# VARIANCE REQUEST

**Iowa Department of Natural Resources**

| | | | | | |
|---|---|---|---|---|---|
| 1. | Date: | February 1, 2006 | 13. | **Decision:** | approval |
| 2. | Review Engineer: | Satya Chennupati | | Date: | 2/3/06 |
| 3. | Date Received: | June 30, 2005 | | | |
| 4. | County Number: | 91 | 14. | **Appeal:** | |
| 5. | Facility Name: | East Peru | | Date: | |
| 6. | Program Area: | CP (Wastewater) | | | |
| 7. | Facility Type: | CO5 | | | |
| 8. | Subject Area: | 343, pond influent piping | | | |
| 9. | Rule Reference: | 507-64.2(9)a | | | |
| 10. | Design Stds Ref: | 18C.7.4.4 | | | |
| 11. | Consulting Engr: | Bartlett & West | | | |
| 12. | Variance Rule: | 507-64.2(9)c | | | |

15. Description of Variance Request:

The City requested a variance from the design standard which requires installation of pond influent lines for controlled discharge lagoons to be located below the average elevation of the seal. The city is proposing to install the DIP influent lines above the pond seal. This variance relates to another variance request for this project requesting not to provide an inlet depression for both lagoon cells.

16. Consulting Engineer's Justifications

Estimated Cost Savings: $380. Equivalent effectiveness. Reasonable monthly sewer rates.

East Peru is a participant in the Iowa Rural Water Association Small Community Wastewater Pilot Project.

17. Department's Justifications

Recommend variance ***approval***.

The idea of allowing to install the pond influent piping above the pond seal and furthermore, eliminate the saucer shaped inlet depression is one of the variances approved by the DNR for the Rural Water Association Small Community Wastewater Pilot Project. However, DIP piping can be used without the variance because Design Standards allow use of DIP piping. No problems have been reported for previously approved projects.

The variance is approved with the following **conditions**:

1. The influent discharge lines shall rest on a suitable concrete apron which is large enough such that the terminal influent velocity at the end of the apron does not cause soil erosion as required by the Iowa Wastewater Facilities Design Standards 18C.7.4.6. The apron must have a lip or baffle at the opposite end of the discharge point.

2. Adequate measures must be taken to ensure that the line is properly/securely anchored.

18. Precedents Used

Persia, Tingley, Avery, Pulaski

| | | | | |
|---|---|---|---|---|
| 19. | Staff Reviewer: | Satya Chennupati | Date: | 2/1/06 |
| 20. | Supervisor: | | Date: | |
| 21. | Authorized by: | | Date: | 2/3/06 |

Fields of Opportunities

STATE OF IOWA

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

DEPARTMENT OF NATURAL RESOURCES
JEFFREY R. VONK, DIRECTOR

February 1, 2006

Ms. Peggy Crabbs
Warren Water District
1204 East 2nd Avenue
Indianola, IA 50125

Subj: Department Response to Variance Requests
RE: Wastewater System Improvements, City of East Peru, Iowa

Dear Ms. Crabbs:

The Department has received a request for several variances from the Iowa Wastewater Facilities Design Standards from your Engineer in a letter dated October 24, 2005. This letter transmits the Department's comments regarding the variance request for the above referenced project. The responses are grouped in the same order as they were requested.

A. Design Standard 18C.5.1 – request variance to allow a two-cell controlled discharge lagoon with approximately 1.98 acres of total surface area.

   The above variance is **approved** in accordance with the Small Community Pilot Project concept as providing equivalent effectiveness.

B. Design Standard 18C.7.4.4 – request variance to allow installation of influent DIP lines at or above the elevation of the pond seal.

   The above variance is **approved** based on the small community pilot project concept as providing equivalent effectiveness with the following **conditions**:

   a. Adequate measures must be taken to ensure that the line is properly/securely anchored.
   b. The influent discharge lines shall rest on a suitable concrete apron which is large enough such that the terminal influent velocity at the end of the apron does not cause soil erosion as required by the Iowa Wastewater Facilities Design Standards 18C.7.4.6. The apron must have a lip or baffle at the opposite end of the discharge point.

C. Design Standard 18C.5.6.2 – request variance to allow construction of inter-cell buried valves in lieu of constructing inter-cell structures.

