

✓ 9-8-06 Variance File ch. 15

VARIANCE REQUEST

Iowa Department of Natural Resources

1. Date: October 8, 2003	13. Decision:
2. Review Engineer: Satya P. Chennupati	Date:
3. Date Received: February 20, 2002	
4. Facility Name: City of Carroll STP	14. Appeal:
5. County Number: 14	Date:
6. Program Area: CP (Wastewater Construction)	
7. Facility Type: C04 (Physical Treatment)	
8. Subject Area: 329	
9. Rule Reference: 567-64.2(9)a	
10. Design Stds Ref: 15.2.4.2.1	
11. Consulting Engr: Veenstra & Kimm, Inc.	
12. Variance Rule: 567-64.2(9)c	

15. Description of Variance Request: Allow installation of a mechanically cleaned bar screen with 1/4" clear spacing instead of the minimum 5/8" clear spacing required by the Iowa Wastewater Design Standards.

16. Consulting Engineer's Justifications

- Small size screen opening to remove plastic material from the wastewater flow in the screening process.
- Plastic material accumulates in the digesters and is ultimately land applied with biosolids. Local landowners are objecting to the plastics in the biosolids thereby making it difficult to land apply.
- The proposed screen has an automatic washer to separate organic materials and specifically remove non-organic material.

17. Department's Justifications

- Recommend Approval.
- Successful past operating history in several municipal wastewater treatment installations in Iowa.
- Mechanical screens with openings less than 5/8" are an accepted engineering design practice.
- Ten States Standards (1997) does not specify minimum size of screen openings.

18. Precedents Used

Walford, Clear Lake S.D., Osage, Tama, Newton, Altoona, Cherokee, West Liberty, Waukee, etc.

19. Staff Reviewer: <i>Satya Chennupati</i>	Date: <i>10/8/03</i>
20. Supervisor: <i>[Signature]</i>	Date: <i>10/8/03</i>
21. Authorized by:	Date:



STATE OF IOWA

THOMAS J. VILSACK, GOVERNOR
SALLY J. PEDERSON, LT. GOVERNOR

DEPARTMENT OF NATURAL RESOURCES
JEFFREY R. VONK, DIRECTOR

October 8, 2003

Mr. Gerald L. Clausen
City Manager
112 East 5th Street
Carroll, Iowa 51401-2799

Subject: Variance Request from IA 15.2.4.2.1
Wastewater Treatment Plant Improvements, Carroll, Iowa
SRF Project No. CS192146-01

Dear Mr. Clausen:

The Iowa Department has considered and approved your February 14, 2002 request for a variance from Rule 567-64.2(9)b of the Iowa Administrative Code and Chapter 15.2.4.2.1 of the Iowa Wastewater Facilities Design Standards, which requires a minimum 5/8 inch opening for the mechanically cleaned bar screen. Based on the documentation presented by the City, it is the determination of this Department that satisfactory justification has been presented to warrant the granting of a variance to the City of Carroll for using a minimum clear opening of 1/4-inch for the mechanically cleaned bar screen.

This decision is based on our review of justification presented to support the request and our concurrence that the resulting project will provide substantially equivalent effectiveness as would be provided by technical compliance with the design standard on this issue.

If you have any questions, please call Satya P. Chennupati, P.E. at 515-281-8995.

Sincerely,

A handwritten signature in black ink, appearing to read "Wayne Farrand", written over a horizontal line.

Wayne Farrand, P.E.
Wastewater Section Supervisor

cc: Field Office #4
Veenstra & Kimm, Inc.
DNR File

City of Carroll

112 E. 5th Street

Carroll, Iowa 51401-2799

(712) 792-1000

FAX: (712) 792-0139

February 14, 2002

Mr. Terry L. Kirschenman, P.E.
Iowa Department of Natural Resources
Wastewater Section
Wallace State Office Building
Des Moines, Iowa 50319

Re: Wastewater Facility Plan Comments

Dear Terry:

This letter attempts to provide responses to the May 1, 2001, comments on the Facility Plan plus those comments that have been received since that time regarding the Facility Plan. Some of the individual comments have been verbally discussed and some responses have been previously submitted in written form. In those cases, this response attempts to summarize those previous discussions or letters. Some of the comments have not been previously addressed. For those, this response attempts to include currently available information.

The responses below follow the same numbering system as the original comment letter.

1. Interested groups, individuals and the local newspapers for distribution of the Finding of No Significant Impact document are as follows:

Name

Address

Groups:

Carroll County Sanitarian	Rt. 2, Box 702	Carroll, IA 51401
M & T Rentals	920 N. Crawford St.	Carroll, IA 51401

Individuals:

Ron Becker	703 N. East St.	Carroll, IA 51401
Luverne Hoffman	201 S. Walnut St.	Carroll, IA 51401
Stefanie Tuel	1003 Quint Ave.	Carroll, IA 51401
Donald Kanne	426 S. Main St.	Carroll, IA 51401
David Schapman	1625 Marcella Hts. Dr.	Carroll, IA 51401

rulemaking and public hearings. Design flows of 1.7 mgd ADW and 4.4 mgd AWW were used in the calculations. Effluent copper levels compared to current permit limits and example wasteload allocations for the past two calendar years are as follows:

See Table on Page 7

It is currently planned to continue discharge to Lateral Number 77 based on the example wasteload allocations and the incidental copper removal anticipated by the proposed wastewater treatment process. If this is not acceptable, a forum in which to resolve this issue is requested. A resolution will require input from appropriate decision-makers in a position to decide this issue with finality.

