jpb ✓ 9/6/06

VARIANCE REQUEST

18C.4.1

Iowa Department of Natural Resources

1. Date	: 6/11/91	13. Decision:	Denied
2. Review Engineer	: Fred Evans	Date:	6-14-91
3. Date Received	: 2/21/91		
4. Facility Name	: Hillsboro	14. Appeal:	
5. County Number	: 44	Date:	
6. Program Area	: CP		
7. Facility Type	: C05		
8. Subject Area	: 300		
9. Rule Reference	: 64.2(9)		
10. Design Std. Ref.	: 18C.4.1 & 12.3.1.1		
11. Consulting Engr.	: French-Reneber-Associates, Inc.		
12. Variance Rule	: 64.2(9)c		

15. Description of Variance Request

The City of Hillsboro does not have a comprehensive waste water collection and treatment system. The designing engineer is proposing that the design of a proposed wastewater treatment plant be based upon actual water usage plus an allowance for infiltration in lieu of the minimum basis of design criteria set forth in Sections 12.3.1.1 and 18C.4.1 of the design standards. City records for calender year 1990 indicate a municipal water usage of approximately 48 gpcd. Based upon the proposed sanitary sewer system and an infiltration rate of 200 gallons per day per inch mile of pipe the engineer calculates an additional 30 gpcd for the maximum infiltration rate, and, therefore, requests a variance to design for a flow of 78gpcd in

16. Consulting Engineer's Justification

lieu of the required 100 gpcd value.

1. Small municipal wastewater collection systems (including building laterals), properly designed and constructed in accordance with current requirements, can be expected to produce less than 100 gpcd of wastewater.

16. Consulting Engineer's Justification (cont.)

17. Department's Justification It is recommended that the requested variance be denied since the engineer does not provide adequate engineering justification. His premise for requesting a variance is based upon a status quo situation where there will be no increase in future per capita water usage, also no increase in loadings from future growth in the community, where adequate control of service connections will be provided to prevent any increase in I/I, and where adequate maintenance of the sewer system will be provided to prevent or rehabilitate any possible deterioration of sewers and manholes. Such variables are unpredictable in small communities such as Hillsboro and any or all of the above causes for increased hydraulic loadings could occur. This is particularly critical in small communities (including Hillsboro) which are funded by FmHA, since such funding includes loans which are spread over a 40 year period. The repayment of such loans severely limits the funding capabilities of these communities if expansion of the wastewater treatment facilities is required during the funding period. Also most of the FmHA funded projects are designed on the basis of existing populations during the initial design

18. Precedents Used Past variance requests for use of per capita flow values of less than 100gpcd for design of municipal wastewater treatment facilities have been denied for the Cities of Hartford, Grand River, Van Wert, Shambaugh, New Providence, Fort Atkinson and Burr Oak.

19. Staff Reviewer	: Fred Evans	Date: 6/13/91
20. Supervisor	:	Date: 6/13/91
21. Authorized by	:	Date: 6/14/91

STATE OF IOWA

TERRY E. BRANSTAD, GOVERNOR

DEPARTMENT OF NATURAL RESOURCES
LARRY J. WILSON, DIRECTOR

July 19, 1991

French-Reneker Associates, Inc.
1501 South Main Street
P.O. Box 135
Fairfield, IA 52556

ATTENTION: David H. Fredericks, P.E.

SUBJECT: Variance Request
Wastewater Collection & Treatment
Hillsboro, Iowa

Gentlemen:

The Iowa Department of Natural Resources, in accordance with subrule 567--64.2(9) of the Iowa Administrative Code, has denied the request for a variance from Iowa Wastewater Facilities Design Standards sections 12.3.1.1 and 14.4.5.3. These sections of the design standards require that the hydraulic design of sanitary sewers and wastewater treatment facilities to serve new collection systems be based upon a minimum flow value of 100 gpcd for the design average flow.

The engineering justification submitted does not substantially demonstrate that the requested variance from our minimum per capita flow allowance would provide for equivalent or improved effectiveness. Your premise for requesting a variance is apparently based upon a status quo situation whereby there will not be any increase in future per capita water usage; also no increase in loadings from future growth in the community; where adequate control of service connections will be provided to prevent any increase in infiltration and prohibit connection of inflow sources; and where adequate maintenance of the sewer system will be provided to prevent or rehabilitate any possible future deterioration of sewers and manholes. Such potential causes for increased hydraulic loadings in small communities are difficult to predict and control over the long period of time that the sewerage facilities are designed to serve the communities.

