GSJ
DS

09B MAIN

ENGINEERING SERVICE REQUEST (ESR)
NAVFAC 11000/7 (4-78)
Supersedes NAVDOCKS 2038
S/N 0105-LF-010-0035

Instructions on Reverse

Copy No.

TO
FROM

1. ~~FROM~~ (Activity and location)
Commanding General, Marine Corps Base, Camp Lejeune, NC 28542-5001

2. ~~TO~~
Commander, Atlantic Division, Naval Facilities Engineering Command
Norfolk, VA 23511-6287

SECTION A FOR USE BY REQUESTER

3. REFERENCE(S)

4. ESR IDENTIFICATION NUMBER (*if applicable*)
7E85

5. ENCLOSURE(S) (*check*)
☐ NAVCOMPT 140 ☐ OTHER (*specify*)
☐ NAVCOMPT 2038
☐ NAVCOMPT 372

6. TYPE OF FUNDING (*check*)
☐ O&MN ☒ OTHER (*specify*)
☐ NIF O&M
☐ NAF

7. TYPE OF SERVICES REQUESTED
Engineering Study is required to locate the sources of storm water infiltration into the Camp Geiger Water Treatment System.

8. DESIRED COMPLETION DATE
31 July 1985

9. DESCRIPTION OF WORK

I. GENERAL: Provide an engineering study to locate sources of storm water infiltration into the Camp Geiger Wastewater Treatment System and provide recommendations for eliminating infiltration.

II. BACKGROUND:

a. The Camp Geiger Wastewater Treatment System serves Camp Geiger and Marine Corps Air Station (Helicopter), New River. The design capacity

10. FOR INFORMATION CONSULT (*Name and phone*)
G. S. JOHNSON
AV: 484-5161/FTS: 676-5161

11. OFFICIAL REPRESENTATIVE (*Signature*)
C. A. JOHANNESMEYER
By direction

12. DATE
27 MAR 1985

SECTION B FOR USE BY EFD

1. SCOPE OF SERVICES

2. DATE RECEIVED
5 April 1985

3. ESR NUMBER
U-5033

SECTION C INTERIM ENDORSEMENT

1. REMARKS
PLEASE NOTE ECD.

2. EST. COMPLETION DATE
31 JUL 1985

3. AUTHORIZED REPRESENTATIVE (*Signature*)
J. R. Bailey
J. R. BAILEY
By direction

4. DATE
12 APR 1985

SECTION D FINAL ENDORSEMENT

1. ENCLOSURE(S)
☐ DRAWINGS AND MAPS ☐ SPECIFICATIONS ☐ REPORT
☐ OTHER (*specify*)

2. EST. COST (*if applicable*)
$

3. AUTHORIZED REPRESENTATIVE (*Signature*)

4. DATE OF COMPLETION

COPY TO FAC; COMP; MAIN

R/S 26324

28 MAR 1985

ROUTING SLIP

	ACTION	INFO	INITIAL
BMO		✓	
ABMO		✓	
ADMIN			
F&A			
MAINT NCO			
M&R			
OPNS			
PROP			
UMACS			
UTIL	✓		GSJ
SECRETARY			

COMMENTS:

An ESR was sent to Public Works prior to receiving this letter GSJ

Funding # 60,000 EIP

UNITED STATES MARINE CORPS
Marine Corps Base
Camp Lejeune, North Carolina 28542-5001

6280/4
FAC
28 MAR 1985

From: Assistant Chief of Staff, Facilities, Marine Corps Base, Camp Lejeune
To: Base Maintenance Officer

Subj: CAMP GEIGER SEWERAGE STUDY

Ref: (a) Meeting btwn Messrs. Johnson, Price, and Davis, Utilities Branch, BMain and Mr. Alexander, EnvEngr, AC/S, Fac on 11 Jan 85

Encl: (1) Draft Scope of Work

1. The enclosure is forwarded for your use in preparing an Engineering Service Request (ESR) for completion of the subject study. Recommend your review address the work tasks descriptions for manhole flow measurements and smoke testing of sewage laterals.

2. FY 85 funding for this study in the amount of $10,000 has been provided by HQMC and will be forwarded to LantDiv on request. Work tasks should be funded in the order of priority shown on the enclosure.

3. Request that the ESR, when drafted, be forwarded to the Public Works Officer via this office. For questions or comments, please contact Mr. Alexander, Extension 3034.

B. W. ELSTON

Copy to:
CO, MCAS(H)NR (S-4)
NREAD
EnvEngr

DRAFT SCOPE OF WORK

CAMP GEIGER SEWERAGE INFLOW/INFILTRATION (I/I) STUDY

I. Study Objectives

A. Determine the extent of the I/I problem.

B. Locate sections of the sewerage system having the most serious I/I problem.

C. Recommend I/I corrective measures.

D. Prepare cost estimate for corrective measures.

II. Work Tasks (in priority order)

A. Task 1. Evaluate sewage flows recorded at the Camp Geiger sewage treatment plant (STP) for calendar years 1982, 1983, and 1984. Determine base flow and population served by the plant. Relate the base flow to the population served and to wet weather peak flows. Describe the rate at which the volume of sewage influent at the STP increases in relation to rainfall events. Describe the location of sewage bypass structures in the sewerage system and summarize the frequency of bypasses for the above years (sewage flow and rainfall records will be provided by MCB).

B. Task 2. Conduct manhole flow measurements at the STP influent and four locations (see attached map). Obtain flow readings of base flow and peak flows (during storm events) at the STP and four locations, (1) pumping station AS-629, (2) interceptor line east of "G" Street near the "gas area," (3) interceptor line proceeding east from interaction of "F" and Fourth Streets, (4) interceptor line running east near structure number S-1212. Coordinate flow measurements with Camp Lejeune POC (sewerage system maps will be provided by MCB).

C. Task 3. Smoke test sewer laterals and trunk lines for obvious crushed line and/or inflow sources in the area bounded on the north by First Street, south by Fourth Street, east by "F" Street, and west by Church Street.

D. Task 4. Smoke test sewer laterals and trunk lines in the Camp Geiger Trailer Park area bounded by Curtis Road, Hawkins Boulevard, Bonnyman Street, and Robert L. Wilson Boulevard to include the entire length of Epperson Street.

E. Task 5. Recommend corrective measures with cost estimate for problems to be incorporated into a Marine Corps funded Pollution Abatement problem, as needed. Identify repair measures and locations which are feasible for implementation by MCB personnel.

F. Task 6. As needed, develop an outline for further infiltration studies to include the requirement and cost estimate for inspection of sewerage system.

ENCLOSURE (1)

TO: P&E — SANDY PS COPY TO Utilities

RUTH ESR FILE 651

ENGINEERING SERVICE REQUEST (ESR)
NAVFAC 11000/7 (4-78)
Supersedes NAVDOCKS 2038
S/N 0105-LF-010-0035

Instructions on Reverse

Copy No. Base

SECTION A FOR USE BY REQUESTER

1. FROM (Activity and location)
Commanding General, Marine Corps Base, Camp Lejeune, NC 28542

2. TO
Commander, Atlantic Division, Naval Facilities Engineering Command, Norfolk, VA

3. REFERENCE(S)

4. ESR IDENTIFICATION NUMBER (if applicable)
6E85

5. ENCLOSURE(S) (check)
☐ NAVCOMPT 140
☐ NAVCOMPT 2038
☐ NAVCOMPT 372
☒ OTHER (specify) See next page

6. TYPE OF FUNDING (check)
☐ O&MN
☒ OTHER (specify) O&MNC
☐ NIF
☐ NAF

7. TYPE OF SERVICES REQUESTED
Slate and select A&E Firm and negotiate A&E contract for work described herein.

8. DESIRED COMPLETION DATE

9. DESCRIPTION OF WORK
I. GENERAL: Engineering Services are required to develop a feasibility study and preliminary plans and cost estimate for monitoring of water and sewage treatment systems and related equipment.

II. BACKGROUND: The existing systems are manually controlled.

10. FOR INFORMATION CONSULT (Name and phone)
A. E. YOUNG
FTS 676-2658

11. OFFICIAL REPRESENTATIVE (Signature)
C. A. JOHANNESMEYER
By direction

12. DATE
19 MAR 1985

SECTION B FOR USE BY EFD

1. SCOPE OF SERVICES

2. DATE RECEIVED

3. ESR NUMBER

SECTION C INTERIM ENDORSEMENT

1. REMARKS

2. EST. COMPLETION DATE

3. AUTHORIZED REPRESENTATIVE (Signature)

4. DATE

SECTION D FINAL ENDORSEMENT

1. ENCLOSURE(S)
☐ DRAWINGS AND MAPS ☐ SPECIFICATIONS ☐ REPORT
☐ OTHER (specify)

2. EST. COST (if applicable)
$

3. AUTHORIZED REPRESENTATIVE (Signature)

4. DATE OF COMPLETION

COPY TO (w/o encls)
FAC; COMP; MAIN

III. DETAILS OF WORK:

a. Investigate the feasibility of monitoring the entire water and wastewater system via a computer system.

b. The enclosure should be used for guidance in development of a system. Provide a cost estimate per point, as well as overall system cost.

c. Compare cost of signal transmission via phone lines or radio waves.

d. Investigate utilizing the existing UMACS computer system as the main frame with remotes located at various plants, or should the system be designed utilizing small microcomputers located at individual plants with communication between themselves via modems utilizing the existing telephone system.

e. Deliverable: Provide cost estimate of each monitoring point and of the overall system by utilizing the existing utility monitoring computer system and by utilizing distributed monitoring network.

f. Special Requirements: The cost estimates and cost comparisons including preliminary plans will be reviewed at this activity at 35% and 90%. A pre-engineering study conference should be scheduled at this activity prior to commencement of work. Three copies of each type of cost estimates and plans will be required with each submission.

IV. FUNDS AVAILABLE: Funds are available and will be provided upon notification of negotiated contract. The contract amount is limited to $60,000.

V. POINT OF CONTACT: Mr. A. E. Young, Electrical Section, Public Works Division, FTS: 676-3658 or AV: 484-3658.

- -

Encl: (1) Monitoring Requirements List

T-6280

6280
MAIN
18 MAR 1985

From: Base Maintenance Officer, Marine Corps Base, Camp Lejeune
To: Assistant Chief of Staff, Facilities, Marine Corps Base, Camp Lejeune

Subj: SCOPE OF WORK FOR HAZARDOUS MATERIAL/WASTE (HM/W) AND USED OIL MANAGEMENT STUDY

Ref: (a) Your ltr 6280/2 FAC of 11 Mar 85

1. The reference has been reviewed and the following comments are provided:

a. Construction Contract N62470-84-C-7804, Disposal of Waste Oil, Building BB-9 is under construction to provide tanks and pumping stations to store and separate oil so that it can be burned in the boiler plant.

b. Construction Contract N62470-81-B-1464, Replace Boilers and Fuel Storage Tanks, will be awarded this spring. Under this contract, Boiler No. 9 will be replaced at Building BB-9. This boiler will be used to burn waste oil.

c. The reference should be modified to address the handling and burning of waste oil at BB-9. The modifications should include the following points:

(1) Recommended fuel firing rates.

(2) Review of plans and specifications, and recommended modifications/additions.

(3) Quality Control Procedures: Are any necessary, and recommendations?

(4) Should waste oil be blended with No. 6 oil or should a separate burner be installed?

(5) Is monitoring of waste oil viscosity necessary, and if so, how?

Subj: SCOPE OF WORK FOR HAZARDOUS MATERIAL/WASTE (HM/W) AND USED OIL MANAGEMENT STUDY

2. Point of contact for additional information is J. Johnson, 451-5161.

F. E. CONE
Acting

Blind copy to:
STIL
ContFile

ESR

6280
MAIN
14 Mar 85

From: Director, Utilities Branch
To: Director, Operations Branch

Subj: SCOPE OF WORK FOR HAZARDOUS MATERIAL/WASTE (HM/W) AND USED OIL MANAGEMENT STUDY

Ref: (a) LANTDIV Proposed Scope of Work, rec'd 28 Feb 85

1. Construction Contract N62470-84-C-7804, Disposal of Waste Oil, Building BB-9 is under construction to provide tanks and pumping stations to store and separate oil so that it can be burned in the boiler plant.

2. Construction Contract N62470-81-B-1464, Replace Boilers and Fuel Storage Tanks, will be awarded this spring. Under this contract, Boiler No. 9 will be replaced at Building BB-9. This boiler will be used to burn waste oil.

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b. Review of plans and specifications, and recommended modifications/ additions.

c. Quality Control Procedures: Are any necessary, and recommendations?

d. Should waste oil be blended with No. 6 oil or should a separate burner be installed?

e. Is monitoring of waste oil viscosity necessary, and if so, how?

G. S. JOHNSON, BR.

Writer/Typist USJohnson
Date Typed 4/14/85
Word Processor Number

Word Processor Number
Date Typed 4/19/85

UNITED STATES MARINE CORPS
Marine Corps Base
Camp Lejeune, North Carolina 28542-5001

6280/2
FAC
11 MAR 1985

From: Assistant Chief of Staff, Facilities, Marine Corps Base, Camp Lejeune

Subj: SCOPE OF WORK FOR HAZARDOUS MATERIAL/WASTE (HM/W) AND USED OIL MANAGEMENT STUDY

Ref: (a) Mtr btwn N.C. Solid and Hazardous Waste Management Branch, DPDS, LANDIV, and MCB Staff dtd 30 Jan 85

Encl: (1) LANTDIV Proposed Scope of Work, rec'd 28 Feb 85

1. The reference reaffirmed the need for a comprehensive study of this subject and agreed the HM/W and used oil issues were to be jointly studied.

2. Request your review of the enclosure and comments be provided no later than 20 March 1985. Negative replies are requested. If you have lengthy suggestions, please meet with us to develop a marked-up Scope of Work for return to LANTDIV in a timely manner.

3. Point of contact for this study is Mr. Bob Alexander at extension 3034/5.

B. W. ELSTON
Dep, AC/S, Facilities

DISTRIBUTION:
DPDO
PWO
BMO
Dir,NREAD
EnvEngr

Rec'd 28 Feb 85
A

SCOPE OF WORK
FOR HAZARDOUS WASTE/MATERIALS AND USED OIL
MANAGEMENT STUDY

I. INTRODUCTION

Objective

The purpose of this contract is to provide for an engineering study of hazardous material/waste (HM/HW) and used oil management practices at Marine Corps Base Camp Lejeune. The study will recommend facilities and management procedures for ensuring compliance with oil pollution and HM/HW regulations and maximum beneficial utilization of recoverable used oils and HM/HW. As used in this scope, the term "used oil" is meant to include all lubricants, fuel oils and other petroleum-based wastes. HW as used in this scope is defined as in 40 CFR 261. HM are chemicals that pose a health hazard in their use, storage, or transportation or are HW which are being reused or recycled. The contractor shall be required to provide an evaluation of feasible alternatives for the collection, treatment, and disposal or utilization of HM/HW and used oils; develop separate HM/HW and used oil management plans; documentation for a military construction project to build recommended facilities; and an interim plan for managing HM/HW and used oils until required facilities can be built and/or management procedures implemented.

Background

Various local, state, and Federal regulations, most notably the Resource Conservation and Recovery Act and the Clean Water Act, have placed severe restrictions on the discharge of HM/HW and oils to the environment. In compliance with these requirements, the Marine Corps is modifying facilities to abate HM/HW and oil discharges and to provide source separation, processing and storage of these wastes prior to reuse or disposal. Facilities are required to receive, treat, and store or dispose of these wastes. It is intended that these facilities, together with modifications to existing management procedures, will provide a comprehensive program for cost-effective compliance with environmental regulations.

