



File Name

Senders Initials

Hartford - d
JH

18C.7.2

department of water, air and waste management

COP

April 12, 1984

Mr. Terry J. Lutz, P.E.
McClure Engineering Company
705 First Avenue North
Fort Dodge, IA 50501

RE: Hartford Preliminary Engineering Report
Variance Request

Dear Mr. Lutz:

This is in response to your request received March 13, 1984 on behalf of the City of Hartford, for a variance from the following departmental design standards.

1. 18C.4.1 - 100 gallons per capita per day (gpcd) minimum design flow. The requested design flow is 85 gpcd. 353
2. 18C.7.2.7 - Erosion Protection. The request is to not install erosion protection at the time of construction. 306
3. 18C.5.3.2 - Storage of 30 days shall be provided in each secondary cell. The request is for the design of secondary cells with a total of 44 days storage rather than 60 days. 380

Since the proposal would not provide equivalent or greater effectiveness, it has been determined to deny the variance request. The site does not appear to be conducive to the construction of a controlled discharge lagoon. Even with the reduced size of the lagoon because of the proposed reduced flow and no allowance for future growth, the lagoon will not fit on the site without yet another variance to reduce the size of the secondary cells.

On the issue of no riprap, this would be a large lagoon for proposing no erosion protection on the inside berms.

In looking at alternatives, we agree that an aerated lagoon may cost more when looking at life cycle cost. However, the cost of cleaning an aerated lagoon

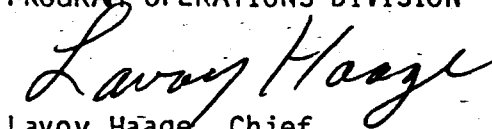
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Mr. Terry J. Lutz, P.E.
McClure Engineering Company
Page 2
April 12, 1984

and chlorination are included. We don't feel that sludge removal is a legitimate cost. Also, the department is reviewing its position on disinfection and disinfection may not be required. If you would like me to check on that further, please let me know.

Sincerely,

PROGRAM OPERATIONS DIVISION



Lavoy Haage, Chief
Wastewater Permits Branch

LH:mla/WPW103F04.02

cc: Region 5
Patricia Buzzard, City Clerk, Hartford, Iowa

COPY

STATE OF IOWA
DEPARTMENT OF WATER, AIR AND WASTE MANAGEMENT
HENRY A. WALLACE BUILDING
DES MOINES, IOWA 50319

PRELIMINARY ENGINEERING REPORT ACCEPTANCE

Senders Initials

RECORD COPY

Hartford, sewage
Billich

City of Hartford
City Hall
Hartford, Iowa 50118

WAWM Project No.: S84-278
File: Hartford, Sewage
Re: Wastewater Treatment Facility

We have completed our review of the preliminary engineering report for the above referenced project. We are in general agreement with the concepts, conclusions, and recommendations contained in this report.

However, we would like to offer the following comments:

The proposed three cell aerated lagoon is much larger than our design criteria recommended. If costs become a problem, we would suggest the City to reduce the size of the lagoon as the first step to reduce costs.

In accordance with the rules of this Department, plans and specifications for the proposed facility must be submitted to this Department for review and issuance of a construction permit prior to construction of such facilities. The plans and specifications should be in concurrence with the preliminary engineering report as accepted. Any deviation from the facility design as outlined in the engineering report must be identified and accompanied by an explanation detailing the reasons for modifications.

Contact Billy Chen at 515/281-8980 with any questions or comments.

By:

Larry Hoag
PROGRAM OPERATIONS DIVISION

Date:

October 24, 1984

cc: McClure Engineering Co. Fort Dodge
Region 5

BC:m1a/WWPW300F10.01

Site Survey Distribution

(1) Engineer



department of water, air and waste management

RECORD COPY
File Name Hartford - ww
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COPY

August 24, 1984

City Clerk
City Hall
Hartford, IA 50118

ATTENTION: Honorable Mayor

RE: Waste Treatment Facility Site
Hartford, Iowa

Dear Mayor Allen:

We have completed a cursory review of the plans for the proposed waste treatment facility. Our review focused mainly on the site requirements. The final site shown on the plans is located on both site A and part of site B of the original proposed sites. It appears that this new location will reduce the separation distance between the lagoon and several additional houses to less than the required 1,000 feet.