14. See #5.

15. The requirements for a 150% recycle rate at the AWW design flow will be met. The design of the vertical loop reactor system has been carefully reviewed with the system manufacturer. The system manufacturer has indicated increasing the final clarifier size from 75-foot diameter to 80-foot diameter is not advisable. The manufacturer has recommended other modifications in the system design criteria to meet the design standards.

To meet the design standards, it is proposed to increase the size of the aeration tanks by lengthening the tanks from 94 feet to 110 feet. This change will increase the aeration tank volume from 1.12 mg to 1.23 mg.

To meet the design criteria the design assumptions for primary treatment and aeration tank design have been evaluated. It is proposed to increase the primary treatment removal to 30%. This increase is allowable under the Iowa Department of Natural Resources design standards.

It is proposed to increase the F/M ratio from 0.10 to 0.16. In conjunction with the change in the F/M ratio the mixed liquor to suspended solids (MLSS) design level will be reduced to 2,018 mg/L.

To meet the criteria it is proposed to increase the size of the aeration tanks, increase the design removal in the primary clarifiers, to increase the F/M ratio and to decrease the MLSS level. With the four modifications it is believed that the system meets the design criteria as set forth in the design standards.

- * 16. A design variance for the mechanical bar screen is requested. The City is aware the design standards require a minimum screen opening of 5/8-inch. A variance to allow the mechanical bar screen to be designed with a 1/4-inch opening is requested.

The purpose for the small 1/4-inch opening on the mechanical bar screen is to remove plastic material from the wastewater flow. A 5/8-inch mechanical bar screen does not removal all of the plastic material from the wastewater flow. The plastic material accumulates in the digesters and is ultimately land applied. One of the primary objections of local landowners to the land application of biosolids is the plastic material within the biosolids. The goal in reducing the design opening of the bar screen is to eliminate the problem with plastic material by removing the plastic during the screening process.

The screen proposed for the wastewater treatment plant includes an automatic washer to remove organic materials. The screen is designed specifically to remove non-organic material. This design reduces the screening volume to a manageable level. The City requests a design variance to allow the 1/4-inch spacing at the bar screen.

The clear opening bar spacing on the manual bar screen is 1.75 inches.

17. The detention volume in the proposed vortex grit removal system is 0.49 minutes, or approximately 30 seconds.
18. The design of the aeration system has not been completed. The peak 4-hour oxygen requirement will be established during the final design of the aeration system. If the sizing of the aeration tanks and clarifiers are resolved under item number 15, the design of the aeration system will proceed. Information on the peak 4-hour oxygen requirement will be transmitted to you as soon as it has been calculated.
19. Veenstra & Kimm, Inc.'s July 5, 2001, response to the May 1, 2001, comment letter set forth information on the BOD₅ removal efficiency of the primary clarifier. The response indicated the design was based on a 20% removal of BOD₅ in the primary clarifier. As set forth in the response to Comment No. 15 the removal efficiency of the primary clarifier has been increased to 30%.

The revised BOD₅ and suspended solids removal efficiency of the primary clarifiers is 30% and 60% respectively for all flow ranges. Also approximately 17% of the influent TKN is removed in the primary sludge. The anticipated loadings to the aeration tanks in pounds per day based on the primary clarifier removal of influent loadings are:

	AWW (ppd)	MWW (ppd)
BOD ₅	3,315	4,997
Suspended Solids	1,927	3,597
TKN	847	1,216

Terry Kirschenman, IDNR
February 15, 2002
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27. Sludge is periodically removed from the sludge storage lagoon and applied to farmland for final disposal.
28. The Wastewater Facilities Financial Information Sheet has been completed and forwarded along with the financial capability certification letter to Wayne Farrand. A copy is attached.

The 1989 median household income in Carroll as reported in the 1990 census was \$25,870 per household.

29. The City is aware of the requirement for operation, maintenance and replacement costs to be established on a proportional basis. The operation, maintenance and replacement costs are proportional except for two special agreements previously approved by the City. The largest agreement is with Farmland Foods, Inc. Farmland Foods, Inc. has announced the closure of its facility in Carroll in July, 2003. It is anticipated the special agreement with Farmland Foods, Inc. will be terminated at the time of closure of its facility. The Carroll facility is scheduled for closure prior to the completion of the proposed Facility Plan improvements.

The second agreement is for accommodating the leachate from the landfill. The leachate charges were established based on the unique characteristics of the waste. The rate charged for the leachate is considered a separate user class based on the unique characteristics of the waste. It does not appear the agreement with the local landfill for leachate treatment provides a subsidized rate. The leachate treatment rate appears to meet all of the requirements for proportional rates based on user classification.

30. A copy of the City's current ordinance on user charge rates was forwarded on July 5, 2001, with a request for review of the ordinance provisions. If any deficiencies in the existing user charge system are identified, they will be addressed by ordinance amendment.

I hope that this attempt to address the May 1, 2001, comments is satisfactory. If you have any questions, please contact me or H.R. Veenstra, Jr., Veenstra & Kimm, Inc.

Sincerely,

CITY OF CARROLL



Randall M. Krauel
Director of Public Works

RMK:ds

enclosures (5)

cc: H.R. Veenstra, Jr., Veenstra & Kimm, Inc.