Contract Requirements and Scope of Work

The Contractor shall be required to:

a. Review previous studies on HM/HW and used oil handling at MCB, Camp Lejeune and outlying fields and evaluate the current applicability of study findings and recommendations. Copies of previous reports will be furnished by the Government. (e.g. ESR U5020)

b. Identify sources and points of generation of HM/HW and used oil, and document volumes, frequency of generation, and characteristics by updating existing inventories. Field visits must be made to all sources. Waste streams must be sampled, and generation rates measured where necessary to provide information on waste stream composition. The government will provide data on generation rates and characteristics of HM/HW sales records. Study results shall be presented in both graphical and narrative form for each major waste stream.

c. Document Federal, state, and local regulations and Department of Defense instructions governing the handling, disposal, and reuse of HM/HW and used oil. The government will furnish copies of applicable DOD/ Navy Department instructions and policy statements.

d. Review and document existing facilities and practices for the management of HM/HW and used oils. Facilities under construction or in the planning stage must be reviewed and documented. Reviews must include, but not be limited to, an evaluation of:

1. Waste reduction, segregation, and reuse practices.

2. Plans and process flow diagrams of all collection, treatment, and disposal systems.

3. Operations and maintenance procedures.

4. Personnel staffing and training.

5. System costs and revenue generated by the sales of recovered used oils and HM/HW.

6. Management responsibilities.

7. Minimization of the various types of HM (particulary solvents) used for the same operations.

e. Determine the most feasible and economical system for the collection, treatment, and disposal or reuse of HM/HW and used oil from activity operation considerations:

1. Compliance with applicable Federal, state, and local regulations.

2. Impact on present and future operations.

3. Capital, recurring operations and maintenance, and life cycle costs.

4. Beneficial utilization of recovered HM/HW and used oils, with emphasis on use of waste fuel oils as fuel supplements and the re-refining of used lube oils for reuse as lube oils, and the reuse of HW as HM.

5. Joint ventures with other Federal or commercial organizations.

f. All assumptions made in evaluating alternatives must be fully documented. A sensitivity analysis must be conducted to determine the continued attractiveness of the selected system with changes in factors influencing the decision. Examples of the factors to be included in the sensitivity analysis are future variations in the price of recoverable HM and oils and virgin petroleum products, and possible errors in the estimation of HM/HW, and used oil generation rates.

g. Prepare project documentation for facilities required by the selected system. The emphasis shall be on optimal utilization of existing facilities. New facilities will be funded by USMC O&M pollution abatement, MILCON, or minor local construction funds. Construction options shall be presented in various combinations of funding categories for budgeting flexibility. All local construction alternatives should provide the minimum of new facilities construction. Documentation shall be submitted on DD Form 1391. This shall be in accordance with: (1) MCO P11000.5E or OPNAVINST 11010.1C for minor construction projects, or (2) NAVFACINST 11010.32E, "Preparation of Supporting Document for Proposed Military Construction Program Projects." Economic analyses shall conform to NAVFAC P-422, "Economical Analysis Manual." Submittals must emphasize, but need not be limited to:

1. Project life cycle costs, including capital and recurring operations and maintenance costs.

2. Conceptual plans, design flows, effluent quality, schematic drawings, and related flow diagrams for all collection, treatment, and disposal or reuse systems, including existing facilities. These plans should be segregated into individual units by building and/or shop organization as well as master collection systems.

3. Required modifications to existing facilities.

4. Descriptions of major collection, treatment, and disposal or reuse components (i.e., pumps, separators, piping systems, etc.), to include useful life projections and efficiencies of existing facilities.

5. Operating and maintenance requirements, including number and qualifications of personnel required to operate and maintain the systems comparative to existing provisions.

6. Collaterial equipment required (i.e., trucks, portable tanks, etc.) and their functions.

7. Methods for disposing of treated wastewater, used oils, HM/HW, and treated residues.

h. Develop separate used oil and HM/HW managemnt plans. The plans shall establish procedures and responsibilities for ensuring compliance with oil pollution and HM/HW regulations and maximum beneficial utilization of recovered oils, fuels and HM. Plans must include, but not be limited to:

1. Regulatory compliance requirements.

2. Existing collection, treatment, and disposal or reuse practices, with a description of command responsibilities for each step.

3. Facilities, equipment, personnel, and procedures required for comprehensive HM/HW and used oil management programs, including command responsiblities and logistical support.

4. Implementation plans and schedules for instituting the recommended management programs, as well as interim practices to be utilized until the recommended program can be fully implemented and the required facilities can be constructed.

5. Revised oil spill prevention control and countermeasures (SPCC) and HM/HW/oil spill contingency plans.

Contract Scheduling

Prestudy meeting	30 days after contract award
Submittal of work plan and schedule	15 days after contract award
Preliminary Reports	180 days after contract award
Final report	30 days after approval of draft report

I. Submittals

7 Copies of the Preliminary Report
5 to Marine Corps Base, Camp Lejeune
2 to LANTNAVFACENGCOM Code 114

Same Distribution For Final Report

Atlantic Division, Naval Facilities Engineering Command Points of Contact

Project Manager - M. Bryant, P.E., Code 09A21B3
Waste Oils - Mr. Paul B. Parker, Code 114
HM/HW - Mr. Steve A. Brewer, Code 114

II. ACTIVITY POINTS OF CONTACT

A. Oily Waste Study

Mr. Thomas H. Hankins, P.E.
Manager, Mechanical Section, Design Branch
Public Works Division

Marine Corps Base
Camp Lejeune, NC 28542-5001
A/V 484-3238 or COMM (919) 451-3228

B. HM/HW Study

Mr. Robert Alexander, Envrionmental Engineer
Office of Assistant Chief of Staff, Facilities
Marine Corps Base
Camp Lejeune, NC 28542-5001
A/V 484-3034, COMM (919) 451-3034

Mr. Carl Baker, Manager
Civil Section, Public Works Division
Marine Corps Base
Camp Lejeune, NC 28542-5001
A/V 484-3238, COMM (919) 451-3238

11300
MAIN
5 Mar 85

From: Base Maintenance Officer, Marine Corps Base, Camp Lejeune
To: Public Works Officer, Marine Corps Base, Camp Lejeune

Subj: REQUEST FOR ENGINEERING SERVICES

Encl: (1) ESR, Monitoring of Water and Wastewater Treatment Systems

1. The enclosure is forwarded for appropriate action.

G. S. JOHNSON, JR.
By direction

Blind copy to:
OpnsBr

Writer / Typist GSJ/ahn
Date Typed 5 Mar 85
Word Processor Number _____

Writer / Typist _____
Date Typed _____
Word Processor Number _____

ENGINEERING SERVICE REQUEST
Monitoring of Water and Wastewater Treatment Systems

I. General. Provide an engineering study to investigate the feasibility of monitoring the Water and Wastewater Systems aboard Camp Lejeune.

II. Background:

a. Presently Camp Lejeune is served by eight water treatment plants with a combined capacity of producing 13,700,000 gallons of potable water per day. The base is also served by seven wastewater treatment plants with a combined capacity of treating 13,095,000 gallons of wastewater per day.

b. A large percentage of the systems operations is accomplished manually. Examples of this are turning on and off wells by hand, sampling by hand, and filling of elevated tanks by overflowing. At this time, there is not any assistance gained by the use of computerization.

III. Details of Work:

a. Investigate the feasibility of monitoring the entire water and wasterwater system via a computer system.

b. The attached list of points should be used for guidance in development of a system. Provide a cost estimate per point as well as overall system cost.

c. Compare cost of signal transmission via phone lines or radio waves.

d. Investigate, utilizing the existing UMACS computer system as the main frame with remotes located at various plants or should the system be designed utilizing small microcomputers located at individual plants with communication between themselves via modems utilizing the existing telephone system.

e. Provide preliminary drawings and cost estimate sufficient to develop a project for submission.

IV. Funds Available. FY 85 Special O&M Funds in the amount of $60,000 are available for this study.

V. Point of Contact. Mr. G. S. Johnson or Mr. David Southerland, extension 5161.

Encl (1)

Monitoring Requirement

Hadnot Point Wastewater System

Plant, BLDG #22

A. Digestor area for presence of Methane, Hydrogen Sulfide gas and Oxygen content. (Alarm)

B. Chlorinator room for presence of Chlorine gas. (Alarm)

C. Pump on/off status (4) pumping stations Bldg #21, (4) Bldg #680 and (2) secondary return pumps, (2) filter pumps.

D. Intrusion (Alarm)

E. Power failure (Alarm)

F. Generator failure (Alarm)

G. Digester temperature (6)

Influent

A. P.H.

B. Flow

C. Turbidity

Effluent

A. Dissolved oxygen

B. P.H.

C. Chlorine residual

D. Turbidity

E. Flow

Lift Station, BLDG # S-1761, S-1776, S-1855, S-1055, S-702, S-PT-41, S-34, S-85, H-29, S-47, S-47A, S-1948, S-2633, S-2100, NH-110, S-865 H. Schl, S-46, S-672, LCH-4005, SFC-116, SFC-315, SFC-599, SFC-260, SFC-203, GP-22, S--1455, No number Ord. Pk.

A. Power failure (Alarm)

B. Generator failure (Alarm) BLDG # S-1761, S-1776, S-85, H-29, S-47A, S-1948, S-2633, S-2100, S-46, S-672, LCH-4005, SFC-315, SFC-203

C. Pump on/off status, two pumps in each building.

D. High level (Alarm)

E. Methane, Hydrogen Sulfide gas and Oxygen content. (Alarm)

F. Intrusion (Alarm)

(Continued)

Water/Oil Seperator Structure # S-1854, S-918, S-1450, S-1747, S-1456, no number-near S-1808, no number-near S-1739, SFC-117, no number-near SGP-17

A. Power failure (Alarm)

B. Pump on/off status, two pumps each

C. High level (Alarm)

Monitoring Requirement

Tarawa Terrace Wastewater System

Plant, BLDG TT-35

A. Digestor area for presence of Methane, Hydrogen Sulfide gas and Oxygen content. (Alarm)
B. Chlorine room for presence of Chlorine gas. (Alarm)
C. Pump on/off status, (3) influent pumping stations, (2) secondary return pumps, (2) filter pumps.
D. Intrusion (Alarm)
E. Power failure (Alarm)
F. Generator failure (Alarm)
G. Digestor temperature (2)

Influent

A. P.H.
B. Flow
C. Turbidity

Effluent

A. Dissolved oxygen
B. P.H.
C. Chlorine residual
D. Turbidity
E. Flow

Lift Station, BLDG # TT-32, TT-33, TT-34

A. Power failure (Alarm)
B. Generator failure (Alarm)
C. Pump on/off status, two pumps in each building
D. High level (Alarm)
E. Methane, Hydrogen Sulfide gas and Oxygen content. (Alarm)
F. Intrusion (Alarm)

Monitoring Requirement

Camp Johnson Wastewater System

Plant, BLDG M-136

A. Chlorine room for presence of Chlorine gas (Alarm)
B. Pump on/off statue (2) filter pumps and (2) return pumps.
C. Power failure (Alarm)
D. Generator failure (Alarm)
E. Intrusion (Alarm)

Influent

A. P.H.
B. Turibidity
C. Flow

Effluent

A. Dissolved oxygen
B. P.H.
C. Chlorine residual
D. Turbidity
E. Flow

Lift Station, BLDG # M-SE-23, M-SE-241

A. Power failure (Alarm)
B. Generator failure (Alarm)
C. Pump on/off status, two pumps in each building.
D. High level (Alarm)
E. Methane, Hydrogen Sulfide gas and Oxygen content. (Alarm)
F. Intrusion (Alarm)

Water/Oil Seperator Structure # SM-187

A. Power failure (Alarm)
B. Pump on/off status, two pumps each
C. High level (Alarm)

Monitoring Requirement

Camp Geiger Wastewater System

Plant, BLDG TC-563

A. Digestor rooms for presence of Methane, Hydrogen Sulfide gas and Oxygen content.
B. Chlorine room for the presence of Chlorine gas.
C. Pump on/off status on (2) pond pumps, (2) filter pumps, (2) return pumps, tertiary effluent pumps (2), plant discharge pumps (2).
D. Power failure (Alarm)
E. Generator failure (Alarm)
F. Digestor temperature (2)
G. Intrusion (Alarm)

Influent

A. P.H.
B. Turbidity
C. Flow

Effluent

A. Dissolved oxygen
B. P.H.
C. Chlorine residual
D. Turbidity
E. Flow

Lift Station, BLDG # AS-4040, AS-1001, AS-517, AS-426, AS-230, AS-629, AS-606, AS-850, AS-902, AS-2001, AS-2808, AS-4125, AS-4147, AS-206, SAS-3526

A. Power failure (Alarm)
B. Generator failure (Alarm) BLDG # AS-1001, AS-230, AS-629, AS-606, AS-850, AS-2001, AS-4125, AS-206.
C. High level (Alarm)
D. Pump on/off status two pumps in each building.
E. Methane, Hydrogen Sulfide gas and Oxygen content. (Alarm)

Water/Oil Seperator

A. Power failure (Alarm)
B. Pump on/off status
C. High level (Alarm)

Monitoring Requirement

Rifle Range Wastewater System

Plant, BLDG # RR-92

A. Chlorine room for presence of Chlorine gas. (Alarm)

B. Pump on/off status, (2) filter pumps and (2) return pumps.

C. Power failure (Alarm)

D. Generator failure (Alarm)

E. Intrusion (Alarm)

Influent

A. P.H.

B. Turbidity

C. Flow

Effluent

A. Dissolved oxygen

B. P.H.

C. Chlorine residual

D. Turbidity

E. Flow

Lift Station, BLDG # RR-52, SRR-60

A. Power failure (Alarm)

B. Generator failure (Alarm) BLDG RR-52

C. High level (Alarm)

D. Pump on/off status, two pumps in each building

E. Methane, Hydrogen Sulfide gas and Oxygen content. (Alarm)

F. Intrusion (Alarm)

Monitoring Requirement

Courthouse Bay Wasterwater System

Plant, BLDG #BB-4

A. Chlorine room for presence of Chlorine gas. (Alarm)
B. Pump, on/off status, 3 filter pumps, 2 return pumps.
C. Equalization pond pumps (2) compressors, (2).
D. Power failure (Alarm)
E. Generator failure (Alarm)
F. Intrusion (Alarm)

Influent

A. Dissolved oxygen
B. P.H.
C. Turbidity
D. Flow

Effluent

A. Dissolved oxygen
B. P.H.
C. Chlorine Residual
D. Turbidity
E. Flow

Lift Stations, BLDG #BB-1, SA-38

A. Power failure (Alarm)
B. Generator failure (Alarm)
C. High level (Alarm)
D. Pump on/off status two pumps each building.
E. Methane, Hydrogen Sulfide gas and Oxygen content. (Alarm)
F. Intrusion (Alarm)

Water/Oil seperator BLDG #S-6-A, S-6-B

A. Power failure
B. Pump on/off status
C. High level (Alarm)

Monitoring Requirement

Onslow Beach Wastewater System

Plant, BLDG SBA-127

A. Chlorine room for presence of Chlorine gas (Alarm)
B. Pump on/off status on (2) filter pumps, (2) return pumps.
C. Power failure (Alarm)
D. Generator failure (Alarm)
E. Intrusion (Alarm)

Influent

A. P.H.
B. Turbidity
C. Flow

Effluent

A. P.H.
B. Dissolved oxygen
C. Chlorine residual
D. Turbidity
E. Flow

Lift Stations BLDG # SBA-116, SBA-197, SBA-198, SBA-160

A. Power failure (Alarm)
B. Generator failure (Alarm)
C. Pump on/off status, two pumps in each building.
D. High level (Alarm)
E. Methane, Hydrogen Sulfide gas and Oxygen content (Alarm)
F. Intrusion (Alarm)

Monitoring Requirement

Marine Corps Air Station Water Treatment Plant

MCAS - 110

1. Raw Water Booster Pumps on and off and hours run plus control.
2. High lift pumps on and off and total hours run and control.
3. Generator status.
4. Power failure.
5. Intrusion alarm for all tanks, plant and reservoirs.
6. Chlorine alarm.
7. Distribution pressure - 4 points throughout distribution system.
8. Filter flow and total hours run for filters and turbidity each filter.
9. All wells status on and off and ability to cut on and off and total hours run. (each well)

FLOW

1. Raw water in g. p. m.
2. Treated water in g.p.m.
3. Distribution water in g.p.m. divided to MCAS and Camp Geiger (Flow to each area).

LEVELS

1. AS-108
2. AS-107 Treated water levels - low and high level alarm and foot levels (intrusion).

ELEVATED TANKS

1. AS-310
2. AS4130 Low and high level alarms and foot levels (Intrusion alarm).

CHEMICAL ANALYSIS

Raw	Treated	Delivered
1. Fluoride	1. Chlorine	1. Hardness
2. Hardness	2. Turbidity each filter	2. p.H.
3. p.H.	3. Hardness	3. Turbidity
4. Iron	4. p.H.	4. Chlorine
	5. Stability	5. Fluoride
	6. Iron	6. Iron
		7. Stability

MOQ - 2002

Reservoir level, low and high level and foot level - intrusion alarm

Pumping station intrusion alarm MOQ-2003

Pumps on and off and status and control and total hours run

Chlorine, hardness, p.H., turbidity, fluoride, iron and stability monitored at this pump station

Distribution pressure

Power Failure

TC-501 Pumping Station

1. Power failure (alarm)
2. Chlorine alarm.
3. Plant intrusion (alarm).
4. Highlift pumps on and off and control and total hours run.
5. Distribution pressure - 4 points throughout distribution system.

