

VARIANCE REQUEST

Iowa Department of Natural Resources

1. Date : 4-27-98
 2. Review Engineer : Terry Kirschman
 3. Date Received : 4-21-98
 4. Facility Name : Marcus
 5. County Number : 18
 6. Program Area : CP
 7. Facility Type : COS
 8. Subject Area : Subsurface Drainage System - 322
 9. Rule Reference : 567-64.2(9) "a"
 10. Design Std. Ref. : 18C.3.5.3
 11. Consulting Engr. : Johnson Erickson & O'Brien
 12. Variance Rule : 567-64.2(9) "c"
 13. Decision: *Approved*
 Date: *4/29/98*
 14. Appeal:
 Date:

15. Description of Variance Request

Interior subsurface drainage system
 located in a berm for cells 3 & 4.
 This drainage is pumped back to the
 ponds. (See 4-27-98 Letter)

16. Consulting Engineer's Justification

Siting did not accommodate sufficient
 separation from ponds 1 & 2 to
 avoid the need for added protection
 of cells 3 & 4.

16. Consulting Engineer's Justification (cont.)

17. Department's Justification

direct
No discharge to the receiving stream
from this arrangement can occur.

interior
All subsurface flows will be
pumped back to the plant.

There is the potential for groundwater
other than seepage, but this should be
minimized as there is a perimeter
subsurface drainfield up gradient to
intercept this flow.

Recommend approval.

18. Precedents Used

None

19. Staff Reviewer

20. Supervisor

21. Authorized by

Tom Kischer
[Signature]
[Signature]

Date: 4-27-98

Date: 4/28/98

Date: 4/29/98



TERRY E. BRANSTAD, GOVERNOR

DEPARTMENT OF NATURAL RESOURCES

LARRY J. WILSON, DIRECTOR

April 27, 1998

The Honorable Loren Stowater
Mayor of Marcus
222 N. Main
Marcus, Iowa 51035

SUBJECT: Wastewater Treatment Plant - Variances
Marcus, Iowa
CS 192104 01

*for variance
file*

Dear Mayor Stowater:

The Iowa Department of Natural Resources has reviewed the April 21, 1998, submittal from Johnson, Erickson, and O'Brien. Three variance requests have been made in letters dated April 1 and 21, 1998, to accommodate the design included in the final plans and specifications.

1. Iowa Design Standard 18C.7.4.4 states that the influent lines for controlled discharge ponds shall be located along the bottom of the pond so that the top of the pipe is just below the average elevation of the seal. The variance request by Marcus to partially bury the influent lines to each primary cell as proposed in the plans and specifications is approved. However, a complete and effective seal will be provided below the pipe. Also, this ductile iron line shall be designed to prevent flotation.
2. Iowa Design Standard 18C.7.5 states that control structures shall contain the controls to allow variable water level and flow rate control. The variance request to bury the gate valve controls outside the control structures is approved provided ductile iron pipe is used for this construction as specified.
3. Iowa Design Standard 18C.3.5.3 states that detailed justification shall be provided to confirm that the groundwater layers are of a limited area and to confirm the adequacy of the proposed drainage system around the pond system. The subsurface drainage configuration proposed for Marcus includes two separate systems, one outside the berms and the other on the interior between the primary and secondary cells. The interior drainage configuration is intended to retain the integrity of the lower elevation secondary pond cells (3&4) should there be migration of pondwater from the upper elevation primary pond cells (1 & 2) resulting from the severe change in operating levels (at times possibly 18.8 feet) and limited space for construction.

The variance request by Marcus to include an interior subsurface drainage system between the upper and lower elevation lagoon cells is approved. However, groundwater intercepted by the interior subsurface drainage system shall be pumped back to the lagoon ponds throughout the life of the project. The pumping station for the interior subsurface drainage shall be designed to eliminate all potential for an accidental release of the subsurface drainage contents to the receiving stream during an equipment failure. Only the subsurface drainage system located outside the perimeter of the berms may be discharged directly to the receiving stream as proposed. The City of Marcus shall monitor the impact and report the quantities of interior subsurface drainage. If the interior subsurface drainage is too high for the ponds to contain, extensive modifications to the controlled discharge treatment facility may be required.

Should you have any questions, please call Terry Kirschenman at 515-281-8885. Also, submit four complete sets of the plans and specifications for our approval.

Sincerely,

A handwritten signature in dark ink, appearing to read "Darrell McAllister", written in a cursive style.

Darrell McAllister
Bureau Chief
Water Quality Bureau

cc: Johnson Erickson O'Brien & Associates, Norfolk, NE
Field Office 3

1998 APR -6 P 12:4

DEPT OF
NATURAL RESOURCES



JOHNSON
ERICKSON
O'BRIEN

April 1, 1998

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

Reference: Marcus, Iowa
Wastewater Treatment Facility
SRF Project No. CS192104 01
J-E-O # 1729 S 1

Dear Mr. Kirschenman:

Following our review of your additional comments on our design, and subsequent discussions with you, the following responses are intended to take care of the remaining concerns to result in approval in the very near future.

