COPY

Iowa department of water, air and waste management

August 16, 1984

RECORD COPY
File Name Van Wert - xw
Senders Initials JH

McClure Engineering Company
705 First Ave. North
Fort Dodge, IA 50501

RE: Sewerage System for the City of Grand River
and City of Van Wert

Gentlemen:

Your letter of July 19, 1984, formally requesting variances from our design standards for Grand River & Van Wert, has been reviewed. In light of the facts and figures presented in your letter regarding your estimated wastewater flows and BOD_5 loadings, the design criteria and our analysis of recently built collection systems does not justify altering our position on these issues. Also, experience has shown that when cities install their water distribution systems, water usage will increase.

Rip-rap is an essential part of the lagoon system. Lagoon dikes will eventually be damaged, due to wave action, if the rip-rap is not in place.

Since the request for a variance to lower the design sewage flow from 100 gallons per capita per day (gpcd) to 85 gpcd, to lower the design BOD_5 from 0.17 pound per capita per day to 0.15 pounds per capita per day, and to delete rip-rap for the dikes would not result in at least equivalent effectiveness, the request is hereby denied. If you have any further questions or comments, you may contact this department.

Sincerely,

Stephen W. Ballou
Executive Director

SWB:mla

cc: City Clerk, City of Grand River
City Clerk, City of Van Wert
Region 5

McCLURE ENGINEERING COMPANY
CONSULTING ENGINEERS
705 FIRST AVENUE NORTH FORT DODGE, IOWA 50501 PHONE 576-7155 AREA 515

July 19, 1984

Mr. Steve Ballou
Iowa State Dept. of
Water, Air & Waste Management
Henry A. Wallace Bldg.
900 East Grand
Des Moines, IA 50319

Re: Van Wert Sewerage System
Grand River Sewerage System

Dear Steve:

This formal request for variances from WAWM Design Standards is being made to you on behalf of the two referenced communities. We have made our original request and met with your department staff on March 13, 1984. A letter dated April 18, 1984 from a staff Engineer basically rejects all of our initial requests.

At this time, both communities have been funded by the Office of Planning and Programming (O.P.P.) and the Farmers Home Administration (FmHA). FmHA funded the projects based on our cost estimates for alternative construction. Below is a breakdown of the project financing.

	Van Wert	Grand River
O.P.P. Grant	$180,000.00	$170,000.00
FmHA Grant	218,000.00	244,400.00
FmHA Loan	166,000.00	166,000.00
Total Project	$564,000.00	$580,400.00

The cost to the community to repay the loan and operate and maintain the system is estimated at $15.00/User/Month. The median family income in each community is less than $10,000.00/year. With the financing available, each community is prepared to install the systems, however, because the rates are already high, they are looking for ways to keep the cost of the project to a minimum. Costs in excess of the estimated amount will directly increase the FmHA loan, raising the sewer rates.

Following are the items we are proposing to design that currently require a variance from WAWM. Again, the purpose of these design alternatives are to keep the construction costs to a minimum, while providing adequate sewage treatment.

1. As concurred by WAWM, only first floor service will be provided.

2. Originally we requested using 80 gpcd design flow versus 100 gpcd, 0.15 lbs.-BOD/person versus 0.17 lbs., and a BOD loading rate of 30 lbs. per acre rather than 25 lbs. The intent, of course, is to reduce the size of the treatment lagoon. In very small communities, we feel the Design Standards yield a lagoon size larger than necessary for adequately treating the wastes.

   a. Currently, neither Van Wert or Grand River have water systems. Estimating water use in these towns is difficult, however, it is probably quite low. We are working in the City of Hartford which recently constructed a water system and their water use is approximately 60 gpcd. I am sure without a water system, Van Wert and Grand River must be below 60 gpcd, however, we will assume this rate. If we also assume 80% of the water used enters the sewer system, the wastewater production rate from the residents would be:

   $$60 \text{ gpcd} \times 0.80 = 48 \text{ gpcd}$$

   $$48 \text{ gpcd} \times 270 \text{ capita} = \underline{12{,}960 \text{ gal/day}}$$