FLOW

1. Delivered water flow in g.p.m.

LEVELS

1. STC-500
2. STC-509 Low and high levels alarms and foot levels, intrusion.

ELEVATED TANKS

1. STC-616
2. STC-1070 Low and high levels alarms and foot levels, intrusion.

Chlorine, hardness, p.H., turbidity, fluoride, iron, and stability monitored at this station.

Monitoring Requirement

Holcomb Boulevard Water Treatment Plant

Plant, Bldg. 670

1. Power failure alarm.
2. All well status on or off and control and total hours run (each well)
3. High lift pumps status on or off and control and total hours run.
4. Filter flow and total hours run.
5. Generator status.
6. Chlorine alarm.
7. Plant intrusion alarm.
8. Distribution pressure - 4 points throughout distribution system.

FLOW

1. Raw water influent in g.p.m.
2. Treated water in g.p.m.
3. Distribution water in g.p.m.

LEVELS

1. S-671 Treated water reservoir low and high level alarms and foot level plus intrusion alarm.

ELEVATED TANKS

1. S-830
2. S-2323 Low and high level alarm and foot levels (Instrusion alarms)
3. SLCH-4004

CHEMICAL ANALYSIS

RAW

1. Chlorine
2. Hardness
3. Iron
4. p.H.

TREATED

1. Turbidity each filter
2. Hardness
3. p.H.
4. Chlorine
5. Iron

DELIVERED

1. Hardness
2. p.H.
3. Turbidity
4. Chlorine
5. Fluoride
6. Iron

Monitoring Requirement

Hadnot Point Water Treatment Plant

Plant, Bldg. 20

1. Power failure alarm.
2. All wells status on and off and ability to cut on and off and total hours run. (each well)
3. High lift pumps status on or off and control and total hours run.
4. Raw water booster pumps, on or off and control and total hours run.
5. Filter flow and total hours run.
6. Generator status.
7. Chlorine alarm.
8. Plant intrusion alarm.
9. Distribution pressure - 4 points throughout distribution system.

FLOW

1. Raw water influent g.p.m.
2. Treated water flow in g.p.m.
3. Delivered water flow in g.p.m.

LEVELS

1. Raw water reservoir, B-20, low and high level alarm and foot reading (intrusion alarm).
2. Treated water reservoirs, S-735 low and high level alarm and foot reading (intrusion alarm).
3. Treated water reservoir S-736 low and high level alarm and foot reading (intrusion alarm).

ELEVATED TANKS

1. S-5
2. S-29 Low and high level alarm and foot levels (Intrusion alarm)
3. S-1000
4. SFC-314

CHEMICAL ANALYSIS

RAW

1. Chlorine
2. Hardness
3. Iron
4. p.H.

TREATED

1. Turbidity each filter
2. Hardness
3. p.H.
4. Chlorine
5. Iron

DELIVERED

1. Hardness
2. p.H.
3. Fluoride
4. Iron
5. Chlorine
6. Turbidity

Monitoring Requirement

Rifle Range Water Treatment Plant

Plant, Bldg. RR-85

1. High lift pumps on and off and control and total hours run.
2. Filter pumps on and off and control and total hours run.
3. All well status on and off and control and total hours run. (each well)
4. Power failure.
5. Intrusion alarm all reservoirs, tanks and plant.
6. Chlorine alarm.
7. Distribution pressure - 4 points throughout distribution system.
8. Filter flow and turbidity each filter plus total hours run.
9. Softner hardness plus total hours run.

FLOW

1. Raw water in g.p.m.
2. Treated water in g.p.m.
3. Delivered water in g.p.m.

LEVELS

1. SRR-86 Treated water levels - low and high level and foot levels (Intrusion alarm)
2. Detention tank - low and high level and foot levels and alarm.

ELEVATED TANK

1. SRR-44 Low and high level and alarms and foot levels, intrusion alarm.

CHEMICAL ANALYSIS

RAW	TREATED	DELIVERED
1. Hardness	1. Chlorine	1. Hardness
2. Iron	2. Iron	2. Iron
3. p.H.	3. Turbidity each filter	3. Chlorine
	4. p.H.	4. Turbidity
	5. Chloride	5. Chloride
	6. Hardness	6. p.H.

Monitoring Requirement

Courthouse Bay Water Treatment Plant

Plant, Bldg. BB-190

1. High lift pumps on and off and control and total hours run.
2. Filter pumps on and off and control and total hours run.
3. All well status on and off and control and total hours run (each well).
4. Power failure.
5. Intrusion alarm.
6. Chlorine alarm
7. Distribution pressure - 4 points throughout distribution system (A-5 one area)
8. Filter flow and turbidity each filter plus total hours run.
9. Softner hardness plus total hours run

FLOW

1. Raw water in g.p.m.
2. Treated water flow in g.p.m.
3. Delivered water in g.p.m.

LEVELS

1. SBB-191 Treated water level, low and high level alarm and foot levels, intrusion.
2. Detention tank - low and high level alarm and foot levels.

ELEVATED TANK

1. SBB-25 Low and high level and foot levels and intrusion alarm.

CHEMICAL ANALYSIS

RAW

1. Hardness
2. Iron
3. p.H.

TREATED

1. Chlorine
2. Iron
3. Turbidity each filter
4. p.H.
5. Chloride
6. Hardness

DELIVERED

1. Chlorine
2. Iron
3. Turbidity
4. p.H.
5. Chloride
6. Hardness

Monitoring Requirement

Onslow Beach Water Treatment Plant

Plant, Bldg. BA-138

1. High lift pumps on and off and control and total hours run.
2. All wells on and off and control and total hours run.
3. Power failure.
4. Intrusion alarm.
5. Chlorine alarm.
6. Distribution pressure - 4 points throughout distribution system.
7. Filter flow and turbidity each filter and total hours run.
8. Softner hardness and total hours run.

FLOW

1. Raw water in g.p.m.
2. Treated water in g.p.m.
3. Delivered water in g.p.m.

LEVELS

1. SBA-139 Water level in feet and high and low level alarm and intrusion.

ELEVATED TANK

1. SBA-108 Water level in feet and high and low alarm and intrusion.

CHEMICAL ANALYSIS

RAW

1. Hardness
2. Iron
3. p.H.

TREATED

1. Chlorine
2. Iron
3. Turbidity each filter
4. p.H.
5. Chloride
6. Hardness

DELIVERED

1. Chlorine
2. Iron
3. Turbidity
4. p.H.
5. Chloride
6. Hardness

Monitoring Requirement

Tarawa Terrace Water Treatment Plant

Plant, Bldg. TT-38

1. Power failure alarm.
2. All wells on or off status and control and total hours run (each well).
3. High lift pumps on or off status and control and total hours run.
4. Chlorine alarm.
5. Plant intrusion alarm.
6. Distribution pressure - 4 points throughout distribution system.
7. Filter flow and total hours run each filter.

FLOW

1. Raw water influent in g.p.m.
2. Treated water in g.p.m.
3. Distribution water in g.p.m.

LEVELS

1. STT-39 Treated water reservoir low and high level alarm plus foot levels and intrusion alarm.

ELEVATED TANKS

1. STT-40 Low and high level alarms plus foot levels and intrusion alarm.

CHEMICAL ANALYSIS

RAW

1. Chlorine
2. p.H.
3. Iron
4. Hardness

TREATED

1. Chlorine
2. Hardness
3. Turbidity each filter
4. p.H.
5. Iron

DELIVERED

1. Hardness
2. p.H.
3. Turbidity
4. Chlorine
5. Fluoride
6. Iron

Monitoring Requirement

Montford Point Water Treatment Plant

Plant, Bldg. M-178

1. Power alarm for failure.
2. All wells on or off status and control and total hours run (each well)
3. High lift pumps on or off status and control and total hours run.
4. Chlorine alarm.
5. Plant intrusion alarm.
6. Distribution pressure - 4 point throughout distribution system.
7. Softner control and hardness and total hours run.

FLOW

1. Raw water in g.p.m.
2. Treated water in g.p.m.
3. Delivered water in g.p.m.

LEVELS

1. SM-179 Treated water reservoir low and high level alarm and foot levels and intrusion alarm.

-TANKS

1. SM-624 - low and high level alarm and foot levels and intrusion alarm.

CHEMICAL ANALYSIS

RAW

1. Iron
2. p.H.
3. Hardness

TREATED

1. Chlorine
2. Iron
3. Turbidity
4. p.H.
5. Chloride
6. Hardness

DELIVERED

1. Hardness
2. Iron
3. Chlorine
4. Turbidit
5. Chloride
6. p.H.

Monitoring Requirements

Swimming Pools

Bldgs. 236, 540, PP-2615, M-139, TT-20, AS-204, AS-709

ALL SWIMMING POOLS WILL BE MONITORED FOR THE FOLLOWING

1. Intrusion
2. Power failure
3. Filter pump on and off and control and total hours run
4. Turbidity each filter and total hours run.
5. Temperature
6. Chlorine
7. p.H.
8. Stability
9. Flow

11345
MAIN
5 Mar 85

From: Base Maintenance Officer, Marine Corps Base, Camp Lejeune
To: Public Works Officer, Marine Corps Base, Camp Lejeune

Subj: REQUEST FOR ENGINEERING SERVICES

Encl: (1) ESR, Infiltration/Inflow Study of Camp Geiger Wastewater Treatment System

1. The enclosure is forwarded for appropriate action.

G. S. JOHNSON, JR.
By direction

Blind copy to:

OpnsBr

Writer: G. S. Johnson, Jr., Util, X5161
Typist: R. Norris, 5 Mar 85

ENGINEERING SERVICE REQUEST
Infiltration/Inflow Study of
Camp Geiger Wastewater Treatment System

I. General. Engineering services are required to locate the sources of storm water infiltration into the Camp Geiger Wastewater Treatment System.

II. Background. The Camp Geiger Wastewater Treatment System serves the Camp Geiger and MCAS(H), New River Areas. The designed capacity of the plant is sufficient for present needs. Provided excess storm water hydraulic loads can be abated.

III. Details of Work:

a. Evaluate sewage flows recorded at the Camp Geiger Treatment Plant for calendar years 1982, 1983 and 1984. Determine base flow and population served by the plant. Relate the base flow to the population served and wet weather peak flows.

b. Conduct manhole flow measurements in selected manholes prior to, and during a rainfall. Inspections of manholes should start at the upper locations and proceed down stream.

c. The pipe reaches suspected of having storm inflo should be examined for connections to storm water collecting areas utilizing maps and physical site inspections. Suspected areas can be smoke and dye tested. Where smoke tests will fail to indicate storm connections due to water traps, TV inspections should be done during rainstorms to locate and evaluate inflow points for grouting and/or reconstruction.

d. Provide recommended corrective measures and a cost estimate for correction.

IV. Funds Available. FY 85 Special O&M Funds in the amount of $50,000 are available for this study.

V. Point of Contact. Mr. G. S. Johnson or Mr. David Southerland, Base Maintenance Division, AV 484-5161 or FTS 676-5161.

2 [redacted] N 1985

ROUTING SLIP

	ACTION	INFO	INITIAL
BMO			
ABMO			
ADMIN			
F&A			
MAINT NCO			
M&R			
OPNS			
PROP			
UMACS			
UTIL	✓		
SECRETARY			

COMMENTS:

Submit projects accordingly. Need several projects.

FEC

NO PROJECTS

65J

RUTH, FILE

ROUTINE

R 141430Z JAN 85

FM CMC WASHINGTON DC

TO AIG EIGHT

XMT CG FOURTH MARDIV
MARFINCEN KANSAS CITY MO
MCAS H NEW RIVER NC
MCAF QUANTICO VA
CG FOURTH MAW
MCAS H TUSTIN CA
MCAS H FUTENMA JA

UNCLAS //N11000//

CMC//CODEXLFF-2/
SUBJ: FY85 SPECIAL ENGINEERING STUDY FUNDS

1. COMMENCING WITH POM 83, THIS HQ HAS SOUGHT SPECIAL FUNDING FOR ACTIVITY PECULIAR ENGINEERING STUDIES. IN FY81 ACTIVITIES SUBMITTED REQUIREMENTS WHICH TOTALED MORE THAN $2 MILLION. FOR FY85 WE HAVE AVAILABLE $300,000 FOR DISTRIBUTION.

2. STUDIES TO BE INCLUDED FROM THESE RESOURCES ARE THOSE THAT CANNOT RECEIVE SUPPORT FROM OTHER O&MMC SOURCES SUCH AS ENERGY CONSERVATION, FIRE PROTECTION/SAFETY, AND HAZARDOUS WASTE HANDLING OR FROM SPECIAL APPROPRIATIONS SUCH AS THE DOD ENVIRONMENTAL RESTORATION PROGRAM EXAMPLES OF INCLUDED STUDIES ARE:

A. STORM DRAINAGE REQUIREMENTS IN AN AREA SUSCEPTABLE TO FLOOD CONDITIONS AND ERROSION. Shoreline Stabiliz

B. AUTOMATED DATA PROCESSING OF ACTIVITY LONG RANGE MAINTENANCE PLANS.

C. CONTRACT FORMULATION OF ACTIVITY RECURRING MAINTENANCE AND CONTROLLED INSPECTION PROGRAMS

D. ACTIVITY TRAFFIC MOVEMENT CONTROL REALIGNMENT.

E. UTILITY DISTRIBUTION SYSTEM DEFICIENCY IDENTIFICATION.

F. ENGINEERING DATA ACCUMULATION IN SUPPORT OF ACTIVITY MILCON/NAFCON FACILITIES STUDIES

3. REQUEST YOU SUBMIT TO THIS HQ (LFF-2) A PRIORITIZED LISTING OF YOUR REQUIREMENTS FOR THESE STUDY FUNDS. INCLUDE IN RESPONSE

JAN 18 1985

FAC ROUTING
FACO

BFAC(2)...ACT FOR CG MCB CAMP LEJEUNE(11)
BADJ(4) BCOS(1) BMAO(1) BSDO(1) OICB(1) CEOB(1)

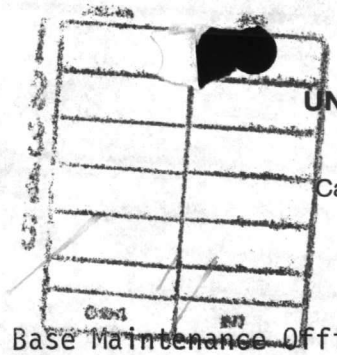
17000/-2/0369

RTD:053-000/COPIES:0011

DETAILED SCOPE AND JUSTIFICATION FOR REQUIREMENT. PROVIDE ROUGH COST ESTIMATE. WHERE AVAILABLE, INDIC IF CONTRACT ACCOMPLISHMENT WILL BE ACHIEVED THROUGH A SERVICING NAVFAC ENGINEERING FIELD DIVISION (EFD) AND INDIC IF EFD HAS RESPONDED TO AN ENGINEERING SERVICE REQQEST (ESR) ON THE STUDY. WHERE APPROPRIATE, INDIC PHASING OF REQUIREMENT INTO MORE THAN ONE FY.

4. YOUR RESPONSES WILL BE EVALUATED AND YOU WILL BE ADVISED OF THOSE PROJECTS SELECTED FOR INCLUSION IN FY85 PROGRAM. ADDITIONAL REQUIREMENTS ABOVE THOSE SUPPORTABLE IN FY85 WILL BE INCLUDED IN POM 87 SUBMISSIONS. REQUEST MSG RESPONSE NLT 17 FEB 85 WITH LOCAL POC WHO IS AUTH TO RESPOND TO INQUIRFS FROM HQMC STAFF MEMBERS. HQMC POC IS MR. BILL TUCKER, AV 224-2171/3188.

BT



UNITED STATES MARINE CORPS
Base Maintenance Division
Marine Corps Base
Camp Lejeune, North Carolina 28542

IN REPLY REFER TO
11330
MAIN
27 Dec 84

From: Base Maintenance Officer
To: Public Works Officer

Subj: ESR, CAMP GEIGER/MCAS(H), NEW RIVER WATER DISTRIBUTION SYSTEM

1. Please provide this office with a status on the subject request. The request was forwarded on 18 June 1984.

G. S. JOHNSON, JR.
By direction

CAMLEJ ESR 9E84
PWO
7 Jan 1985

FIRST ENDORSEMENT

From: Public Works Officer, Marine Corps Base, Camp Lejeune
To: Base Maintenance Officer, Marine Corps Base, Camp Lejeune

Subj: ESR, CAMP GEIGER/MCAS(H), NEW RIVER WATER DISTRIBUTION SYSTEM

1. LANTDIV acknowledged receipt of the subject ESR 31 July 1984 and indicated their workload precluded starting in-house study before spring or summer 1985.