   The above variance is **approved** based on the small community pilot project concept as providing equivalent effectiveness with the following **conditions**:

   a. The buried piping is ductile iron (DI).
   b. The requirement for two drawoff levels in accordance with Iowa Wastewater Facilities Design Standards 18C.7.6.4.a shall be met. The drawoff piping and valves shall be arranged so that plugging or failure of any individual inter-cell control valve will not prohibit transfer of wastewater from the primary cell to the secondary cell via the second drawoff level.

c. Frequent exercise of valves shall be part of the routine maintenance program.

D. Design Standard 18C.7.4.6 – request variance to eliminate saucer –shaped depressions at the discharge point of the influent piping.

The above variance is **approved** based on the small community pilot project concept as providing equivalent effectiveness with the following **conditions**:

a. The influent discharge lines shall rest on a suitable concrete apron which is large enough such that the terminal influent velocity at the end of the apron does not cause soil erosion as required by the Iowa Wastewater Facilities Design Standards 18C.7.4.6. The apron must have a lip or baffle at the opposite end of the discharge point.

E. Design Standard 18C.10.6 – request variance to allow pond level measurements to be accomplished in riser piping in lieu of pond level gauges.

The above variance is **approved** based on the small community pilot project concept as providing equivalent effectiveness with the following **conditions**:

a. The riser piping shall be arranged so that independent level measurement from all lagoon cells can be obtained.
b. Another acceptable means of cell depth measurement will be installed if freezing proves to be a problem.

F. Design Standard 11.3.2.2 – request to submit plans without vertical profiles. The low pressure collection system will be installed at a minimum depth of 5 feet. A topographic map will be used to determine air release valve locations.

The above variance is **denied** because there is neither a basis for the request nor any justification that would warrant a variance. This variance would constitute towards an incomplete submittal to the DNR for review.

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

Sincerely,

Wayne Farrand, P.E.
Wastewater Construction Section Supervisor

Cc: Brian Hollein, P.E. – Bartlett & West Engineers
IDNR Field Office #5 – Janet Gastineau
IDNR Sewage File 6-61-22-0-01

Enclosures

BARTLETT & WEST
ENGINEERS
SERVICE. THE BARTLETT & WEST WAY.

October 24, 2005

Satya Chennupati, P.E.
Wastewater Section
Iowa Department of Natural Resources
Wallace Building
502 East 9th Street
Des Moines, IA 50319

Re: East Peru, IA Wastewater Improvements
Facility Plan Preliminary Review Response

Dear Satya:

This letter is a follow up to your email and discussion concerning the preliminary review of the Facility Plan and also the variance request for the East Peru Wastewater Improvements project. You are requesting comments on the following:

1. Will the existing septic tanks be abandoned and disposed?
2. For the low pressure system, double check valves will be required for redundancy and backup.
3. A geotechnical report needs to be submitted.
4. Is the entire community being served by the collection system? Will basement service be provided? Provide documentation and numbers to justify.
5. Address the lagoon influent flow monitoring provisions.
6. Address the variance requests

Below is our response to your inquiries:

1. Existing septic tanks will be plugged and abandoned as a part of the project costs. However, if project bids are higher than expected, this is typically the first area to cut project costs. If that happens, it would be the homeowner's responsibility to abandon the existing septic tanks.
2. The low pressure collection system will be designed using double check valves between each grinder pump and the main collection line.
3. We understand a geotechnical report is needed. However, cooperative land acquisition negotiations have failed and the City is proceeding with the condemnation process. An injunction has been filed by the City attorney to gain access to the property to complete the geotechnical, environmental, and surveying work. It will be submitted as soon as it becomes available.
4. All but approximately 4 homes will be served by the collection system because of funding issues due to the large distance from the main portion of the City. The City limits for East Peru are very large compared to other small communities. These 4 homes are essentially rural customers and have the space to construct individual on-site systems if they do not currently have one. The potential exists to serve 2 of these 4 homes if the homeowner is willing to fund the additional pipeline needed to serve the area. All other users, including homes with basements, will be served by the low pressure system.

6913 VISTA DRIVE ■ WEST DES MOINES IA 50266-9309
515.440.2856 ■ FAX 515.440.2858 ■ 888.200.6464
WWW.BARTWEST.COM

5. Influent flow to the lagoon will be monitored using a flow measurement device such as a Palmer-Bowlus flume or something similar. This will be finalized during final design.
6. I understand you have discussed the variance requests via telephone with Brad Pleima. We have updated our variance requests based on your comments from the phone conversation.