It has been the experience of this department that any one or more of the above causes for increased hydraulic loadings in small communities can and do occur. This is particularly critical in small communities (including Hillsboro) which are partially funded by FmHA since such funding includes loans which are repaid over a 40 year period. The repayment of such loans severely limits the funding capabilities of these communities if expansion of

the wastewater treatment facilities is required during the funding period for the initial facilities. In this regard, it should also be noted that most of FmHA funded projects are designed on the basis of existing populations at the time of the initial design, and, therefore, do not include any allowances for future growth in the communities.

If you have any questions, please feel free to contact Fred M. Evans at 515/281-8995.

Sincerely,

DARRELL McALLISTER, BUREAU CHIEF
SURFACE & GROUND WATER PROTECTION BUREAU

DM:FME:pla/FRENCH1

cc: Field Office 6

FRENCH - RENEKER - ASSOCIATES, Inc.

Donald E. French, (1921-1982)

1501 S. MAIN STREET PO BOX 135 FAIRFIELD, IOWA 52556 515-472-5145

CONSULTING ENGINEERS

W. Daniel Reneker, PE • James I. Warner, PE

Kenneth D. Bucklin, PE-LS • David H. Fredericks, PE • Jerry W. Long, PE

February 19, 1991

Mr. Fred Evans
Wastewater Permits Section
Iowa Dept. of Natural Resources
900 East Grand
Des Moines, Iowa 50319

Re: Hillsboro Sewerage Preliminary
Engineering Report (90-40)

Dear Fred:

We are conducting some further work on the above referenced project and, on behalf of the City of Hillsboro, request a variance to the hydraulic design factor of 100 gallons per capita per day (gpcd) as found in IDNR Design Chapter 12.3.1.1. By using a lower hydraulic design factor, it may be possible to incrementally reduce the size of the treatment system, and thus lower its cost.

Arbitrarily reducing treatment system capacity to lower its construction cost is inconsistent with good engineering practice. However, small municipal wastewater collection systems (including building laterals), properly designed and constructed in accordance with current requirements, can be expected to produce less than 100 gpcd of wastewater.

The following analysis will help to document our position. In calendar year 1990, the total metered water use for the 74 water meters in Hillsboro was 2,864,000 gallons. By actual count, the 74 water meters serve a population of 154. Consequently, the municipal water usage is approximately 48 gpcd. Not all buildings in Hillsboro (either occupied now or capable of being occupied) are connected to the municipal water system. By a recent City Council count, there are an additional 24 buildings that could be connected to the proposed wastewater system. These additional 24 connections should have no effect upon the per capita hydraulic design flow that is used.

By recent City Council count, the total Hillsboro population is 188, which is higher than the 1990 census figures of 151. Hillsboro is appealing the 151 figure. The 1980 census was 208.

There will be infiltration with any wastewater collection system, so an allowance must be added to the water usage figures to obtain the wastewater design flow per person. For new collection systems, the IDNR design requirements limit the infiltration to not more than 200 gallons per day per inch mile of pipe.

For the collection and interceptor sewer layout in the Preliminary Engineering Report (including an allowance for individual building laterals), there are approximately 28.3 inch miles of sewer pipe. Therefore, the maximum allowable infiltration rate would be approximately 5,700 gallons per day, or 30 gpcd. Combining the water usage (48 gpcd) and maximum infiltration allowance (30 gpcd) results in a proposed wastewater design flow of 78 gpcd.

We request that a variance be granted to allow 78 gpcd to be used for calculating the Hillsboro wastewater treatment plant design flow.

The calculation of the total design flow will depend upon the number of people that will be connected to the system and any allowance for future growth.

Very truly yours,

FRENCH-RENEKER-ASSOC., INC.

David H. Fredericks, P.E.
Project Engineer

DHF/jc
cc: City of Hillsboro
Jim Carroll, FmHA - Des Moines
Wayne Farrand, IDNR - Des Moines