E. L. ROUSE
By direction

FILE
→ ESR

ENGINEERING SERVICE REQUEST (ESR)
NAVFAC 11000/7 (4-78)
Supersedes NAVDOCKS 2038
S/N 0105-LF-010-0035 *Instructions on Reverse* Copy No.

SECTION A FOR USE BY REQUESTER

1. FROM (*Activity and location*)
Commanding General, Marine Corps Base, Camp Lejeune, NC 28542-5001

2. TO
Commander, Atlantic Division, Naval Facilities Engineering Command, Norfolk, VA 23511-6287 (Attn: 09A21B3/M. Bryant)

3. REFERENCE(S)

4. ESR IDENTIFICATION NUMBER (*if applicable*)
1E85

5. ENCLOSURE(S) (*check*)
☐ NAVCOMPT 140 ☐ OTHER (*specify*)
☐ NAVCOMPT 2038
☐ NAVCOMPT 372

6. TYPE OF FUNDING (*check*)
☐ O&MN ☐ OTHER (*specify*)
☐ NIF
☐ NAF

7. TYPE OF SERVICES REQUESTED
Slate and select A&E Firm and negotiate A&E contract for work described herein.

8. DESIRED COMPLETION DATE
ASAP

9. DESCRIPTION OF WORK
I. GENERAL: Provide an engineering study to investigate problems associated with waste oil disposal at Camp Lejeune.

II. BACKGROUND: Camp Lejeune has been experiencing numerous problems with disposal of waste oil. The following information is provided:

a. Camp Lejeune collects approximately 200,000 gallons of waste oil annually. This oil is collected from a variety of sources, including waste

10. FOR INFORMATION CONSULT (*Name and phone*)
T. H. HANKINS, JR.
AV: 484-3238

11. OFFICIAL REPRESENTATIVE (*Signature*)
C. A. JOHANNESMEYER
By direction

12. DATE

SECTION B FOR USE BY EFD

1. SCOPE OF SERVICES

2. DATE RECEIVED

3. ESR NUMBER

SECTION C INTERIM ENDORSEMENT

1. REMARKS

2. EST. COMPLETION DATE

3. AUTHORIZED REPRESENTATIVE (*Signature*)

4. DATE

SECTION D FINAL ENDORSEMENT

1. ENCLOSURE(S)
☐ DRAWINGS AND MAPS ☐ SPECIFICATIONS ☐ REPORT
☐ OTHER (*specify*)

2. EST. COST (*if applicable*)
$

3. AUTHORIZED REPRESENTATIVE (*Signature*)

4. DATE OF COMPLETION

COPY TO

oil containers, motor pools, oil-water separators and other pollution abatement facilities. A large amount of water and other substances are found in the waste oil collected.

b. In past years, we have been successful in selling the waste oil for approximately thirty-five cents per gallon. However, recently we have had problems with finding a buyer for the oil due to problems with the high water content. Because of the large amount of waste oil generated and the problems in finding a vendor to remove it, Camp Lejeune is reaching a crisis situation regarding storage capacity. Several large, abandoned tanks have been modified to store the waste oil; however, the available storage will soon reach capacity unless a solution is found.

c. Pollution abatement facilities installed under Project P-996 have greatly increased the amount of waste oil generated and reduced the quality of the oil.

d. Construction Contract N62470-84-C-7804, Disposal of Waste Oil, Building BB-9, has recently been awarded. This contract will provide tanks and pumping stations to store and separate oil so that it can be burned in the boiler plant.

e. Construction Contract N62470-81-B-1464, Replace Boilers and Fuel Storage Tanks, has been under design for approximately three years. Camp Lejeune requested that this contract specify a dual burner boiler for replacement of Boiler #9 at Building BB-9. This would allow burning of waste oil at this plant after completion of Construction Contract #84-C-7804 and #81-B-1464. However, LANTDIV has continued to design the boiler replacement specifying a single burner boiler. It is our understanding that LANTDIV anticiptates mixing waste oil with Number 6 oil during burning.

III. DETAILS OF WORK:

a. The work shall include the following:

(1) Survey existing methods and procedures for collecting and storing waste oil.

(2) Examine waste oil samples and take additional samples as required to determine the quality of waste oil.

(3) Discuss waste oil problems with key Camp Lejeune personnel.

(4) Provide assistance in locating vendors to receive oil from Camp Lejeune as a short time fix.

(5) Review the present marketing procedures used by Defense Property Disposal in selling waste oil.

(6) Review plans and modifications to allow burning of waste oil.

(7) Provide expertise and advice in resolving problems related to waste oil.

b. Deliverables: Provide a study addressing the work outlined in Section III.a. above. Provide recommendations and necessary cost estimates.

c. Special Requirements: 30% and 90% study with cost estimates should be forwarded to this Command (four copies) and to Headquarters Marine Corps (LFF) for review.

d. Time Requirements: Award of the study should be made as soon as possible due to the crisis situation regarding storage capacity.

IV. FUNDS AVAILABLE: FY85 funds have been reserved for the A&E contract and are available upon request.

V. POINT OF CONTACT: Mr. Thomas H. Hankins, Jr., P.E., Manager, Mechanical Section, Design Branch, Public Works Division, AV: 484-3238; FTS: 676-3238.

11330
MAIN
27 Dec 84

From: Base Maintenance Officer
To: Public Works Officer

Subj: P-829, FLY ASH CONTROL SYSTEM BUILDING 1700

1. It is requested that the subject project be resubmitted for FY 86 funding.

2. The project will alleviate the frequent maintenance of controls and equipment and the enviromental conditions associated with the present ash unloading method.

G. S. JOHNSON, JR.
By direction

11330
MAIN
27 Dec 84

From: Base Maintenance Officer
To: Public Works Officer

Subj: ESR, CAMP GEIGER/MCAS(H), NEW RIVER WATER DISTRIBUTION SYSTEM

1. Please provide this office with a status on the subject request. The request was forwarded on 18 June 1984.

G. S. JOHNSON, JR.
By direction

Blind Copy to:
OperBr

ESR

65J
NAB

ENGINEERING SERVICE REQUEST (ESR)
NAVFAC 11000/7 (4-78)
Supersedes NAVDOCKS 2038
S/N 0105-LF-010-0035 *Instructions on Reverse* Copy No.

SECTION A FOR USE BY REQUESTER

1. FROM (Activity and location)
Commanding General, Marine Corps Base Camp Lejeune, NC 28542

2. TO Commander, Atlantic Division, Naval Facilities Engineering Command Norfolk, VA 23511 (Attn: 09A21B3/M. Bryant.)

3. REFERENCE(S)

4. ESR IDENTIFICATION NUMBER (*if applicable*)
9E84

5. ENCLOSURE(S) (*check*)
☐ NAVCOMPT 140 ☐ OTHER (*specify*)
☐ NAVCOMPT 2038
☐ NAVCOMPT 372

6. TYPE OF FUNDING (*check*)
☐ O&MN ☒ OTHER (*specify*) O&MMC
☐ NIF
☐ NAF

7. TYPE OF SERVICES REQUESTED
Engineering Study to investigate Water Distribution System at Marine Corps Air Station (Helicopter)

8. DESIRED COMPLETION DATE
January 1985

9. DESCRIPTION OF WORK

I. GENERAL: Provide an engineering study to investigate the Water Distribution System at Marine Corps Air Station (Helicopter), New River, Jacksonville, NC.

II. BACKGROUND:

a. Presently, the MOQ area is served by an 8-inch dead end distribution line. This creates stagnant water and low water pressure. MOQ 2003 is an

10. FOR INFORMATION CONSULT (*Name and phone*)
G. S. JOHNSON, JR.
AV: 484-5161

11. OFFICIAL REPRESENTATIVE (*Signature*)
C. A. JOHANNESMEYER
By direction

12. DATE
26 JUN 1984

SECTION B FOR USE BY EFD

1. SCOPE OF SERVICES

2. DATE RECEIVED
16 July 84

3. ESR NUMBER
N-4063

SECTION C INTERIM ENDORSEMENT

1. REMARKS Present workload precludes starting in-house study before spring or summer 1985. If earlier date is desired, it should be done by A&E Contract. Cost of study will be between $50K and $100K. Upon receipt of notification of a choice for an A&E Contract and availability of funds, this office will prepare a scope of work and initiate contract proceedings.
PLEASE NOTE NEW EFD.

2. EST. COMPLETION DATE
30 JUN 1985

3. AUTHORIZED REPRESENTATIVE (*Signature*)
J. R. BAILEY
By direction

4. DATE
30 DEC 1984

SECTION D FINAL ENDORSEMENT

1. ENCLOSURE(S)
☐ DRAWINGS AND MAPS ☐ SPECIFICATIONS ☐ REPORT
☐ OTHER (*specify*)

2. EST. COST (*if applicable*)
$

3. AUTHORIZED REPRESENTATIVE (*Signature*)

4. DATE OF COMPLETION

COPY TO
FAC; COMP: MAIN

18101

emergency pumping station with a 300,000 gallon ground storage reservoir for emergency fire protection. This station is considered inadequate for a potable water source. Presently, water is wasted by overflowing the reservoir to maintain the minimum chlorine residual.

b. Presently, the whole Camp Geiger area is served by an 8-inch line. If the demand is not met by Marine Corps Air Station, it is assisted by TC-501 pumping station at Camp Geiger. TC-501 contains a ground water storage tank with a capacity of 872,000 gallons. If too much water is delivered through this line, the nearest elevated tank at Camp Geiger (TC-1070) will overflow while the other elevated tank (TC-606) will decline. The controls for the distribution pumps located in TC-501 are controlled from TC-606 elevated tank.

c. The only method of filling the 872,000 gallon reservoir is through a gate valve located in the distribution line at TC-501. If the valve is opened too much, the water being pumped from TC-501 will recirculate through the distribution line and return to the reservoir. As this occurs, the distribution pressure continues to drop since no water is being delivered except from MCAS. If this continues, the elevated tank (TC-1070) will overflow.

III. DETAILS OF WORK:

a. Investigate water distribution system for Camp Geiger and MCAS(H), New River, including delivered water pumps and water tanks.

b. Determine the size of distribution lines, pumping systems, and storage tank capacities.

c. Provide preliminary drawings and a cost estimate to develop a project to correct deficiencies.

IV. TIME REQUIREMENTS: Completion of study is required by January 1985 to maintain fire protection system.

V. FUNDS AVAILABLE: This Command will furnish O&MMC funds on request.

VI. POINT OF CONTACT: Mr. G. S. Johnson or Mr. David Southerland, Base Maintenance Division, AV: 484-5161; FTS: 676-5161.

11330
MAIN
18 Jun 84

From: Base Maintenance Officer
To: Public Works Officer

Subj: Request for Engineering Services (Should be in caps)

Encl: (1) ESR, Camp Geiger/NCAS(H), New River Water Distribution System

1. The enclosure is forwarded for appropriate action.

G. S. JOHNSON, JR.
By direction

Blind Copy to:
OperBr

Writer: G. S. Johnson, Jr.
Typist: S. H. Kolde, 18 Jun 84

ENGINEERING S[redacted]CE REQUEST - CAMP GEIGER/MCAS[redacted], NEW RIVER
WATER DISTRIBUTION SYSTEM

I. GENERAL. Provide an engineering study to investigate the Distribution System at Marine Corps Air Station.

II. BACKGROUND.

a. Presently the MOQ area is served by an 8 inch dead end distribution line. This creates stagnant water and low water pressure. MOQ 2003 is an emergency pumping station with a 300,000 gallon ground storage reservoir for emergency fire protection. This station is considered inadequate for a potable water source. Presently, water is wasted by overflowing the reservoir to maintain the minimum chlorine residual.

b. Presently, the whole Camp Geiger area is served by an 8 inch line. If the demand is not met by Marine Corps Air Station, it is assisted by TC-501 pumping station at Camp Geiger. TC-501 contains a ground water storage tank with a capacity of 872,000 gallons. If too much water is delivered through this line, the nearest elevated tank at Camp Geiger (TC-1070) will overflow while the other elevated tank (TC-606) will decline. The controls for the distribution pumps located in TC-501 are controlled from TC-606 elevated tank.

c. The only method of filling the 872,000 gallon reservoir is through a gate valve located in the distribution line at TC-501. If the valve is opened too much, the water being pumped from TC-501 will recirculate through the distribution line and return to the reservoir. As this occurs, the distribution pressure continues to drop since no water is being delivered except from MCAS. If this continues, the elevated tank (TC-1070) will overflow.

III. DETAILS OF WORK.

a. Investigate the entire distribution system for the Geiger-Air Station area, including all delivered water pumps and elevated or ground water tanks.

b. Investigate the size of distribution lines, pumping systems and storage tanks for capacities.

c. Provide preliminary drawings and cost estimate sufficient to develop a project to resolve the problems.

IV. POINT OF CONTACT. Mr. G. S. Johnson (Extension 5161) or Mr. David Southerland (Extension 5161).

Encl (1)

T4000

4020
MAIN
16 NOV 1984

From: Base Maintenance Officer, Marine Corps Base, Camp Lejeune
To: Public Works Officer, Marine Corps Base, Camp Lejeune

Subj: ENGINEERING SERVICE REQUEST, WASTE OIL

Encl: (1) Engineering Service Request, Waste Oil

1. It is requested that the request provided as the enclosure be forwarded to LANTDIV for immediate action.

2. Previous conversations with Mr. Dave Goodwin, LANTDIV, indicate that LANTDIV can provide much needed assistance regarding disposal of waste oil.

3. Funding will be provided upon request.

F. E. CONE
By direction

Blind copy to:
AC/S, Fac

Writer: F. E. Cone, X2511
Typist: C. Kowalski, 11/15/84

ENGINEERING SERVICE REQUEST
Waste Oil, Marine Corps Base, Camp Lejeune

I. GENERAL. Provide an engineering study to investigate problems associated with waste oil disposal at Camp Lejeune.

II. BACKGROUND. Camp Lejeune has been experiencing numerous problems with disposal of waste oil. The following information is provided:

a. Camp Lejeune collects approximately 200,000 gallons of waste oil annually. This oil is collected from a variety of sources, including waste oil containers, motor pools, oil-water separators and other pollution abatement facilities. A large amount of water and other substances are found in the waste oil collected.

b. In past years, we have been successful in selling the waste oil for approximately 35¢ per gallon. However, recently we have had problems with finding a buyer for the oil due to problems with the high water content. Because of the large amount of waste oil generated and the problems in finding a vendor to remove it, Camp Lejeune is reaching a crisis situation regarding storage capacity. Several large abandoned tanks have been modified to store the waste oil. However, the available storage will soon reach capacity unless a solution is found.

c. Pollution abatement facilities installed under Project P-996 have greatly increased the amount of waste oil generated and reduced the quality of the oil.

d. Contract #84-7804, Disposal of Waste Oil, Building BB-9 has recently been awarded. This contract will provide tanks and pumping stations to store and separate oil so that it can be burned in the boiler plant.

e. Contract #81-1464, Replace Boilers and Fuel Storage Tanks, has been under design for approximately three years. Camp Lejeune requested that this contract specify a dual burner boiler for replacement of Boiler #9 at Building BB-9. This would allow burning of waste oil at this plant after completion of contracts #84-7804 and #81-1464. However, LANTDIV has continued to design the boiler replacement specifying a single burner boiler. It is our understanding that LANTDIV anticipates mixing waste oil with Number 6 oil during burning. Camp Lejeune personnel have several concerns regarding this approach that require discussion with LANTDIV personnel.

III. DETAILS OF WORK.

a. Survey existing methods and procedures for collecting and storing waste oil.

b. Examine waste oil samples and take additional samples as required to determine the quality of waste oil.

c. Discuss waste oil problems with key Camp Lejeune personnel.

d. Provide assistance in locating vendors to receive oil from Camp Lejeune as a short time fix.

e. Review the present marketing procedures used by Defense Property Disposal in selling waste oil.

f. Review plans and modifications to allow burning of waste oil.

g. Provide expertise and advice in resolving problems related to waste oil.

IV. POINT OF CONTACT. Mr. F. E. Cone, AV 484-2511.

→ Copy to 81 Done Utilities
→ File 11/22/82

ENGINEERING SERVICE REQUEST (ESR)
NAVFAC 11000/7 (4-78)
Supersedes NAVDOCKS 2038
S/N 0105-LF-010-0035 *Instructions on Reverse* Copy No.

