

✓ 9-11-06

13.4.2

VARIANCE REQUEST

Iowa Department of Natural Resources

1. Date: April 3, 2006
2. Review Engineer: Larry Bryant
3. Date Received: March 31, 2006
4. Facility Name: City of Newton (Iowa Speedway)
5. County Number: 50 (Jasper)
6. Program Area: CP (Wastewater Construction)
7. Facility Type: C01 (Collection/Transport)
8. Subject Area: 344 (Pump Clogging Protection)
9. Rule Reference: 567-64.2(9)a
10. Design Stds Ref: 13.4.2 (Protection Against Clogging)
11. Consulting Engr: Howard R. Green Company
12. Variance Rule: 567-64.2(9)c

13. Decision: *approved*Date: *4/4/06*

14. Appeal:

Date:

15. Description of Variance Request:

The City of Newton is requesting a variance from IA 13.4.2, which requires that all pumping stations that handle raw wastewater have provisions for screening (trash baskets for small stations, bar screens or mechanically cleaned screens with a manually cleaned bar screen bypass for larger stations). The application is a pumping station that will serve new racetrack (NASCAR-type) facilities located at the City of Newton as well as minor existing and initial anticipated development located in the adjacent area. The lift station firm capacity will be 400 gpm (2-pumps, each rated for 400 gpm @ 64' TDH, 20-hp) with flows equalized by a 160,000 gallon covered basin during racetrack events. The primary reasoning for omitting screening is that the pumping station will use submersible chopper pumps, which are less susceptible to clogging than other types.

16. Consulting Engineer's Justifications

- The project specifications require chopper pumps (chopper pumps in lieu of screening have been previously accepted by the IDNR)
- In addition to the two installed pumps, one complete pump will be furnished as a spare (one complete pump assembly without the motor is specified)
- The anticipated design life for this pumping station is unusually short. It is expected that this station will be in service for 5 years or less (until the City constructs a new 14 MGD South Central Lift Station to replace this and the existing South East Lift Station).
- Initial flows to the lift station will only be significant during race events. Prior to a race event, the City will inspect the station to make sure it is operational and ready for event flows (removing any accumulated debris in the wet well prior to the event).

17. Department's Justifications

Recommend variance approval:

Chopper pumps employ sharpened impeller blades and a cutter plate to chop solids and stringy materials so that they can easily pass through the pump. In principle, this is similar to grinder pumps that use a cutter extended from the impeller shaft to grind solids prior to pumping. However, chopper pumps use the impeller itself as a cutting tool rather than a separate cutting attachment.

The use of specialized pumps (chopper pumps) has been previously approved in an application without screening and this installation has not experienced any problems attributed to lack of screening (see below). The City's inclusion of a spare pump and description of planned maintenance also lend some justification to the argument for omitting

screening provisions. The short design life of the pumping station may also alleviate some concerns over decreasing effectiveness of the pump impeller cutting surfaces due to wear over time, but is not by itself adequate justification, as there are no assurances that the life of the lift station will be as short as expected. However, the combination of reasons presented is adequate to provide justification based on substantially equivalent effectiveness. In addition, the lift station controls will include a radio-telemetry-based system to monitor and control the lift station from the wastewater treatment plant SCADA system. Thus, if a pump should fail for any reason an alarm condition will be transmitted directly to the wastewater treatment plant.

Previous variance requests included in our files applicable to this situation appear to be limited. I located only four requests for elimination of the screening requirement. Of these, two were approved and two were denied. Only one of the previous requests includes the use of specialized pumps as the primary basis for justification and this variance was granted. Variances have been granted for elimination of the screening requirement for a chopper pump application in the City of Logan and for the retrofit of three existing lift stations in the City of Grand Junction where the existing lift stations had operated without screening for approximately 63 years without any noted problems. Since the variance granted for the City of Logan is similar to this application in the use of chopper pumps without screening, I contacted the City's operator, Scott Muxfeldt, to inquire as to the current status of the installation. The Logan lift station has been on-line since 2001 and Mr. Muxfeldt noted that the pumps were operating satisfactorily, with no clogging problems. He also noted that the pumps were pulled/inspected regularly as part of a yearly maintenance schedule.

18. Precedents Used

City of Logan - Approved 7/18/01
City of Boyden - Denied 3/6/90

City of Grand Junction - Approved 8/15/02
City of Halbur - Denied 3/8/99

19. Staff Reviewer:

Date: 4/3/06

20. Authorized by:

Date: 4/4/06

• discussion w/ WCF. Condition variance approval such that if clogging does occur, they will be required to install screening.