Revised design schedules G, H1, H2 and K1 are enclosed to be substituted for those previously submitted.

With my new understanding of what is requested by the design flows on Schedule G, they have been revised to better reflect the actual conditions. With these figures, the 180 day retention criteria can be met. In fact, in reviewing past flow records, and assuming a likely discharge cycle of Spring to Fall, the 180 day flows preceding the probable discharge time have been somewhat less than the design flow of 0.235 MGD, with the obvious exception of the '92-93 years.

The intent of the perforated pipe and interceptor trench within the perimeter of the lagoons is not only to lower an area of perched water but to protect against progression of moisture through the dike from the high lagoon, possibly resulting in a "blow-out" on the exposed lower side of the dike. The soils consultant expressed serious concern about deleting them. With the risk of dike failure, we feel that the piping system must be left in place. The amount of discharge from this system is not anticipated to be significant, and it is not anticipated to carry any significant level of contaminants so we will plan to install a small pumping station in the final line so that the flow can be pumped back into the lagoon. We hope to demonstrate after the system is operating that the above facts are true and the direct discharge is not detrimental to the receiving stream.

ENGINEERING
ARCHITECTURE
SURVEYING
PLANNING

April 1, 1998
Terry Kirschenman, P.E.
Department of Natural Resources
Page 2

We request that a variance be granted for the perforated lines within the site, on the basis of the previous discussions.

The driveway relocation is more of a property acquisition situation than a lagoon design issue so it will be separated in the bidding document to obtain a distinct bid price as shown on the enclosed revised page of the proposal form to be included in the revised set.

Our interpretation of the influent line standard was previously incorrect and the line is now shown on the revised plan sheet, to be as low as it is physically possible to get. The top is still slightly above the lagoon floor but that is as low as it can be and still discharge at grade in the center depression. We have provided that the compacted liner shall extend below the pipe to the specified minimum thickness.

We ask for a variance for the use of the gate valve controls for the transfer and discharge pipes. The lines are of ductile material and should function well with the gate valves so that no excavation for servicing should be necessary as you indicated was a concern initially. I believe you said yesterday that the in-line valves were not now a significant concern.

We have added a fourth discharge pipe to the final discharge lines so that three locations within the lagoon depth can be drawn from.

All of the inlet ends of the discharge pipes will include a 90° elbow to effect a scum baffle.

Enclosed are the revised and additional specification pages as well as revised plan sheets. Can these simply be substituted for those previously submitted? If you prefer, we can provide complete new sets of each. At least these enclosures will allow you to complete your review and in the meantime the new sets can be provided.

Sincerely,

JOHNSON-ERICKSON-O'BRIEN
and ASSOCIATES, INC.



Ronald E. Benson, P.E.

Enclosures in quadruplicate: Plan sheets and Specification pages

Copy w/ single copy of enclosures: City of Marcus



J O H N S O N
E R I C K S O N
O ' B R I E N

April 21, 1998

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

Reference: Marcus, Iowa
Wastewater Treatment Facility
SRF Project No. CS192104 01
J-E-O # I729 S 1

Dear Mr. Kirschenman:

Enclosed are four (4) copies of revised plan sheets 9, 10, & 12 of 16, which address the first two comment items of your April 14th letter. Specifically, on sheet 12, we have revised detail 2/12 and the hydraulic profile to provide for more levels of drawoff. There will now be three levels of drawdown from cells 1 & 2 to the inter-cell diversion structure. They will be at the 2' and 4' levels as well as the surface overflow. This is also detailed on the piping detail on Sheet 10.

Sheet 9 is also revised to relocate the perimeter perforated pipe to the outer dike toe in all locations. The one interior line is now proposed to flow to the lift station relocated at the north end of the dike between cells 1 and 4. This station will now collect any flow in this pipe and pump it back to Cell 1. By a valve change, it can be diverted to Cell 4. An overflow line is also provided to discharge to cell 4 in the event that the pumps should fail and the station fills to the overflow. This overflow will occur prior to the station overflowing the top.

In regard to the fifth comment, we will contact Mr. Furrey or Mr. Khosravi to modify the NPDES permit to account for the reduction of the design influent flow

Sincerely,

JOHNSON-ERICKSON-O'BRIEN
and ASSOCIATES, INC.

Ronald E. Benson, P.E.

Enclosure: Plan sheets as referenced

Copy w/encl.: City of Marcus

E N G I N E E R I N G
A R C H I T E C T U R E
S U R V E Y I N G
P L A N N I N G