SECTION A FOR USE BY REQUESTER

1. FROM (*Activity and location*)
Commanding General, Marine Corps Base, Camp Lejeune, NC 28542

2. TO
Commander, Atlantic Division, Naval Facilities Engineering Command, Norfolk, V 235

3. REFERENCE(S)

4. ESR IDENTIFICATION NUMBER (*if applicable*)
3E83

5. ENCLOSURE(S) (*check*)
☐ NAVCOMPT 140 ☐ OTHER (*specify*)
☐ NAVCOMPT 2038
☐ NAVCOMPT 372

6. TYPE OF FUNDING (*check*)
☐ O&MN XX OTHER (*specify*) O&MMC
☐ NIF
☐ NAF

7. TYPE OF SERVICES REQUESTED
Engineering Study for Updating of Navy Air Pollution Source Information System (NAPSIS) Masterfile.

8. DESIRED COMPLETION DATE
July 1983

9. DESCRIPTION OF WORK
I. GENERAL: Engineering services are required for the following:

a. Revise the NAPSIS Masterfile so as to show a separate listing for all sources (as of 31 December 1982) on Marine Corps Base, Camp Lejeune; Marine Corps Air Station (H), New River; and Naval Regional Medical Center, Camp Lejeune.

10. FOR INFORMATION CONSULT (*Name and phone*)
Vann Marshburn
AV: 484-1833

11. OFFICIAL REPRESENTATIVE (*Signature*)
R. E. CARLSON
By direction

12. DATE
16 NOV 1982

SECTION B FOR USE BY EFD

1. SCOPE OF SERVICES

2. DATE RECEIVED

3. ESR NUMBER

SECTION C INTERIM ENDORSEMENT

1. REMARKS

2. EST. COMPLETION DATE

3. AUTHORIZED REPRESENTATIVE (*Signature*)

4. DATE

SECTION D FINAL ENDORSEMENT

1. ENCLOSURE(S)
☐ DRAWINGS AND MAPS ☐ SPECIFICATIONS ☐ REPORT
☐ OTHER (*specify*)

2. EST. COST (*if applicable*)
$

3. AUTHORIZED REPRESENTATIVE (*Signature*)

4. DATE OF COMPLETION

COPY TO (w/o encl) AC/S, Fac; AC/S, Comp
Blind copy to: MAIN

b. Identify sources requiring permits from the State of North Carolina in accordance with the Clean Air Act.

c. Provide technical data needs to prepare required permit applications for existing sources (as of 31 December 1982).

II. BACKGROUND: Scope of work identified herein was discussed with Mr. M. Davenport (LANTDIV CODE 11).

III. DETAILS OF WORK: Perform engineering services providing updated NAPSIS Masterfile and required permits with supporting technical data.

IV. FUNDS AVAILABLE: Funds for these services will be provided upon request.

V. POINT OF CONTACT: Mr. Vann MARSHBURN, Planning Section, Design Branch, Public Works Division, AUTOVON: 484-1833

RG

for CW.
File - ESR file

DEPARTMENT OF THE NAVY
ATLANTIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
NORFOLK, VIRGINIA 23511

TELEPHONE NO.
444-9561
AUTOVON 690-9561

IN REPLY REFER TO:
114:DPG:ejc
6280

1 5 MAR 1982

From: Commander, Atlantic Division, Naval Facilities Engineering Command
To: Commanding General, Marine Corps Base, Camp Lejeune

Subj: Engineering Service Request (ESR) U-2017, Handling Wastewater from Electrostatic precipitators (ESPs) and Ash System, Building 1700; completion of

Ref: (a) FONECON MCB CAMP LEJEUNE (Mr. T. Hankins)/LANTNAVFACENGCOM (Mr. D. Goodwin) of 16 Feb 1982
(b) ESR 6-E80: Evaluate Stacks
(c) ESR 23-E80: Evaluate ESP
(d) ESR 22-E80: Evaluate Ash Silo
(e) ESP Evaluation by NAVENENVSA (dated Feb 1982; received 5 Mar 1982)
(f) FY-84 Pollution Abatement MCON Project P-780 ($200K)
(g) FONECON COMNAVFACENGCOM (Mr. D. Olson)/LANTNAVFACENGCOM (Mr. D. Goodwin) of 9 Mar 1982
(h) FONECON LANTNAVFACENGCOM Code 403 (Mr. R. Tisdale)/ LANTNAVFACENGCOM Code 1142 (Mr. D. Goodwin) of 9 Mar 1982
(i) FONECON MCB CAMP LEJEUNE (Mr. D. Southerland)/LANTNAVFACENGCOM (Mr. D. Goodwin) of 9 Mar 1982

Encl: (1) Engineering Service Request U-2017

1. Discussion of the enclosure (1) ESR, via reference (a), indicated a related ESR (reference (b)). Further discussions indicated two more related ESRs (references (c) and (d)) and a related study (reference (e)).

2. The subject wastewaters consist of:

a. ESP washdwon (presently once per year, but implementation of references (b), (c) and (e) anticipated recommendations should reduce this washdown frequency to once per five to ten years or preferably eliminate this wastewater entirely) and;

b. Ash silo wastewater (reference (d) is anticipated to recommended improvements which should reduce this discharge also).

3. The best method for collecting and disposing of these wastewaters is to use a hose to convey the infrequent ESP washdown and a hardpipe to convey the more frequent ash silo wastewater to the treatment system to be provided by reference (f) for coalpile stormwater run-off (i.e., a surge/settling basin and a sanitary sewer connection). Additionally, the ash silo wastewater could be minimized by curbing or enclosing the ash hopper area.

114:DPG:ejc
6280

4. Reference (g) confirmed that reference (f) could be modified to accomplish the limited work stated above. Reference (h) indicated the field work for references (b) through (d) will be performed during early April 1982. Completion of this ESR was discussed via reference (i).

5. In summary, after design authorization is obtained, LANTNAVFACENGCOM will modify reference (f) in accordance with the above.

J. R. Bailey
J. R. BAILEY, P.E.
By direction

Copy to:
NAVFACENGCOM (Code 112)
CMC

MAIN/FEC/rn
11370
13 Jan 1982

From: Base Maintenance Officer
To: Public Works Officer

Subj: Repairs to exterior walls, Building 1700

Ref: (a) Site Investigation of Structural Damage at Building 1700 on 5 Jan 1981

1. As discussed during reference (a), it is requested that a study of exterior cracks and other structural problems be performed at Building 1700. It is further requested that plans and specifications be prepared to accomplish repairs determined to be necessary.

2. Funding will be provided upon notification.

F. E. CONE

Copy to:
OperBr

T-11300/5

MAIN/FEC/rn
11370
4 Jan 1981

From: Base Maintenance Officer
To: Public Works Officer

Subj: Request for Engineering Services

Encl: (1) ESR, Stack Caps, Building 1700
(2) ESR, Handling Wastewater, Building 1700

1. Enclosures (1) and (2) are forwarded for appropriate action.

F. E. CONE
By direction

Copy to:
OperBr

ENGINEERING SERVICE REQUEST - STACK CAPS, BLDG 1700

I. General. Provide an engineering study to investigate the installation of rain caps on the original stub stacks on Boilers 1, 2, 3, and 4, at the Central Heating Plant, Building 1700.

II. Background. Boilers 1, 2, 3, and 4, at Building 1700 are 100,000 lbs/hr capacity boilers with a capability of firing with coal or No. 6 fuel oil. When firing with coal, the precipitator stacks are utilized. Stub stacks are normally used when firing with No. 6 fuel. When the stub stacks are being used, the temperature maintained by the boiler gases evaporate moisture from rainfall. However, because the stub stacks are infrequently used (present firing plan calls for 90% coal/10% oil), the moisutre collects in the stacks, mixes with ash, and hardens; thereby blocking the ash conveying system for the stacks. Each time it rains, approximately 16 manhours are required to clean out the system.

III. Details of Work.

a. Investigate installation of caps on the stacks to limit moisture in the stacks. Effect on boiler operation should be carefully studied.

b. Investigate alternatives such as an improved drainage system for the stacks.

c. Provide preliminary drawings and cost estimate to resolve the problem (sufficient to develop project).

IV. Point of Contact. Mr. F. E. Cone (ext. 5161) or Mr. David Southerland (ext. 3627).

Enclosure (1)

ENGINEERING SERVICE REQUEST - STACK CAPS, BLDG 1700

I. General. Provide an engineering study to investigate the installation of rain caps on the original stub stacks on Boilers 1, 2, 3, and 4, at the Central Heating Plant, Building 1700.

II. Background. Boilers 1, 2, 3, and 4, at Building 1700 are 100,000 lbs/hr capacity boilers with a capability of firing with coal or No. 6 fuel oil. When firing with coal, the precipitator stacks are utilized. Stub stacks are normally used when firing with No. 6 fuel. When the stub stacks are being used, the temperature maintained by the boiler gases evaporate moisture from rainfall. However, because the stub stacks are infrequently used (present firing plan calls for 90% coal/10% oil), the moisutre collects in the stacks, mixes with ash, and hardens; thereby blocking the ash conveying system for the stacks. Each time it rains, approximately 16 manhours are required to clean out the system.

III. Details of Work.

a. Investigate installation of caps on the stacks to limit moisture in the stacks. Effect on boiler operation should be carefully studied.

b. Investigate alternatives such as an improved drainage system for the stacks.

c. Provide preliminary drawings and cost estimate to resolve the problem (sufficient to develop project).

IV. Point of Contact. Mr. F. E. Cone (ext. 5161) or Mr. David Southerland (ext. 3627).

Enclosure (1)

T-11300 J
E-W
Environ.

BASE MAINTENANCE DEPARTMENT
Marine Corps Base
Camp Lejeune, North Carolina 28542

MAIN/FEC/kmd
4330
26 May 1981

From: Base Maintenance Officer
To: Public Works Officer

Subj: Request for Engineering Services

Encl: (1) ESR for Grease Disposal Problem

1. Enclosure (1) is forwarded for action.

2. Point of contact is Mr. Fred Cone, 451-5855.

F. E. Cone

F. E. CONE
By direction

Copy to:
OpnsDiv
UtilDiv
NREADiv

ENGINEERING SERVICE REQUEST FOR GREASE DISPOSAL

I. General. Engineering services are required to determine proper disposal of grease and liquid pumped out of grease traps at Marine Corps Base, Camp Lejeune.

II. Background. Camp Lejeune presently pumps approximately 25,000 gallons of grease and water weekly from 57 grease traps around the base. The grease traps are located primarily at dining facilities, schools, clubs and other eating establishments. In the past, the liquid/grease has been deposited in the sanitary landfill. However, during a recent inspection of the landfill by a state inspector, we were directed to stop putting any liquid into the landfill. We have investigated several alternatives regarding possible disposal of the grease:

a. Selling to commercial source - a sample has been taken and sent to a private lab for analysis to determine the value (if any) of the grease. It is likely that the grease will require separation to get it into a form to sell.

b. Land Application - direct application to land (must prevent surface runoff).

c. Pit Disposal - disposal in a pit (periodically fill pit and relocate).

d. Disposal in Sewage Plant - Utilities personnel presently do not recommend disposal in the Sewage Plant. An attempt is being made to include installation of an automatic oil separator in the main Sewage Plant under Project P-789. This would allow disposal in the plant, however, completion would not be expected prior to FY83 (at the earliest).

We are presently considering alternatives (b) and (c) above as short-term solutions. However, environmental and maintenance requirements may make these uneconomical.

III. Scope of Work.

a. Review possible alternatives to the problem.

b. Determine best solution, short-term and long-term.

c. Provide project data for any future construction recommended.

IV. Funding. Will be provided upon request.

Mr. Jerry Hatcher
Utilities, MCB, CLNC
T-11300

UNITED STATES MARINE CORPS
Marine Corps Air Station
(Helicopter)
New River, Jacksonville
North Carolina 28545

204:MMMS:cbm
11000/P-439
19 May 1981

From: Commanding Officer
To: Commanding General (Public Works Officer), Marine Corps Base, Camp Lejeune, North Carolina 28542

Subj: Engineering Service Request

Ref: (a) BO 11000.2

1. In accordance with the reference, a study to determine the feasibility of installing central air-conditioning in the office and maintenance spaces in AS-504 is requested. This study should be based on the most energy efficient, cost effective chiller systems available. The purpose of this request is to determine the amount of power that can be saved by converting to a central system.

2. Currently, this hangar has 14 220V and 35 110V window-type air-conditioning units. If you require further information, please contact Mr. F. E. Acosta or Mrs. M. M. M. Smith on 455-6506/6518.

CARL H. YUNG
By direction

T-11300/S
7A Gen

ENGINEERING SERVICE REQUEST (ESR)
NAVFAC 11000/7 (4-78)
Supersedes NAVDOCKS 2038
S/N 0105-LF-010-0035

Instructions on Reverse

Copy No.

SECTION A FOR USE BY REQUESTER

1. FROM (*Activity and location*)
Commanding General, Marine Corps Base, Camp Lejeune, NC 28542

2. TO
Commander, Atlantic Division, Naval Facilities Engineering Command, Norfolk, VA 23511

3. REFERENCE(S)
(a) LANTDIV ltr 114:JJH ESR U-8006 of 8 Jan 80

4. ESR IDENTIFICATION NUMBER (*if applicable*)
13E81

5. ENCLOSURE(S) (*check*)
☐ NAVCOMPT 140
☐ NAVCOMPT 2038
☐ NAVCOMPT 372
☐ OTHER (*specify*)

6. TYPE OF FUNDING (*check*)
☐ O&MN
☐ NIF
☐ NAF
☒ OTHER (*specify*) OMMC

7. TYPE OF SERVICES REQUESTED
Engineering Study, Camp Geiger and MCAS(H), New River Sewage Collection System Infiltration

8. DESIRED COMPLETION DATE
31 Dec 1981

9. DESCRIPTION OF WORK
I. GENERAL. Engineering services are required to locate the sources of storm water infiltration into the Camp Geiger and MCAS(H), New River, Sewage Collection System.

II. BACKGROUND. Reference (a) provided the results of a previous ESR which confirmed that storm water is entering the system, thereby overloading the treatment plant during storms.

10. FOR INFORMATION CONSULT (*Name and phone*)
E. ROUSE, AV:484-3238

11. OFFICIAL REPRESENTATIVE (*Signature*)
R. E. CARLSON
By direction

12. DATE
14 MAY 1981

SECTION B FOR USE BY EFD

1. SCOPE OF SERVICES

2. DATE RECEIVED

3. ESR NUMBER

SECTION C INTERIM ENDORSEMENT

1. REMARKS

2. EST. COMPLETION DATE

3. AUTHORIZED REPRESENTATIVE (*Signature*)

4. DATE

SECTION D FINAL ENDORSEMENT

1. ENCLOSURE(S)
☐ DRAWINGS AND MAPS
☐ SPECIFICATIONS
☐ REPORT
☐ OTHER (*specify*)

2. EST. COST (*if applicable*)
$

3. AUTHORIZED REPRESENTATIVE (*Signature*)

4. DATE OF COMPLETION

COPY TO AC/S, Fac; BMaintO; OICC (02)

III. DETAIL OF WORK.

A. Perform a detailed infiltration study of the system as described in enclosure (8) to reference (a), locating all sources of storm water infiltration.

B. Provide recommended corrective measures and a cost estimate for correction.

C. Time Requirements: Completion of the study is desired by 31 December 1981 so a repair project can be developed for the FY83 Major Repair Program.

IV. FUNDS AVAILABLE. Local OMMC funds in the amount of $20,000 have been reserved for the study.

V. POINT OF CONTACT: Eris L. ROUSE, AV: 484-3238.

DEPARTMENT OF THE NAVY
ATLANTIC DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
NORFOLK, VIRGINIA 23511

TELEPHONE NO.
444-7313
AUTOVON 690-7313

IN REPLY REFER TO:
114:JJH
ESR U-8006
8 JAN 1980

From: Commander, Atlantic Division, Naval Facilities Engineering Command
To: Commanding General, Marine Corps Base, Camp Lejeune

Subj: Engineering Service Request (ESR) U-8006, Engineering Study (Camp Geiger and Marine Corps Air Station (Helicopter) New River) Sewage Collection System

Ref: (a) LANTNAVFACENGCOM ltr 114:JJH 6280 of 4 Jan 1979

Encl: (1) Pump curve and system curve data
(2) Pump system curves
(3) Sewage pumped from MCAS New River to Camp Geiger Sewage Treatment Plant, 2-6 Oct 1979
(4) Sewage flow graph, 2-6 Oct 1979
(5) Calculations of peak flows
(6) Hydrograph for storm, 3 Oct 1979
(7) Camp Geiger Sewage Treatment Plant Surge Basin Evaluation
(8) Scope of Work for Inflow Contract

1. A preliminary report of ESR U-8006 was returned with reference (a) indicating that infiltration studies requested by the subject ESR would be completed during an Environmental Engineering Survey. This letter comprises a report of the completed study.