Howard R. Green Company

March 30, 2006

Larry Bryant
Iowa Department Of Natural Resources
Wallace State Office Building
502 E. 9th St.
Des Moines, IA 50319

Re: City of Newton, IA – South Central Lift Station

Dear Mr. Bryant:

This letter is in response to your review comments for the above referenced project. With this letter we are requesting a variance from IDNR Design Standards Chapter 13.4.2 requiring all pumping stations handling raw wastewater to have provisions for screening to protect the pumps from clogging or damage.

To support the argument to not provide screening or a trash basket we have some significant items we would like the IDNR to consider. These items are as follows:

- The project specifications require the use of submersible chopper pumps. One duty pump and one redundant pump will be supplied. In addition, one complete pump will be furnished as a spare part and can be replaced quickly in the event that the duty pump fails. The chopper pump is specifically designed to handle trash, rags and debris without fail. The IDNR has accepted chopper pumps in lieu of screening for new lift stations (see attached correspondence).
- The South Central Lift Station has an unusually short design life. The station and equalization basin was designed to exclusively handle flows from the Iowa Speedway. The lift station capacity was later slightly increased to handle some additional flows from potential development near the Iowa Speedway. The plan is that the station will be in service **less than five years** until the existing South East (SE) Lift Station is abandoned and a new 14 mgd South Central Lift Station will be constructed to handle the wastewater flows from the Iowa Speedway, surrounding development and flows currently being handled by the SE Lift Station. Additionally, the push for development in the area has been greater than anticipated and the likelihood is that the new larger station will need to be on-line sooner than originally planned. The City is planning for a Facility Plan in the near term to fully evaluate wastewater infrastructure needs in the area.
- Flows from the Iowa Speedway will only be significant during a scheduled race event. These race events will only be scheduled for up to six races per year. The remainder of the time, the South Central Lift station will only pump the smaller flows from the early development. Prior to an event, the City will inspect the station to make sure it is operational and ready for event flows. During these regular inspections, the City will remove any debris accumulating in the wetwell.

Please review this request for variance and, if accepted, please issue a Construction Permit for the project. If you have questions or comments about the design or this request, please don't hesitate to contact me. By the way, we truly appreciate the timeliness of the IDNR's review for this project.

Sincerely,

HOWARD R. GREEN COMPANY

A handwritten signature in black ink, appearing to read "James Rasmussen", written in a cursive style.

James Rasmussen, P.E.
Project Manager/Vice-President

Cc Bob Main – WWTP Superintendent
David Stewart – City Engineer

Enclosure



STATE OF IOWA

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

DEPARTMENT OF NATURAL RESOURCES
JEFFREY R. VONK, DIRECTOR

July 18, 2001

Honorable Mayor
City of Logan
202 E. 7th Street
Logan, Iowa 51546

Subject: City of Logan Wastewater Treatment Facility- Lift Station.

Dear Mayor:

The Iowa Department of Natural Resources (IDNR) has received and reviewed the variance request for the lift station for the City of Logan submitted by the city's consulting engineer. The request is to construct a new lift station without trash baskets. IDNR Design Standards Chapter 13.4.2 requires all pumping stations handling raw wastewater to have protection against clogging.

Based on the information submitted to support your request we concur that the proposed chopper pumps will provide substantially equivalent and effectiveness to trash baskets. Your request for a variance from IDNR Design Standards Chapter 13.4.2 has been approved.

If you have any questions or comments contact Suresh Kumar of the IDNR at (515) 281-4527 or e-mail him at suresh.kumar@dnr.state.ia.us.

Sincerely,

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

Jack Riessen, Chief
Water Quality Bureau

cc: Veenstra & Kim Inc.
Iowa DNR Field Office 4



STATE OF IOWA

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

DEPARTMENT OF NATURAL RESOURCES
JEFFREY R. VONK, DIRECTOR

April 5, 2006

David Stewart, Public Works Director
City of Newton
1700 N. 4th Avenue W.
Newton, IA 50208

RE: Variance Request from IA 13.4.2
City of Newton - South Central Lift Station

Dear Mr. Stewart:

The Iowa Department of Natural Resources in accordance with Subrule 567-64.2(9)c of the Iowa Administrative Code has reviewed your March 30, 2006 request for a variance from Section 13.4.2 of the Iowa Wastewater Facilities Design Standards. This section requires that all pumping stations handling raw wastewater have provisions for screening to protect the pumps from clogging or damage. A variance to use specialized chopper pumps in lieu of screening for this installation is approved with the following condition:

- If clogging problems are experienced in the future, the City shall make necessary modifications to provide screening protection for the lift station in accordance with Section 13.4.2 of the Iowa Wastewater Facilities Design Standards.

This decision is based upon 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 standard on this issue.

If you have any questions or comments please contact me at 515-281-6759.

Sincerely,

A handwritten signature in black ink, appearing to read "Larry Bryant".

Larry Bryant
Wastewater Section

cc: Howard R. Green/Des Moines
IDNR Field Office 5