONS

AVERAGE NUMBER OF DISCHARGES PER DAY: _____

[ ] BATCH

AVERAGE QUANTITY PER DISCHARGE: _____ GALLONS

AVERAGE NUMBER OF DISCHARGES PER DAY: _____

11. INDICATE THE APPROXIMATE TIMES THAT DISCHARGES OCCUR:

| Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

12. DESCRIBE THE CHARACTERISTICS AND CONSTITUENTS OF YOUR WASTEWATER DISCHARGE(S). LIST THE CONCENTRATION (IN PERCENT OR MG/L) IF KNOWN:

13. DESCRIBE ANY TREATMENT FACILITIES AT YOUR BUSINESS THAT TREATS WASTEWATER PRIOR TO DISCHARGE TO THE SEWER:

14. ADDITIONAL INFORMATION ON YOUR OPERATION:

15. INDICATE IF ANY OF THE FOLLOWING CONSTITUENTS OR SUBSTANCES IS (OR CAN BE) PRESENT IN YOUR WATEWATER DISCHARGE AS A RESULT OF YOUR OPERATIONS BY PLACING IN FRONT OF EACH LISTED CHEMICAL COMPOUND:

1 = YOU SUSPECT THE COMPOUND IS ABSENT
2 = YOU KNOW THE COMPOUND IS ABSENT
3 = YOU SUSPECT THE COMPOUND IS PRESENT
4 = YOU KNOW THE COMPOUND IS PRESENT

[ ] Acenapthene
[ ] Acenapthylene (PAH)
[ ] Acrolein
[ ] Acrylonitrile
[ ] Aldrin
[ ] Antimony
[ ] Anthracene
[ ] Arsenic
[ ] Asbestos (Halomethanes)
[ ] 1,2 Benzanthracene (PAH)
[ ] Benzene
[ ] Benzidine
[ ] Benzo (A) Pyrene (3,4-Benzo-Pyrene) (PAH)
[ ]. 3,4 Benzofluoranthene (PAH)
[ ] Benzo (K) Fluoranthene (PAH)
[ ] 1,12 Benzoperylene (PAH)
[ ] Beryllium
[ ] Bromoform (Tribromomethane)
[ ] Bromomethane (Methyl Bromide)
] 4-Bromophenyl Phenyl Ether
] Cadmium
[ ] Carbon Tetrachloride (Tetrachloromethane)
[ ] Chlordane
[ ] Chlorobenzene (Monochloro-Benzene)
[ ] Chlorodibromomethane (Halomethane)
[ ] 1,2 Dichlorobenzene
[ ] 1,3 Dichlorobenzene
[ ] 1,4 Dichlorobenzene
[ ] 3,3 Dichlorobenzidine
[ ] Dichloroethane 1,1
[ ] Dichloroethane 1,2
[ ] 1,1 Dichloroethylene
[ ] 1,2-Trans-Dichloroethylene
[ ] Dichlorobromomethane
[ ] Dichloromethane (Halomethanes)
[ ] 2,4-Dichlorophenol
[ ] Dichloropropane 1,2
[ ] Dichloropropene 1,3
[ ] Dieldrin
[ ] Dimethylphenol 2,4
Diethylphthalate
Dimethylphthalate
[ ] Dinitrotoluene 2,4
[ ] Dinitrotoluene 2,6
[ ] 2,4 Dinitrophenol
[ ] Dioxine (2,3,7,8-TCDD)
[ ] Diphenylhydrazine 1,2
[ ] Alpha Endosulfan
[ ] Beta Endosulfan
[ ] Endosulfan Sulfate
[ ] Endrin
[ ] Endrin Aldehyde
[ ] Ethylbenzene
[ ] Chlorethane (Monochloroethane)
[ ] Chlorothyl Ether (Bis-2)
[ ] 1 Chloroethoxy Methane (Bis-2)
[ ] 2 Chloroethyl Vinyl Ether
[ ] 4-Chloro-3-Methylphenol
[ ] Chloromethane (Methyl Chloride)
[ ] Chloroform Trichloromethane
[-] 2 Chlorophenol
[ ] Chloroisopropyl Ether (Bis-2)
[ ] 2 Chloronaphthalene
[ ] 4-Chlorophenyl Ether
[ ] Chromium (HEX)
[ ] Chromium (TRI)
[ ] Oil / Grease (animal or vegetable origin)
[ ] Oil / Grease (mineral origin)
[ ] Petroleum or petroleum products
[ ] Chrysene (PAH)
[ ] Copper
[ ] pH decrease
[ ] pH increase
[ ] 4,4 DDT
[ ] 4,4 DDE
[ ] 4,4 DDD
[ ] Dibenzo (a,h) Anthracene (PAH)
[ ] 2,Nitrophenol
[ ] 4 Nitrophenol
[ ] 4, 6-Dinitro-2-Methylphenol
[ ] Nitrosodimenthylamine N
[ ] Nitrosodimenthylamine-N
[ ] Nitrosodi-N-Propylamine-N
[ ] PCB 1242
[ ] PCB 1254
[ ] PCB 1221
[ ] PCB 1232
Temperature decrease
- _____ F
Temperature increase
+ _____ F
[ ] PCB 1248
[ ] PCB 1260
[ ] PCB 1016
[ ] Fluorene (PAH)
[ ] Fluoranthene
[ ] Heptachlor
[ ] Heptachlor Epoxide
[ ] Hexachloroethane
[ ] Hexachlorobenzene
[ ] Hexachlorobutadiene
[ ] Hexachlorocyclohexane (lindane)
[ ] Hexachlorocyclohexane (Alpha)
[ ] Hexachlorocyclohexane (Beta)
[ ] Hexachlorocyclohexane (Delta)
[ ] Hexachlorocyclopentadiene
[ ] Indeno (1,2,3-cd) Pyrene (PAH)
[ ] Isophorone
[ ] Lead
[ ] Mercury
[ ] Naphthalene
[ ] Nickel
[ ] Nitrobenzene
[ ] Di-N-Butyl Phthalate
[ ] Di-N-Octyl-Phthalate
[ ] Pyrene (PAH)
[ ] Selenium
[ ] Silver
[ ] Tetracholoethane 1,1,2,2
[ ] Tetrachloroethylene
[ ] Thallium
[ ] Toluene
[ ] Toxaphene
[ ] 1,2,4 Trichlorobenzene
[ ] Trichloroethane 1,1,1
[ ] Trichloroethane 1,1,2
[ ] Trichloroethylene
[ ] Phenol
[ ] Pentachlorophenol
[ ] Phenanthrene (PAH)
[ ] Bis (2 Ethyl Hexyl)
[ ] Phthalate
[ ] Butyl Benzyl Phthalate
[ ] Trichlorophenol 2,4,6
[ ] Vinyl Chloride (Chloroethylene)
[ ] Zinc

OTHER COMPOUNDS NOT LISTED:
[ ] _____
[ ] _____
[ ] _____
[ ] _____
[ ] _____

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16. STATEMENT OF RESPONSIBILITY:

THIS IS TO CERTIFY THAT THE UNDERSIGNED RESPONSIBLE OFFICIAL REPRESENTING

_____, IS FAMILIAR AND KNOWLEDGEABLE WITH QUESTIONS CONTAINED

(Company)

HEREIN, AND THAT THIS QUESTIONNAIRE HAS BEEN COMPLETED IN ITS ENTIRETY AND IS CERTIFIED TO BE

TRUE AND CORRECT TO THE BEST OF KNOWLEDGE AND ABILITY

NAME: _____
(Please print)

SIGNATURE: _____

DATE: _____

TITLE: _____

END OF REVISED SECTION