2. The Camp Geiger plant treats sewage collected from Camp Geiger and the Marine Corps Air Station (MCAS), New River. Sewage flows to the plant from Camp Geiger by gravity, and from the MCAS by pumping. Modifications that were made to the Camp Geiger plant included the construction of a sewage surge basin. The basin capacity is insufficient to handle large storm flows. The dry and storm weather flows to the plant and the operation of the surge basin were evaluated and reported in LANTNAVFACENGCOM memoranda to Code 09A2E of 28 February 1978 and 21 March 1978. They were forwarded as a preliminary report of the ESR to Camp Lejeune under cover letters 09A21E:MLB 11010/MARCORB CAMP LEJEUNE of 14 April 1978 and 114:JJH 6280 of 4 January 1979.

3. To determine the extent of the excessive storm water collected and pumped to Camp Geiger by the MCAS, pump recording instruments were delivered to base personnel to operate through dry and storm days. The results of the recordings for October 2-6, 1979, which included a storm, were analyzed (enclosures (1), (2) and (3)), and graphed (enclosure (4)). The normal dry

day morning peaks were calculated (enclosure (5)), and a hydrograph of the storm flow was made (enclosure (6)). A design two-hour/five-year storm was imposed on the hydrograph, and compared with a normal morning dry day peak (enclosure 6)). The surge basin capacity at the Camp Geiger sewage treatment plant was evaluated and the percentage of MCAS water for storm water for the design flow calculated (enclosure (7)). MCAS contributes about 60 percent of the normal treatment plant flows, and it is calculated that the percent of surge basin capacity required by flows from MCAS during the design storm range from 29 percent for an empty basin at the start of the storm to 60 percent for the basin three quarters filled at the start of the storm. This indicates that while most of the excess water delivered to the treatment plant during heavy rainstorms is from Camp Geiger; a significant quantity comes from the MCAS.

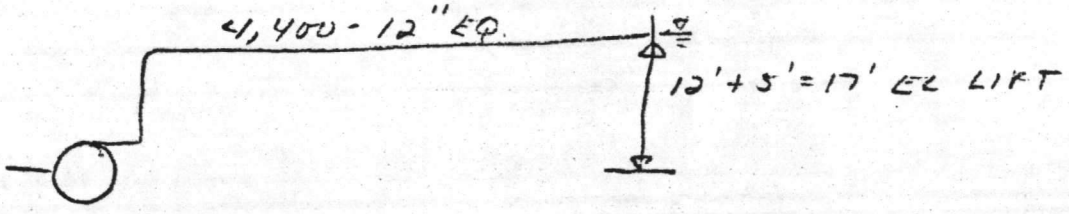
4. It is recommended that an A&E contract be let for a detailed storm water inflow examination of the Camp Geiger and MCAS sewage collection system. Experience with normal infiltration/inflow (I/I) studies by TV camera inspection for locating stormwater inflow points has been disappointing, and it is recommended that I/I studies be performed as outlined in enclosure (8). While this method is rain dependent and time consuming, it promises to produce better results than the normal smoke, dye, rain simulation, TV inspection I/I study.

ANDRES TALTS, P.E.
By direction

DATE ..... SUBJECT PUMP CURVE + SYSTEM CURVE DATA ..... SHEET NO. ..... OF .....

BY ..... DATE ..... JOB NO. .....

AURORA 4X5X12" PUMPS RATED 700 GPM @ 40'
10¼" IMP MEASURED 883 GPM, 42.6" FROM CURVE

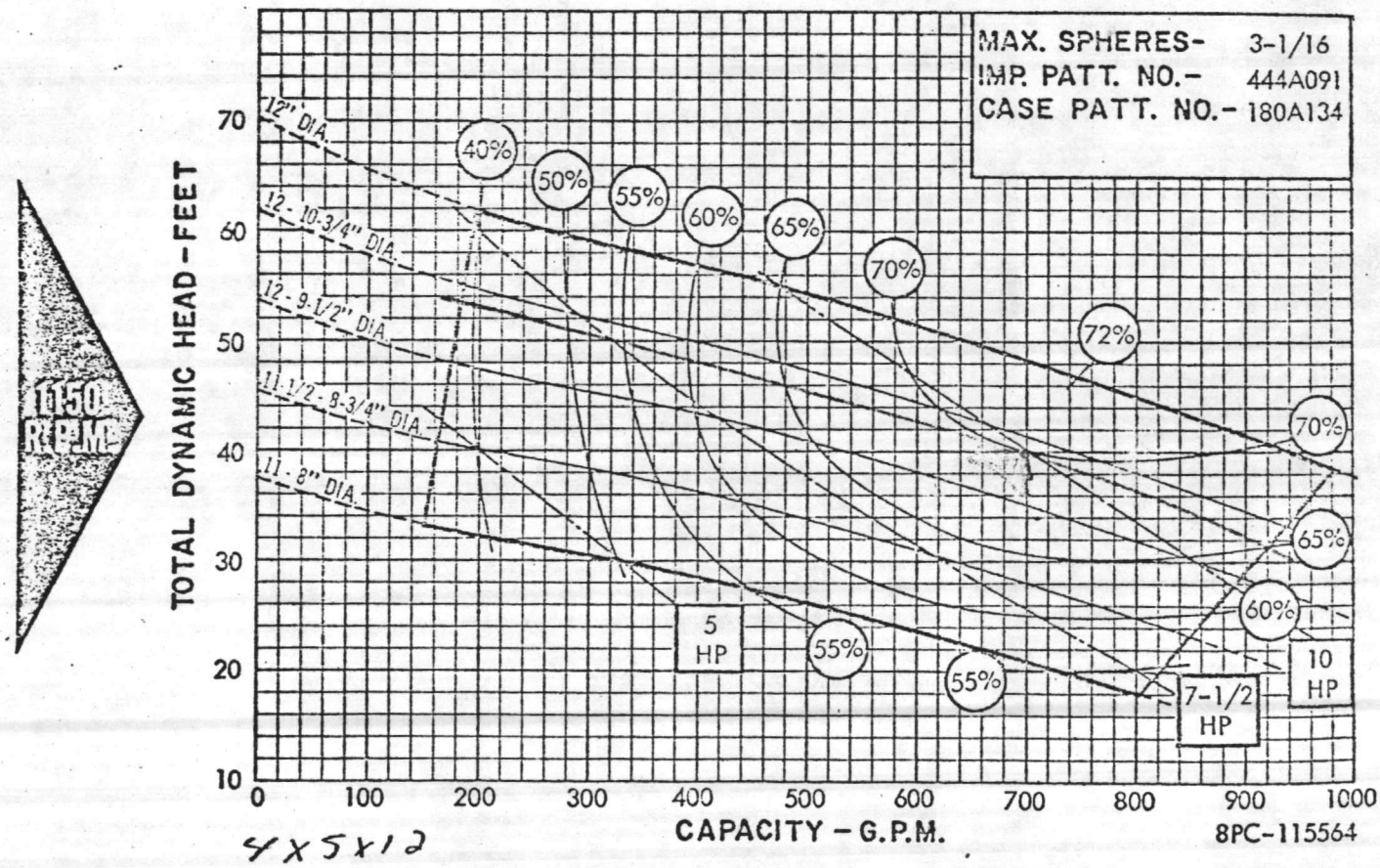


FRICTION HD = 42.6' - 17' = 25.6'

$$K = \frac{25.6'}{(883)^{1.852}} = 8.923 \times 10^{-5}\ ;\ HD = 17 + 8.923 \times 10^{-6} Q^{1.852}$$

SYSTEM CURVE

GPM	200	400	600	800	1000	1200
HD	18.6'	23'	29.5'	38'	49'	62'

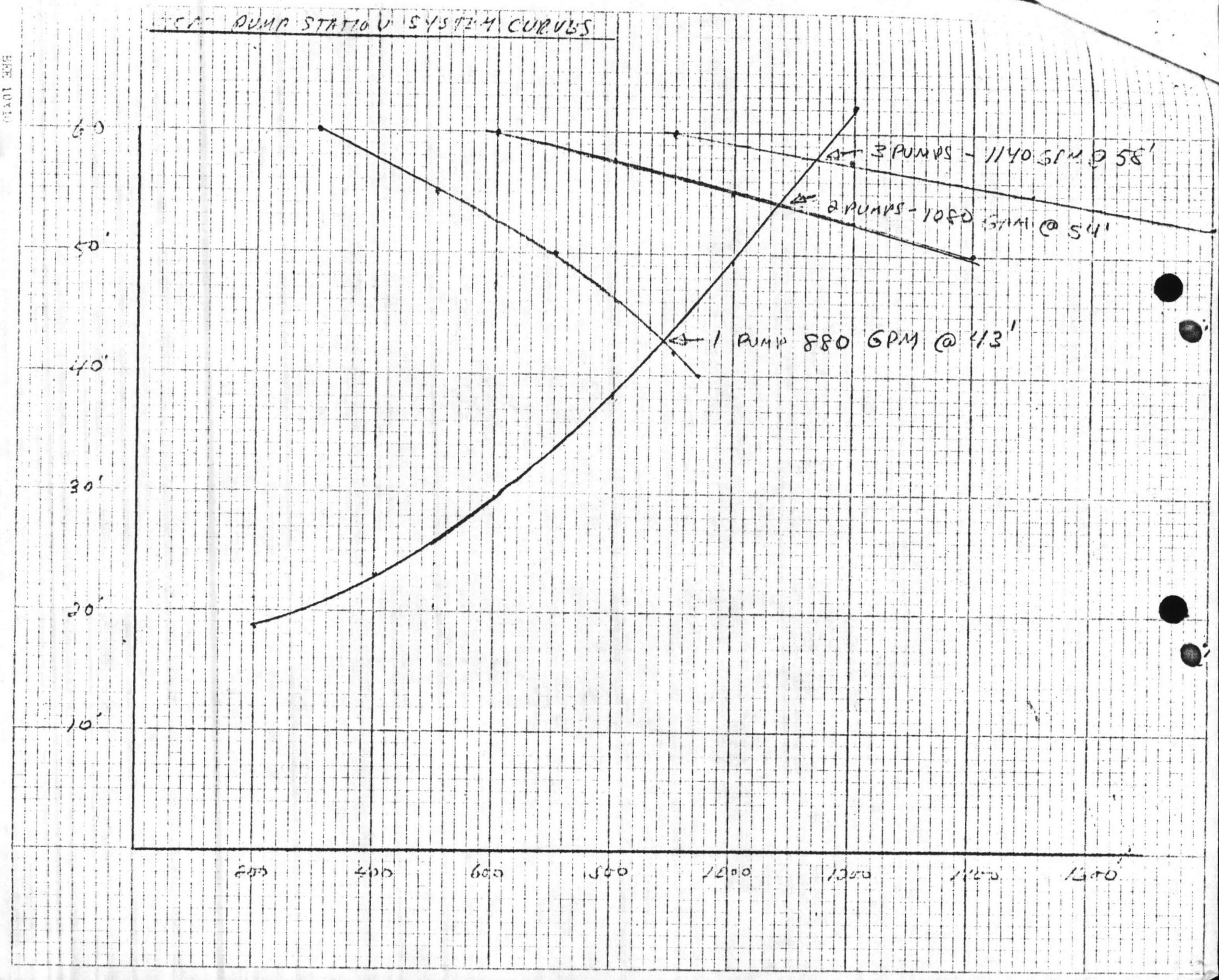


4X5X12

610 SERIES
10¼" IMP

AURORA PUMP
A UNIT OF GENERAL SIGNAL CORPORATION
800 AIRPORT ROAD · NORTH AURORA, ILLINOIS · 60542

ENCL (1)


USA PUMP STATION SYSTEM CURVES
60'
50'
40'
30'
20'
10'
3 PUMPS - 1140 GPM @ 58'
2 PUMPS - 1060 GPM @ 54'
1 PUMP 880 GPM @ 43'

MCAS NEW RIVER SWG PUMP STATION TO CAMP GEIGER 10/4/79 - 10/6/79. (RAIN 10/5/79)

ENCL (3)

				1	2		3
					FLOW		
HOUR	FROM	TO	CYCLES	MIN PUMP ON	GPM HR	KGAL HR	RAIN IN/HR
57	1800	1900	5	28.2	445	26.8	
58		2000	6	33.6	530	31.9	
59		2100	5	27.5	435	26.1	
60		2200	6	25.3	400	24.0	
61		2300	5	21.9	345	20.8	
62		MID	5	21.1	335	20.0	→ .57 MGD
63	MID	0100	5	17.1	270	16.2	
64	10/5/79	0200	4	16.0	255	15.2	
65		0300	3	11.2	175	10.6	
66		0400	4	12.0	190	11.4	
67		0500	4	12.8	200	12.2	
68		0600	4	13.8	220	13.1	
69		0700	5	21.1	335	20.0	
70		0800	4	24.0 - 1P 7.5 - 3P	590 PK - 1300	35.2	
71		0900	5	31.1	500	29.8	
72		1000	6	24.0	380	22.8	
73		1100	5	26.2	415	24.9	
74		NOON	5	24.0	380	22.8	
75	NOON	1300	6	34.7	550	33.0	
76		1400	5	33.6	530	31.9	
77		1500	5	30.8	500	31.1	
78		1600	6	35.8	565	34.6	
79		1700	5	33.6	530	31.9	
80		1800	6	36.3	575	34.5	
81		1900	5	34.7	550	33.0	
82		2000	6	33.6	530	31.9	
83		2100	5	29.5	470	28.1	
84		2200	6	30.56	480	28.7	
85		2300	6	30.3	480	28.8	

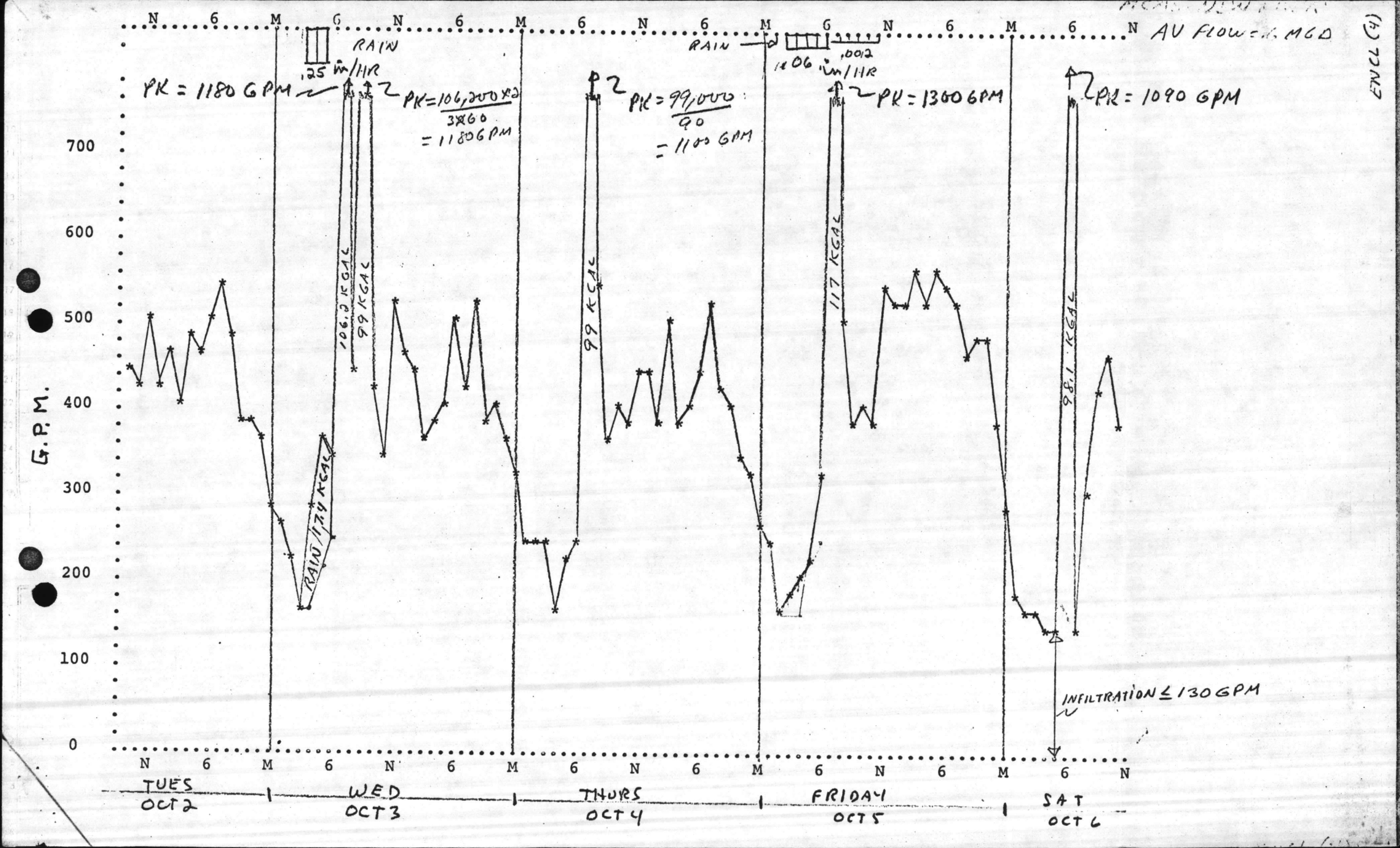
				4	5	6	7	8	9		10
									FLOW		
HOUR	FROM	TO	CYCLES	MIN PUMP ON	GPM HR	KGAL HR	RAIN IN/HR				
86		MID	5	24.3	385	23.1		1			
87	MID	0100	5	18.2	295	17.7	.605 MGD	2			
88	10/6/79	0200	4	11.5	180	10.9		3			
89		0300	3	10.6	170	10.1		4			
90		0400	3	10.4	165	9.9		5			
91		0500	3	9.9	155	9.4		6			
92		0600	3	9.6	152	9.1		7			
93		0700	4	10.4 - 1P 4.8 - 3P	300 PK - 1090	17.9		8			
94		0800	3	9.6	150	9.1		9			
95		0900	5	19.5	310	18.5		10			
96		1000	5	26.4	420	25.1		11			
97		11	6	29.8	470	28.3		12			
98		NOON	5	24.3	385	23.1		13			
99								14			
100								15			
101								16			
102								17			
103								18			
104								19			
105								20			
								21			
								22			
								23			
								24			
								25			
								26			
								27			
								28			
								29			