   By installing the sewer lines to serve only first floors, the average depth of the lines will be approximately 5.5 to 6.0 feet. The Infiltration at these depths should be less than Infiltration at depths of 9 to 10 feet on standard sewer lines. Again, it is difficult to estimate Infiltration/Inflow rates, but initially the sewer mains will be constructed and air tested for leakage rates less than 200 gallons per inch of pipe diameter per mile of pipe length (gal/in/mi). Realizing this leakage rate will increase in time, to estimate the I/I, if we use 300 gal/in/mi., we assume the I/I for the mains as follows:

   $$\frac{15{,}400 \text{ ft.}}{5{,}280 \text{ ft.}} \times 8 \text{ in.} \times 300 \text{ gal.} = 7{,}000 \text{ gal/day}$$

Assuming 10,000 ft. of 4 inch service lines at the same leakage rate:

$$\frac{10{,}000 \text{ ft.}}{5{,}280 \text{ ft.}} \times 4 \text{ in.} \times 300 \text{ gal.} = 2{,}300 \text{ Gal/Day}$$

Below summarizes the estimated flow:

Residential Flow	13,000 Gal/Day
I/I Sewer Mains	7,000 Gal/Day
I/I Service Lines	2,300 Gal/Day
Total Flow	22,300 Gal/Day

Per Capita Design Flow = $\frac{22{,}300}{270}$ = 83 gpcd

It is our recommendation the City implement a program to have all service lines inspected prior to being connected to the sewer system. Because most homes in the communities do not have usable basements, footing drain connections should not be a big problem. All lines should be inspected by an Engineer to insure downspouts or other drainage devices are not connected to the system.

b. Because each community is completely residential, we propose using 0.15 lbs.-BOD/Day as was allowed under the previous IDEQ Standards. Using 0.15 lbs.-BOD/Day we would propose using 25 lbs.-BOD/Acre for the primary cell. Originally, we requested 30 lb.-BOD/Acre, however, with an allowance of 85 gpcd and 0.15 lbs.-BOD/Acre, the additional 5 lbs.-BOD/Acre on the primary cell will not yield a significant decrease in the total lagoon size.

To summarize, the Design loadings proposed are as follows:

*Wastewater Production Rate	85 gpcd
*Per Capita Loading Rate	0.15 lb.-BOD/Day
Organic Loading Rate	25 lb.-BOD/Acre
Hydraulic Retention Time	180 Days

*Varies from Design Standards

NO!

3. Previously, a variance was requested to allow Rip-Rap not to be installed. Our original cost comparisons did not include Rip-Rap in either alternative. To install Rip-Rap in the lagoons in accordance with WAWM Standards, it would increase the cost approximately $50,000.00 per project.

   We propose to include Rip-Rap in the project bid and offer seeding as an erosion protection alternative. Because of the small size of the lagoons, wind action should be minimal. Rip-Rap could always be placed as needed in the future in isolated areas. If there is enough money in the project, Rip-Rap would be installed.

Below are the cost savings each community can realize if the variances are granted.

	Design for WAWM Standards		With Variances
Van Wert			
Collection System	$420,650.00		$373,900.00
Treatment Lagoon	213,700.00		190,100.00
(Rip-Rap)	50,000.00		0.00
Total Project	$684,350.00		$564,000.00
Estimated Savings		$120,350.00	
Grand River			
Collection System	$436,300.00		$393,010.00
Treatment Lagoon	206,200.00		187,350.00
(Rip-Rap)	50,000.00		0.00
Total Project	$692,500.00		$580,360.00
Estimated Savings		$112,140.00	

Steve, we do feel our requests are justified. With the current financing available, a concurrence with our request will allow two unsewered communities in our State to obtain proper sewage treatment. Because of the reasons sited, as well as their southern location within our State, we believe our requests will not pose a threat to the surrounding environment. Most importantly, it will clean up existing potential health problems at costs the communities are prepared to pay.

I would be happy to meet with you, O.P.P. or FmHA to discuss our requests, if you wish. Because funding on the projects is in place, we are starting on the field work, and would like to begin final Design immediately.