The more detailed engineering information presented in the plans and specifications makes it clear that additional considerations are necessary. The original site report indicated only one house is located less than 1,000 feet away from the proposed lagoon. It now appears from the plans that four houses are located within the 1,000 feet distance. A city well was observed to be located less than 500 feet from the boundary of site B. Since the final site is located on part of site B, the separation distance may be less than the required distance. The distance depends on if it is a deep well or a shallow well. A shallow well also requires a separation of 1,000 feet. A deep well requires 400 feet. The final site is also located within a floodwater basin of Red Rock Lake and requires Army Corps of Engineer's approval.

We suggest that your design engineer recheck the separation distance between the proposed lagoon and housing to be sure it meets our 1,000 feet requirement and to determine the type of well. We also suggest that written agreements with all residence owners located within 1,000 feet of lagoon be obtained as soon as

LH:r1s/WPW237K14.01

City Clerk
City Hall
August 24, 1984
Page 2

possible in order to expedite the review process. By regulations, this Department can not issue a construction permit for any waste treatment facility until the site is approved.

If you have any questions, please do not hesitate to contact this office directly.

Sincerely,

PROGRAM OPERATION DIVISION


Lavoy Haage, Chief
Wastewater Permits Branch

LH:rls/WWPW237K14.01

cc: { Terry Lutz
 { McClure Engineering
 Region 5



department of water, air and waste management

RECORD COPY

File Name

Senders Initials

August 24, 1984

Mrs. Judy Johnston
730 West Elm
Hartford, IA 50118

RE: Waste stabilization lagoon - separation distance

Dear Mr. & Mrs. Johnston:

This is in response to our telephone conversation on August 20, 1984, regarding our rules on separation distances of residences from wastewater treatment facilities. As you can see from the enclosed copy of a portion of Chapter 900-64.2(3) (455B) of the Iowa Administrative Code, a separation distance of 1000 feet is required unless there is a written agreement with the owner. If there is an agreement, the separation distance does not apply.

We further discussed lagoons and odor problems. I will reiterate, municipal lagoons that are properly designed and not overloaded will not cause severe odor problems. There may be some odor from a lagoon in the spring when the ice leaves. But, depending on weather conditions, it probably would not last more than one week or possibly two.

You also asked about the quality of the water discharged from a lagoon. It will not be of drinking water quality but it will be of a quality that will not impair downstream water uses as required by our rules.

The person who gave you information that the odors would be so bad you would need an air conditioner and that the effluent would be bad may have been talking about a lagoon for a hog confinement operation or possibly a severely overloaded lagoon handling domestic waste. In either situation, odors can be bad for a prolonged period and any discharge would be equally bad.

I mentioned to you that Carlisle and Bondurant are two cities nearby that have lagoon systems. Bondurant is expanding their system and converting it to an aerated lagoon. Pleasantville also has a 3-cell controlled discharge waste stabilization lagoon. I would suggest you contact the City Clerk in either or all of those cities and try to make arrangements to look at their lagoons and to talk to some of the people in the area.

If you have any questions, please free free to contact me at 281-8975.

Sincerely,

PROGRAM OPERATIONS DIVISION

Lavoy Haage, Chief
Wastewater Permits Branch

LH/dlw/WWPW237W01.01



department of water, air and waste management

May 8, 1984

Duplicate
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File # _____ *SWB*
Sender's Initials _____ *pet*

The Honorable Albert Allen
Mayor
City of Hartford
Hartford, Iowa 50118

Dear Mayor Allen:

I appreciated the opportunity to meet with you and the other members of the Hartford delegation on Tuesday. I hope that you are satisfied that your concerns were heard and that you understand my need to maintain the critical balance between the protection of the state's water resources and costs of building new wastewater treatment facilities.