MCAS NEW RIVER PUMP STATION TO CAMP GEIGER - 10/2/79 TO 10/4/79 (RAIN 10/3/79)

TAPE 178 in/47.5 HRS = 3.75 in/HR = 16.01 min/inch

HOUR	OCT 2, 1979 FROM	TO	CYCLES	MIN. PUMP ON	FLOW GPM HR	FLOW K.GAL HR	RAIN in/HR	OCT 3-79 HOUR	FROM	TO	CYCLES	MIN PUMP ON	FLOW GPM HR	FLOW KGAL HR	RAIN IN/HR
1	10	11	5	28.09	450	24.7		28	1300	1400	6	29.6	410	26.1	
2	10/2/79	NOON	5	26.3	416	25		29		1500	5	27.6	437	26.2	
3	NOON	1300	5	32.4	513	30.8		30		16	5	23.5	372	22.3	
4		1400	5	26.5	420	25.2		31		17	5	24.1	385	23.2	
5		1500	5	27.0	460	27.7		32		18	5	26.3	415	25.0	
6		1600	5	25.2	480	23.9		33		19	6	31.0	500	30.1	
7		1700	6	31.2	495	29.6		34		20	5	26.8	425	25.5	
8		1800	5	30.0	475	28.5		35		21	6	33.1	525	31.4	
9		1900	5	32.1	508	30.5		36		22	5	24.7	390	23.5	
10		2000	6	34.4	545	32.7		37		23	5	25.2	405	24.3	
11		2100	5	30.5	480	29.0		38		1113	5	22.7	360	21.6	
12		2200	5	29.7	470	28.5		39	1412	0100	5	21.1	335	20.2	
13		2300	5	29.2	465	28.0		40	10/4/79	0200	4	16.2	255	15.4	
14		MID	5	22.7	360	21.6		41		0300	4	15.4	245	14.6	
15	MID	0100	6	17.9	285	17.0		42		0400	4	13.3	210	14.5	
16	10/3/79	0200	4	16.9	265	16.0		43		0500	3	11.0	174	10.5	
17		0300	4	14.6	230	13.9		44		0600	3	14.9	230	13.9	
18		0400	3	10.4	165	9.9		45		0700	3	16.1	255	15.3	
19		0500	5	18.2	290	17.3		46		0800	4	30.5 - 1P	620	37.1	
20		0600	5	23.9	360	21.7						14.9 - 2P	PK=1100		
21		0700	5	21.6	340	20.5		47		0900	6	34.0	550	33.2	
22		0800	5	21.4 - 1P	580	34.2	.25	48		1000	5	22.7	360	21.6	.56 MAX
23				5.7 - 3P	PK=1180			49		1100	5	25.6	405	24.32	
24	0800	0900	5	27.9	440	26.5	.05	50		NOON	5	24.3	385	23.1	
25		1000	5	5.1 - 1P			.2	51		1300	5	28.5	450	27.0	
				11.4 - 2P	530	31.8		52		1400	5	28.0	445	26.6	
				4.9 - 3P	PK=1100		.58 MAX	53		1500	5	24.0	380	22.8	
25	1000	1100	6	27.4	435	26.0		54		1600	6	31.7	500	30.1	
		NOON	5	21.4	340	20.3		55		1700	5	24.8	390	23.6	
	NOON	1300	5	23.9	435	23.2		56		1800	6	26.0	415	24.1	

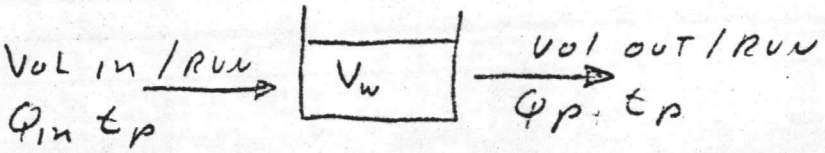
RAIN (.)


AV FLOW = .6 MGD
ENCL (4)
RAIN
.25 in/HR
PK = 1180 GPM
PK = 106,200 x 2 / 3 x 60 = 1180 GPM
106.2 KGAL
99 KGAL
RAIN 129 KGAL
PK = 99,000 / 90 = 1100 GPM
99 KGAL
RAIN
.006 in/HR
.002
PK = 1300 GPM
117 KGAL
PK = 1090 GPM
98.1 KGAL
INFILTRATION ≤ 130 GPM
G.P.M.
700
600
500
400
300
200
100
0
N 6 M 6 N 6 M 6 N 6 M 6 N 6 M 6 N 6 M 6 N
TUES OCT 2
WED OCT 3
THURS OCT 4
FRIDAY OCT 5
SAT OCT 6

DATE ..... SUBJECT CAMP GEIGER ST.
CKD. BY ..... DATE ..... MCAS PUMP STA. EVALUATION
CALCULATION OF PEAK FLOWS
SHEET NO. ..... OF .....
JOB NO. .....

CAPACITY OF MCAS PUMP STATION WETWELL

FOR A PUMP RUN t_p (MIN); t_f = TIME TO FILL



FOR 3 PUMPS OPERATING, Q_p = 1660 GPM
" 1 " " Q_p = 950 GPM

$$Q_{in} t_p + V_w = Q_p t_p \; ; \; Q_{in} t_f = V_w$$

$$\frac{V_w}{t_f} t_p + V_w = Q_p t_p \; ; \; V_w \left(\frac{t_p}{t_f} + 1\right) = Q_p t_p$$

$$V_w = \frac{Q_p t_p}{\left(\frac{t_p}{t_f} + 1\right)}$$

EARLY HOURS FLOW 3-4 AM - 10/3/79 (3 CYCLES / HR)
TOTAL PUMP ON TIME = 10.4 MIN, $t_p = \frac{10.4}{3} = 3.47$ MIN
TOTAL PUMP OFF TIME = 60 - 10.4 = 49.6 MIN
$t_f = \frac{49.6}{3} = 16.5$ MIN

$$V_w = \frac{950 \times 3.47}{\left(\frac{3.47}{16.5} + 1\right)} = 2725 \text{ gal}$$

FOR 3 PUMP OPP. - $Q_{in} \times t_p + 2725 = 1660\, t_p$

$$Q_{in} = \frac{1660\, t_p - 2725}{t_p} = 1660 - \frac{2725}{t_p}$$

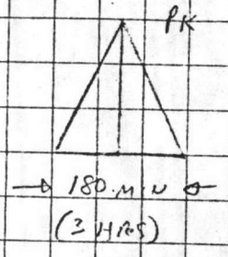
PK	t_p	Q_{in}
10/3/79 - 7-8 AM	4.9 MIN	1100 GPM
10/3/79 - 9-10 AM	5.7 MIN	1180 GPM
10/4/79	9.9 MIN	1100 GPM
10/5/79	7.5 MIN	1300 GPM
10/6/79	4.6 MIN	1100 GPM

ENCL (5)

ENCL (5)

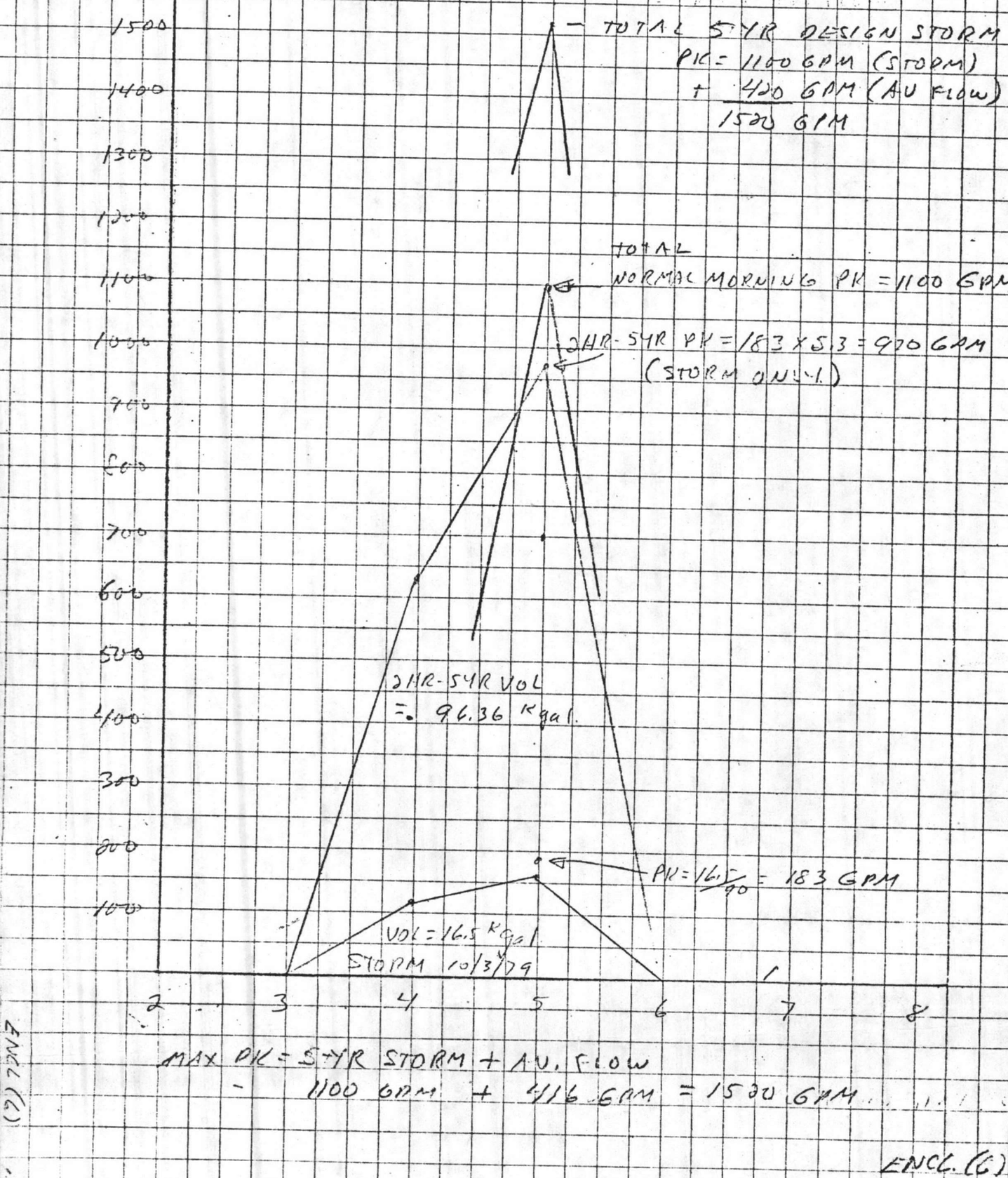
STORM HYDROGRAPH

2HR-5YR STORM = 1.3 in/HR, MULTIPLIER = 1.3/0.25 = 5.3



$$Vol = \frac{PK(GPM) \times MIN}{2} = 90 \cdot PK$$

$$PK = Vol(GAL) / 90\ MIN$$



MAX PK = 5YR STORM + AU. FLOW
= 1100 GPM + 416 GPM = 1520 GPM

ENCL. (6)

(2) ENCL

DATE ..... SUBJECT CAMP GEIGER SEWAGE TRT PLT SURGE BASIN EVALUATION ..... SHEET NO. ..... OF .....

CHKD. BY ..... DATE ..... JOB NO. .....

SEWAGE FLOWS FROM 9/76 TO 5/77 BEFORE CAMP GEIGER AND MCAS WERE COMBINED

	9/76	10/76	11/76	12/76	1/77	2/77	3/77	4/77	5/77	$\bar{X}$	SD
C.G.	.361	.242	.277	.392	.425	.322	.413	.308	.550	.317	.097
MCAS	.366	.375	.390	.406	.457	.480	.432	.469	.624	.444	.15

SLOPE RELATIONSHIP OF BEST FIT LINE = .3

$\frac{CP\ GEIGER}{MCAS} = 1 - .3 = 0.7$; $CG = .7\ MCAS$

TOTAL PLANT FLOW $CG + MCAS = .87$ MGD

$.7\ MCAS + MCAS = .87$

$MCAS = .87 / 1.7 = .51$ MGD

$\frac{.51}{3} = \frac{.06\ MG}{3\ HRS}$

VOL OF WATER FROM MCAS DURING 3 HR DESIGN FLOW (RAIN)

= .0964 MG (RAIN) + .06 MG (NORMAL)
= 0.1564 MG / 3 HRS

SWG PLANT CAP = 1.6 MGD / 8 = 0.2 MG / 3 HRS

SURGE BASIN = 5.5' DEEP, BOTTOM FOOT NOT USABLE

USABLE PART OF BASIN	USABLE DEPTH	USABLE VOLUME	+ PLANT CAP (.2MG)	% OF TOTAL CAP USED BY MCAS (.1564 MG)
EMPTY	5.5 - 1	.4 - .055 = .345 MG	.545 MG	29 %
1/4 FULL	5.5 - 2.125	.4 - .12 = .28 MG	.48 MG	32 %
1/2 FULL	5.5 - 3.75	.4 - .21 = .19 MG	.39 MG	40 %
3/4 FULL	5.5 - 4.375	.4 - .34 = .06 MG	.26 MG	60 %

NORMAL MCAS FLOWS % OF TOTAL = .51 / .87 = 58 %

58 % > ALL BUT 3/4 FULL SURGE BASIN

ENCL (7)

ENCL (7)

SCOPE OF WORK FOR INFILTRATION INFLOW CONTRACT

1. The Camp Geiger Sewage Treatment Plant at Camp Lejeune, North Carolina, becomes overloaded during heavy rainstorms. The designed capacity of the plant is sufficient for present needs, provided excess storm water hydraulic loads can be abated. This scope of work is to provide for a storm inflow investigation with cost estimates leading to the design and construction of corrective projects including pipe rehabilitation, lining, replacement, and deletion of storm connections. The investigation will be performed as outlined below.

a. Select suitable manholes from sewer drawings, and prepare Attachment (I). Start inspecting the selected manholes during a storm and complete rain flow information on the forms. Inspection of manholes during the rain should start at the upper locations and proceed downstream. The flow at each manhole should increase, but a significant increase in the flow indicates an inflow of water between manholes. An estimate of the time of concentration (TC) should be made for the manholes, and the storm water depths measured after TC. Complete flow information on the forms for the same manholes when it is not raining. This should be done the same time and week day as the rainstorm information.

b. Attachment II shows a method for determining flows from upper and lower manhole depth measurements provided no additional flow is added in the reach. Any additional flow will be apparent by calculating the flow into and out of a reach. The water depths alone can indicate excess water entering into a reach, but could be misleading and should be checked by flow calculations. (Attachment III)

c. The pipe reaches that are suspected of having storm inflow should be examined for connections to storm water collecting areas (by drainage maps and physical site inspections). Suspected areas can be smoke and dye tested using fire trucks for wash water. Smoke tests alone often fail to indicate storm connections when they are "water trapped". If possible, any TV inspections of these areas are to be done during rainstorms to locate and evaluate inflow points for grouting and/or reconstruction.

d. Copies of all data collected and recommendations made are to be forwarded to this office for assistance in their evaluation.

e. While this method is rain dependent and thus more time consuming, it should lead directly to the sources of inflow and eliminate the need of examining much of the system that is relatively trouble free. In addition, pipes connected to the sewers which drain rain collection areas are difficult to identify unless they are located during a rainstorm.