Very truly yours,

McCLURE ENGINEERING COMPANY

Terry J. Lutz, P.E.

TJL:lg

cc: FmHA - Indianola
FmHA - Des Moines
City of Van Wert
City of Grand River

RECORD COPY

File Name Van Wert - Sewage

Senders Initials MM

Iowa department of water, air and waste management

-11 18, 1984

COPY

:y Clerk
:y Hall
ı Wert, IA 50262

TENTION: Honorable Mayor & Council

ıtlemen:

: Preliminary Report for Sanitary Sewerage System for the City of Van Wert

have completed the review of the Preliminary Report and Supplemental Report sanitary sewerage system for the City of Van Wert, submitted to this ıartment by your engineers, McClure Engineering Company of Fort Dodge, Iowa. ır engineer's representative and Farmers Home Administration representatives with this Department staff on March 13, 1984 at Wallace Building, Capitol ıplex, Des Moines, Iowa to discuss the subject preliminary report. We hereby irm our position on the subject report.

1. This Department does appreciate your good intent to provide sanitary sewer and water services to the residents of the City of Van Wert.

2. Your engineer's recommendations of not to provide sewer services to the basements of the residences in your city is contrary to Article 12.5.2 of Chapter 12 of Iowa Wastewater Facilities Design Standards. The Department will give favorable consideration of the proposal.

3. By a supplement to the preliminary report for sanitary sewerage system for the City of Van Wert, your engineers have proposed the following:

   A. Use 6 inch sanitary sewers instead of 8 inch sanitary sewers for the collection sewer system.

   B. Use daily domestic organic loading of 0.15 pounds of BOD per person per day instead of 0.17 pounds of BOD per person per day and

   C. Increase the BOD loading to 30 pounds per acre instead of 25 pounds per acre of the controlled discharge pond surface area.

W109F03.01

ll of the three proposals are contrary to the Design Standards Article 12.5.1 f Chapter 12, Articles 18C.4.2 and 18C.5.2 of Chapter 18C of Iowa Wastewater acilities Design Standards and are not acceptable by this Department.

ou may contact this Department at 515/281-8960 if you have any further questions egarding the referenced preliminary report.

ıincerely,

'ROGRAM OPERATIONS DIVISION

lkanad M. Koshy
Staff Engineer
Wastewater Permits Branch

MK:mla/WWPW109F03.02

:c: McClure Engineering Co., Ft. Dodge, Iowa
Region 5
FmHA

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File Name VanWert - Sewage

Senders Initials WDM

STATE OF IOWA
DEPARTMENT OF WATER, AIR AND WASTE MANAGEMENT
HENRY A. WALLACE BUILDING
DES MOINES, IOWA 50319

PRELIMINARY ENGINEERING REPORT ACCEPTANCE

ity Clerk
ity Hall
anWert, Iowa 50262

Project No: S84-173

File: VanWert - Sewage

Re: San: Sewer Collection & Treatment System

e have completed our review of the preliminary engineering report for the above referenced project. We are n general agreement with the concepts, conclusions, and recommendations contained in this report.

owever, we would like to offer the following comments:

. Public gravity sanitary sewer shall be minimum of eight (8) inches in diameter.

. Minimum average Dry Weather Flow of one hundred (100) gallons per capita per day and a BOD_5 equivalent of 0.17 pounds per capita per day shall be used for the design of the sewer system and the wastewater treatment facility.

. Rip Rap shall be used to protect the dikes of the lagoons.

n accordance with the rules of this Department, plans and specifications for the proposed facility must be ubmitted to this Department for review and issuance of a construction permit prior to construction of such acilities. The plans and specifications should be in concurrence with the preliminary engineering report as ccepted. Any deviation from the facility design as outlined in the engineering report must be identified and ccompanied by an explanation detailing the reasons for modifications.

ontact Akanad M. Koshy at 515/281-8960 with any questions or comments.

By: Larry Haage
PROGRAM OPERATIONS DIVISION

Date: January 18, 1985

c: McClure Engineering Co., Fort Dodge, IA
Region 5

MK:pla/WWPW016M08.01

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Engineer; 1 Region; 1 File