Your proposal represents a complex set of issues. While there is obvious concern for costs, by our view, the hilly site selected requires substantially higher costs for earth moving than might typically be encountered. The location is also upwind of the city to the prevailing winds. While this location is not recommended by this Department, it would also not be precluded under our rules. The cells in the proposed lagoon system are also not at the same elevation, a feature which puts further constraints on the operation of a lagoon system and limits the flexibility to isolate and deal with problems in individual cells. Regardless of what might be done to meet design volume requirements, the design will not meet our sizing requirements for individual cells. For these reasons, we do not believe that the proposed design provides as much assurance of compliance with effluent requirements as the alternative aerated lagoon system which we are confident would constitute a long term solution to the city's needs.

While we are convinced that aeration would be the best approach for all concerned, I cannot ignore the economic constraints that you presented to me at our meeting. For this reason, I have carefully reviewed the details of your proposal and our design criteria; to identify areas of compromise that we could possibly accept. While I understand your estimates of probable wastewater flow, our own analysis of recently built collection systems does not justify altering our position on 100 gallons per capita per day. Flows from such plants are commonly as great as 100 gallons per capita per day and often are actually as much as two times that figure.

The option that does appear feasible is to allow the city to design the cells with greater depths consistent with the suggestion of Dr. Dague. Of all the options, this alternative appears to present the least potential problems. Ordinarily, I would not consider this option on a new system, but the unique constraints on your chosen site cause it to be the most workable option. Although these modifications to lagoon depths would not likely result in

The Honorable Albert Allen
May 8, 1984
Page 2

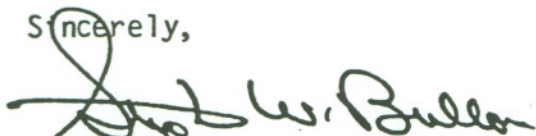
compliance with the detention time requirements for individual cells, we accept this as another necessary variance coincident to our agreement to this alternative.

Your request that this Department issue a variance to install riprap is not granted. Erosion of the walls of the lagoons is likely without riprap. We have recently experienced cases of lagoon failure where it was not in place. Under these circumstances, construction without riprap is not warranted. In addition, I am sure you would find that later installation of riprap would be far more costly to the city.

Finally, our department's foremost concern is that new facilities continuously comply with their final effluent limits. We must continue to aggressively enforce these requirements, since failure to meet them has a direct impact on the downstream water uses that we are charged to protect. Consequently, while this Department would accept a final proposal by the city that incorporates deeper cells to extend the detention time, the permit to do so would be conditioned on the city's acceptance of responsibility for further improvements should the facility not meet its effluent limits. In order to foster understanding and agreement between us on the form of any further upgrading, I would ask that the final plans for your proposed facility include the details of what would be constructed in the future, given violations of effluent limits.

While a lagoon constructed in this manner may not entirely satisfy all of our requirements, I do feel that this approach reflects the best compromise.

Sincerely,



Stephen W. Ballou
Executive Director

SWB:ka

cc: The Honorable William Dieleman, State Senator
The Honorable Ed Parker, State Representative
Brent Wynja, Congressman Tom Harkin's Office

The University of Iowa

Iowa City, Iowa 52242

Division of Energy Engineering
Environmental Engineering Program
2203 Engineering Bldg.

(319) 353-4205

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File Name City of Hartford

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April 26, 1984

Congressman Tom Harkin
1401 North Jefferson Street
Suite I
Indianola, IA 50125

Dear Congressman Harkin:

The purpose of this letter is to comment on the design criteria for waste stabilization lagoons, specifically the problem being experienced by the City of Hartford in meeting the State of Iowa criteria for such facilities.

From my discussions with Brent Wynja of your office and Terry Lutz of the McClure Engineering Company, it is my understanding that the main problem is a shortage of land area at the preferred site. This results in the engineers not being able to provide the required 180 day storage time for a wastewater flow rate of 100 gallons per capita per day (gpcd). They are able to provide 180 days of storage for only about 85 gpcd.