ATTACHMENT 1

DATE ..... SUBJECT ..... SHEET NO. ..... OF .....

CD. BY ..... DATE ..... JOB NO. .....

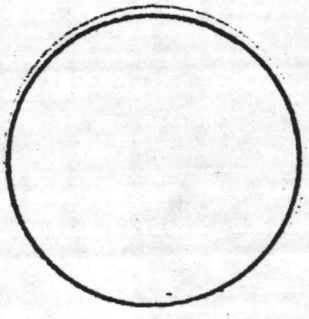
COLLECTION SYSTEM _____ PUMP STA. # _____

MANHOLE # _____

TOP OF M.H. EL. _____ (FT).

DEPTH OF M.H. _____ ((FT)

TIME OF CONC. (TC) _____ (MIN)



[1] TYPE OF MAT. _____

RAIN - DEPTH _____ (IN)

DATE _____

DAY/TIME _____/_____

DRY - DEPTH _____ (IN)

DATE _____

DAY/TIME _____/_____

[2] TYPE OF MAT _____

RAIN - DEPTH _____ (IN)

DATE _____

DAY/TIME _____/_____

DRY - DEPTH _____ (IN)

DATE _____

DAY/TIME _____/_____

[3] TYPE OF MAT _____

RAIN - DEPTH _____ (IN)

DATE _____

DAY/TIME _____/_____

DRY - DEPTH _____ (IN)

DATE _____

DAY/TIME _____/_____

[4] TYPE OF MAT. _____

RAIN - DEPTH _____ (IN)

DATE _____

DAY/TIME _____/_____

DRY - DEPTH _____ (IN)

DATE _____

DAY/TIME _____/_____

USE 2nd SHEET FOR MORE THAN 4 PIPES

ATTACHMENT I

BY: DATE: SUBJECT: NAUSTA ROOSEVELT, P.R. SHEET NO. OF

CHKD. BY: DATE: JOB NO.

COLLECTION SYSTEM CAPEHART PUMP STA # 2

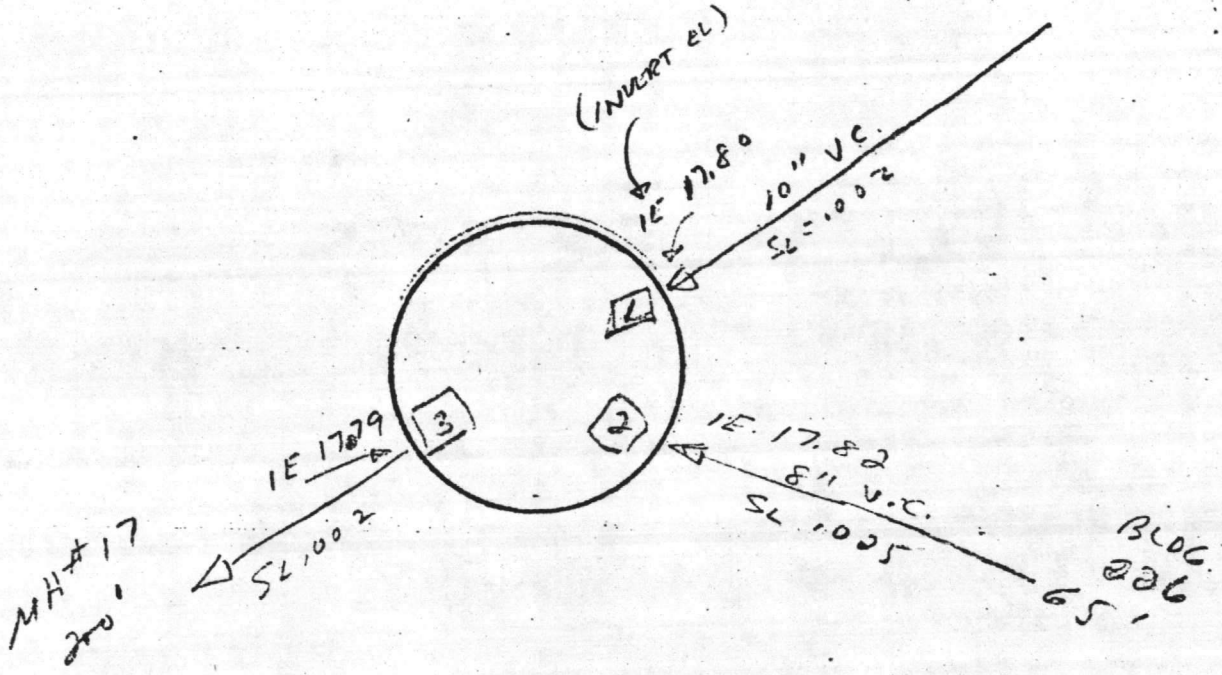
MANHOLE # 16

TOP OF M.H. EL. 24.23' (FT).

DEPTH OF M.H. 6.44' (FT)

TIME OF CONC. (TC) 8 (MIN)

SAMPLE OF ATTACHMENT #1 COMPLETED



[1] TYPE OF MAT. VCP
RAIN-DEPTH 3 (IN)
DATE 2/15/79
DAY/TIME THUR / 1425
DRY-DEPTH .6 (IN)
DATE 2/22/79
DAY/TIME THUR / 1430

[2] TYPE OF MAT VCP
RAIN-DEPTH 5 (IN) ← A
DATE 2/15/79
DAY/TIME THUR / 1425
DRY-DEPTH .05 (IN) ← A
DATE 2/22/79
DAY/TIME THUR / 1430

[3] TYPE OF MAT VCP
RAIN-DEPTH 3.2 (IN)
DATE 2/15/79
DAY/TIME THUR / 1425
DRY-DEPTH 1.0 (IN)
DATE 2/22/79
DAY/TIME THUR / 1430

[4] TYPE OF MAT.
RAIN-DEPTH (IN)
DATE
DAY/TIME /
DRY-DEPTH (IN)
DATE
DAY/TIME /

NOTE A - PIPE [2] MAY BE CONNECTED TO ROOF DOWN DRAIN, PARKING LOT, FOUNDATION DRAIN ETC. — CHECK FOR EXCESS RAIN WATER.

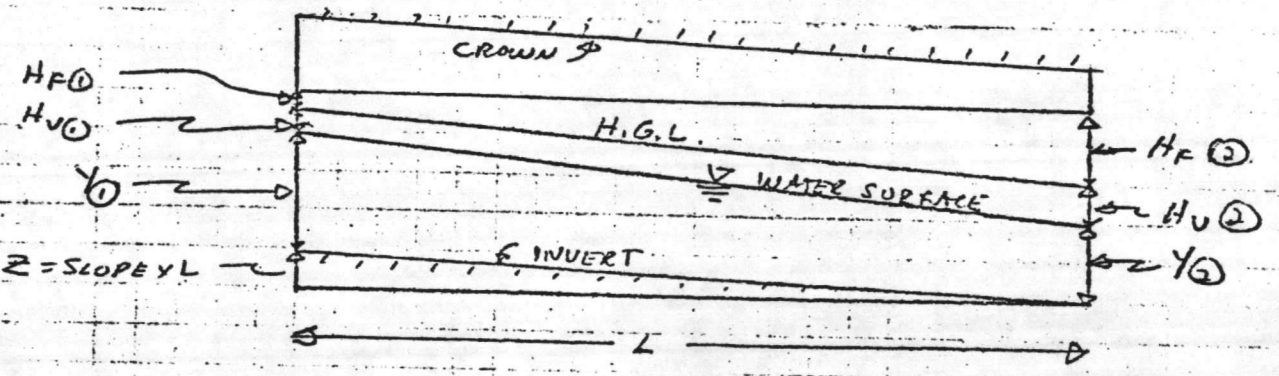
(USE 2nd SHEET FOR MORE THAN 4 PIPES)

ITEM 11

DATE ____ SUBJECT CALCULATION OF NON UNIFORM-OPEN CHANNEL FLOW IN A PIPE.

CHKD. BY ____ DATE ____ SHEET NO. ____ OF ____ JOB NO. ____

M.H. ① n = MANNINGS N. M.H ②



1. FROM $Y_①$, CAL $A_①^2$, $R_①^{4/3}$ FROM $Y_②$, CAL $A_②^2$, $R_②^{4/3}$

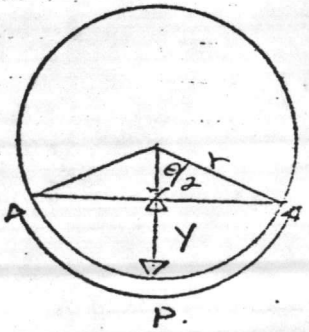
2. CAL $K_V = \frac{1}{64.4}\left(\frac{1}{A_②^2} - \frac{1}{A_①^2}\right)$

3. CAL. $K_F = \frac{n^2 L}{4.44}\left[\frac{1}{A_①^2 R_①^{4/3}} + \frac{1}{A_②^2 R_②^{4/3}}\right]$

4) CAL $Y_① + Z - Y_②$, IF NEGATIVE, FLOW IS TO LEFT ←

5. CAL $Q(CFS) = \sqrt{\left|\frac{Y_① + Z - Y_②}{K_V \pm K_F}\right|}$

NOTE: IF $Y_① + Z - Y_②$ IS + FLOW →
" " " " " − FLOW ←



TO CALCULATE A + R FROM WATER DEPTH IN A PIPE

$\frac{\theta}{2} = \cos^{-1}\left(1 - \frac{Y}{r}\right)$ RADIANS ; $P = r\theta$

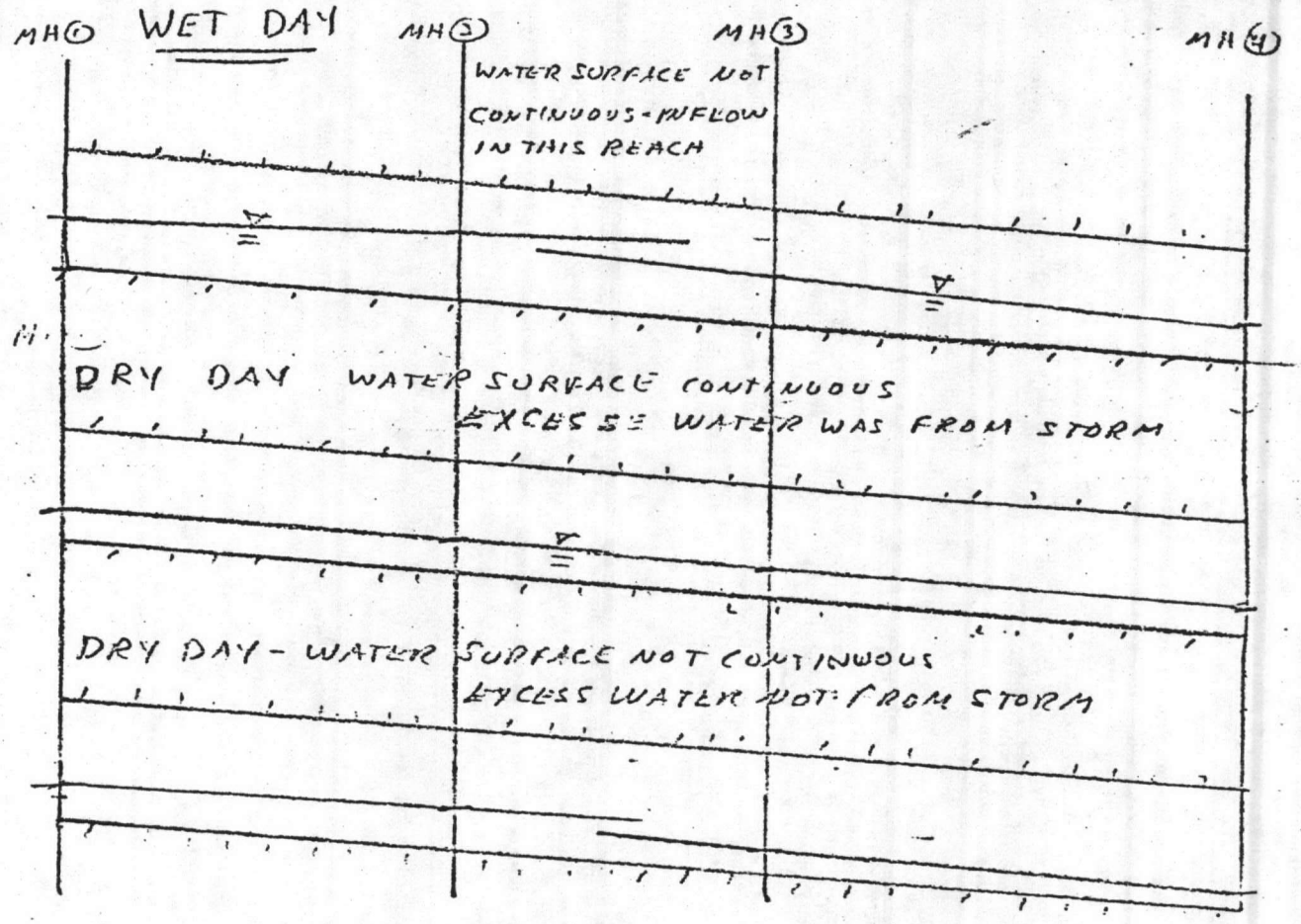
$A = \frac{r^2}{2}(\theta - \sin\theta)$ $R = \frac{A}{P}$

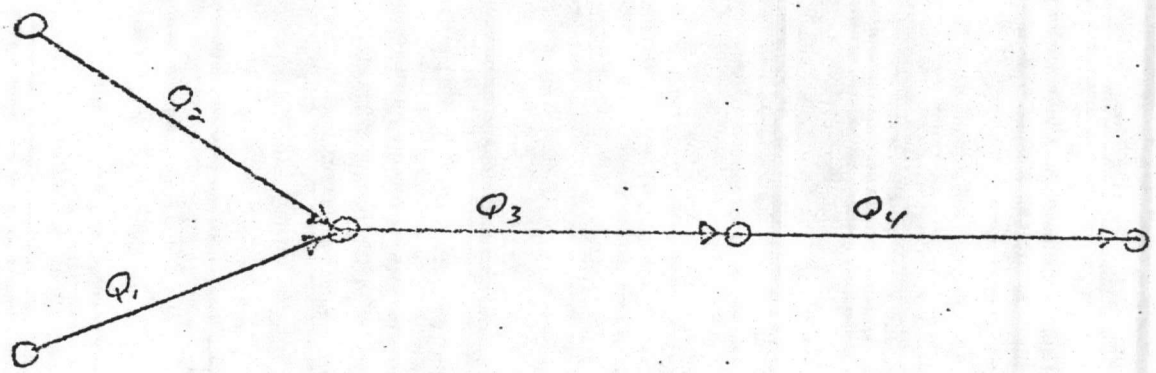
NOTE: CALCULATIONS CAN BE QUICKLY PERFORMED ON AN ELECTRONIC CALCULATOR WITH TRIGONOMETRIC FUNCTIONS, ESPECIALLY IF THE CALCULATOR IS PROGRAMMABLE

ATTACHMENT III

DATE ..... SUBJECT LOCATING REACHES WITH EXCESS STORM WATER INFLOWS ..... SHEET NO. ..... OF .....

CKD. BY ..... DATE ..... JOB NO. .....





IF $Q_4 >> Q_1 + Q_2$ THEN REACH OF Q_3 IS RECEIVING EXCESS WATER.