We are requesting the following variances:

A. Design Standard 18C.5.1 – request variance to allow a two-cell controlled discharge lagoon with approximately 1.98 acres of total surface area. Estimated Cost Savings = $29,460
B. Design Standard 18C.7.4.4 – request variance to allow installation of influent DIP lines at or above the elevation of the pond seal. Estimated Cost Savings = $380
C. Design Standard 18C.5.6.2 – request variance to allow replacement of inter-cell buried valves in lieu of constructing new inter-cell structure. Estimated Cost Savings = $2,000
D. Design Standard 18C.7.4.6 – request variance to eliminate saucer-shaped depressions at the discharge point of the influent piping. Estimated Cost Savings = $1,000
E. Design Standard 18C.10.6 – request variance to allow pond level measurement to be accomplished in riser piping in lieu of Pond Level Gauges. Estimated Cost Savings = $500
F. Design Standard 11.3.2.2 – request to submit plans without vertical profiles. The low pressure collection system will be installed at a minimum depth of 5 feet. A topographic map will be used to determine air release valve locations. Estimated Cost Savings = $6,000

The attached spreadsheet is a cost savings estimate for each requested variance. The estimated cumulative project savings (including a 5% contingency on savings) of the requested variances is $41,010. Assuming this will be deducted from the 40-year, 4.5% USDA RD loan, this will reduce the monthly usage bill, on average, by approximately $3.58.

Many of the requested variances have been investigated for the small unsewered community pilot program and the Iowa DNR has agreed with many of the requested variances in a March 8, 1995 letter from Darrell McAllister to Iowa Rural Water Association.

It is our opinion that the requested variances will provide equivalent effectiveness in the treatment of the City's wastewater. In addition, it is our opinion that the requested variances will provide equivalent effectiveness in complying with the anticipated effluent limitations.

With a small community of only 51 anticipated users, each cost reduction is significant. These variance requests are important in maintaining reasonable monthly sewer rates for the residents of East Peru.

If you have any questions, please contact us.

Sincerely,

Brian L. Hoellein

Brian L. Hoellein, P. E.

cc: Peggy Crabbs – Warren Water District
Sheryl Henley – East Peru City Clerk
Randy Campbell – Rural Development
Jim Carroll – Rural Development
Jeremy Rounds – Southern Iowa Council of Governments
Hank Manning – Iowa Department of Economic Development

Enclosure

# Engineer's Opinion of Probable Cost
## TABLE 1 - COST SAVINGS
## East Peru Wastewater System Variance Requests
## Warren Water District
B&W Project No. 12136.001

**Schedule B - 3.3 MG Controlled Discharge Lagoon**

| Item | Description | Quantity | Unit | Unit Cost | Total Cost |
|---|---|---|---|---|---|
| A1 | Eliminate Additional Excavation for 3rd Cell | 4000 | CY | $2.50 | $10,000.00 |
| A2 | Eliminate Additional Rip-Rap for 3rd Cell | 320 | TN | $18.00 | $5,760.00 |
| A3 | Eliminate Inter-Cell Valves for 3rd Cell | 4 | EA | $800.00 | $3,200.00 |
| A4 | Eliminate Additional 6" DIP for 3rd Cell | 240 | LF | $20.00 | $4,800.00 |
| A5 | Eliminate Pond Level Measurement Gauge | 1 | LS | $500.00 | $500.00 |
| A6 | Reduce Land Purchase Cost for 3rd Cell | 1 | LS | $3,000.00 | $3,000.00 |
| A7 | Eliminate Fencing with 3rd Cell | 300 | EA | $5.00 | $1,500.00 |
| A8 | Eliminate Draw-off from 3rd Cell | 1 | LS | $700.00 | $700.00 |
| B | DIP Above Lagoon Liner | 190 | LF | $2.00 | $380.00 |
| C | Eliminate Inter-Cell Manhole | 1 | EA | $2,000.00 | $2,000.00 |
| D | Eliminate Depressions | 400 | CY | $2.50 | $1,000.00 |
| E | Change Pond Level Measurement Gauge | 2 | LS | $250.00 | $500.00 |
| | | | | | $33,340.00 |
| | | | | +5% Contingencies: | $1,670.00 |
| | | | | Subtotal: | **$35,010.00** |
| F | Eliminate Topographic Survey of Collection System | 1 | LS | $6,000.00 | $6,000.00 |
| | | | | Total Cost Savings | **$41,010.00** |

**Debt Service Reduction(annual)** **$2,190**

**Average Debt Service Reduction(monthly per customer)(51)** **$3.58**