In general, I feel that the Iowa design standards for waste stabilization lagoons are quite good. About ten years ago, I presented a paper on lagoons at several conferences around the midwest. In that paper (copy attached) I proposed design standards for lagoons that are virtually identical to those adopted by the Iowa Department of Environmental Quality. The criteria recommended at that time are shown in Figure 11 on page 17 of the paper.

The performance of waste stabilization lagoons is affected significantly by ambient weather conditions, as discussed in detail in the paper. The concept of intermittent discharge, requiring long-term storage, arose from the fact that the performance of lagoons varies so much on a seasonal basis. The 180-day storage criterion enables retention and intermittent discharge of wastewaters, enabling the release of lagoon contents during times when the quality of the liquid meets discharge permit requirements.

It is my opinion that the 180-day storage requirement is more important to overall lagoon performance than are the depth criteria. The Iowa criteria, and my original recommendations, were that the primary and secondary cells be not more than 6 feet and 8 feet in depth, respectively. However, I see no serious problem with making the primary cells six inches deeper (total of 6.5 ft). The fact that the proposed BOD loadings on the primary cells of the Hartford lagoon system are lower than what is allowed by the Iowa criteria (18 lb BOD₅ per acre per day actual vs 25 allowed) is another reason for my feeling that the added depth will be of little consequence in terms of any adverse effects on performance. I would also see little problem with some deepening of the secondary cells, if this is necessary to achieve the 180 day minimum storage requirement.

Based on the information I have on the Hartford situation and my technical background and experience with waste stabilization lagoons, I believe that the best approach is simply to deepen the primary cells, and the secondary cells if necessary, to achieve the 180 day storage requirement at a wastewater flow rate of 100 gpcd. This should add very little to the cost of the facility. On the other hand, the minor deepening will enable achievement of the storage criterion with minimal, if any, adverse effect on the performance of the lagoon treatment system.

I hope these comments are of some value in your efforts to help the City of Hartford resolve the current problem. If I can be of further assistance, please let me know.

Sincerely yours,

A handwritten signature in dark ink, appearing to read "Richard R. Dague". The signature is fluid and cursive, with the first name "Richard" being more prominent than the last name "Dague".

Richard R. Dague, Ph.D., P.E.
Professor, Civil and
Environmental Engineering

Enclosure



McCLURE ENGINEERING COMPANY

CONSULTING ENGINEERS

705 FIRST AVENUE NORTH

FORT DODGE, IOWA
50501

PHONE 576-7155
AREA 515

March 12, 1984

Mr. Billy Chen
Iowa Dept. of Water,
Air and Waste Management
Henry A. Wallace Bldg.
900 East Grand
Des Moines, IA 50319-0032

Re: Hartford Sewerage Improvements

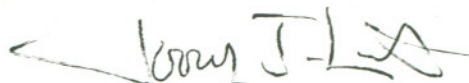
Dear Billy:

As we discussed, we are requesting one additional variance from WAWM Design Standards. Along with the two requested in the Addendum to the Preliminary Report, the third variance request relates to Chapter 18 C.5.3.2. As shown in our Addendum, the hydraulic detention time in the secondary cells is proposed to be 44 days rather than the standard 60. This is because we have expanded the primary cells to match the existing site. 180 days of detention time will still be provided.

Please include this letter in the Addendum. If you have any questions, please let me know.

Very truly yours,

McCLURE ENGINEERING COMPANY


Terry J. Lutz, P.E.

TJL:lg

MAR 13 1984
RECEIVED
DIRECTOR OF
DEPARTMENT



department of water, air and waste management

February 7, 1984

Mr. Michael F. Trotter
McClure Engineering Company
705 First Avenue North
Fort Dodge, IA 50501

RE: Wastewater Treatment Facility Variance Request
Hartford, Iowa

Dear Mr. Trotter:

This is to reply to your letter of January 17, 1984 in which you requested the following variances from this Department for the City of Hartford's proposed controlled discharge lagoon.

1. Variance allowing the construction of a portion of the primary cell with a 10 ft. water depth.
2. Variance allowing the construction of both secondary cells with a water depth of 10 ft.
3. Variance allowing construction without rip-rap on the interior of the cell dikes.

In that letter, you also listed the following reasons to justify your variances request.

1. A controlled discharge lagoon offers the advantages of simplicity of operation and they are very reliable, consistently producing acceptable quality effluent. Therefore, I believe this is the best alternative for Hartford.
2. The City of Hartford would prefer to construct a controlled discharge lagoon, for the reasons mentioned above, provided it is the least costly alternative.

The department's rules, Chapter 900-64.2(9)c allows for a variation from design standards when it will result in at least equivalent effectiveness while significantly reducing cost or improved effectiveness. We have reviewed your request and have decided to deny the variance for the following reasons.

1. Departmental design standards limit cell depths to 6 feet on primary cells and 8 feet on secondary cells. The 10 feet depths would not be as effective and would be a much greater potential for odor problems.

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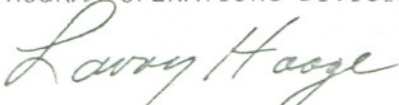
Mr. Michael F. Trotter
McClure Engineering Company
Page 2
February 7, 1984

2. The cost of an alternative is not that much higher and there is not a significant reduction in cost.

If you have any questions concerning this decision, please do not hesitate to contact this office directly.

Sincerely,

PROGRAM OPERATIONS DIVISION



Lavoy Haage, Chief
Wastewater Permits Branch

LH:mla/WWPW037F08.02

cc: City Clerk, Hartford, Iowa
Region 5



McCLURE ENGINEERING COMPANY

CONSULTING ENGINEERS

705 FIRST AVENUE NORTH

FORT DODGE, IOWA
50501

PHONE 576-7155
AREA 515

January 17, 1984

RECEIVED

JAN 18 3 08 PM '84

Mr. Billy Chen
Iowa Dept. WAWM
Henry A. Wallace Bldg.
900 East Grand
Des Moines, IA 50319

DEPARTMENT OF
WATER AND
WASTE MANAGEMENT

Re: Hartford, Iowa
Wastewater Treatment Facility

Dear Mr. Chen:

I am writing concerning the type of treatment facility that should be constructed at Hartford. As you are aware, we are looking at two alternatives, (1) a controlled discharge lagoon and, (2) an aerated lagoon.

I have previously sent you cost estimates, proposed lagoon layouts and Cross-sections for the controlled discharge lagoon alternate. As you are aware, construction of this alternate would require WAWM variances for the items listed below.

1. Variance allowing the construction of a portion of the primary cell with a 10 ft. water depth.
2. Variance allowing the construction of both secondary cells with a water depth of 10 ft.
3. Variance allowing construction without rip-rap on the interior of the cell dikes.

I am requesting the variances for the following reasons:

1. A controlled discharge lagoon offers the advantages of simplicity of operation and they are very reliable, consistently producing acceptable quality effluent. Therefore, I believe this is the best alternative for Hartford.

Page 2
January 17, 1984

2. The City of Hartford would prefer to construct a controlled discharge lagoon, for the reasons mentioned above, provided it is the least costly alternative.

I have previously submitted cost estimates for an aerated lagoon and the controlled discharge lagoon and it appears that the controlled discharge lagoon is slightly less costly (present worth including O&M) provided we are allowed to proceed with this alternative. Due to the small cost difference in the estimates of these two alternatives, we would like to take bids on both a controlled discharge lagoon and an aerated lagoon. Therefore, we are requesting that WAWM consider the controlled discharge lagoon and the variances.

We would like to take bids on this project as soon as possible, therefore, I would appreciate a ruling at the earliest possible date.

If you have any questions, please feel free to write or call.

Very truly yours,

McCLURE ENGINEERING COMPANY



Michael F. Trotter, P.E.

MFT:lg

cc: City of Hartford