

# Staff Report

Story County

Planning and Zoning Commission

**Date of Meeting:**  
October 7, 2020

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**Case Number CUP07-20**

Cambridge Waste Water Outfall Pipe

**APPLICANT:** Steve Van Dyke/City of Cambridge  
225 S Water Street  
Cambridge, IA 50046

**STAFF PROJECT MANAGER:** Marcus Amman, Planner

**SUMMARY:** The City of Cambridge is proposing the construction of a new waste water outfall pipe from their existing lagoon system. The current outfall pipe does not meet the distance requirements for ammonia and E. Coli mixing measurements. The proposed outfall pipe would allow for the city to meet IDNR ammonia and E. Coli mixing requirements at a distance of 2,000 feet from the closest creek. The proposed pipe will be directionally bored to the new outlet location on the south side of the Heart of Iowa bridge that goes over the South Skunk River on property owned by Story County Conservation. Planning and Development Staff are recommending that the Story County Planning and Zoning Commission approves the Conditional Use Permit with a condition.

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## Property Information

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### PROPERTY OWNERS

Story Country  
Story County Conservation Board  
56269 180<sup>th</sup> ST  
Ames, IA 50010

### GENERAL PROPERTY LOCATION

Section: 22 Township: 82 Range: 23 SW SW

### SITE ADDRESS

East of Center Street  
Cambridge, IA 50046

### PARCEL IDENTIFICATION NUMBER(S)

14-22-300-600 28.79-Gross Acres

### CURRENT ZONING

A-1, Agricultural District

### CURRENT LAND USE

The current land use at the proposed site is agricultural conservation and is part of the Heart of Iowa Trail. The property is mainly surrounded by agricultural uses to the south and east. Directly west of this parcel, is another parcel owned by Story County and is also part of the Heart of Iowa Trail. The parcel to the north contains the Cambridge Waste Water treatment plant that the outfall pipe will transport treated water from to the South Skunk River.

### FUTURE LAND USE MAP DESIGNATION

Agricultural Conservation

### CITIES WITHIN TWO MILES

Cambridge

### Floodplain

Yes, applicant will need a county Floodplain Permit to construct the proposed outfall pipe in the flood plain.

**The following items were submitted by the applicant:** CUP Application, Site Plan, narrative describing need of the outfall pipe, proposed specifications, and responses to County Staff review comments.

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## Background

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This Conditional Use Permit addresses a proposed new 18" outfall pipe for the City of Cambridge wastewater lagoon system. The City of Cambridge, Iowa operates a continuous discharge aerated lagoon wastewater treatment facility. This system treats sewage from Cambridge, primarily



originating from domestic sources. In addition, the system also treats “Inflow and Infiltration (I&I)”, which is essentially non-sewage water that leaks into the sanitary collection system from leaky pipes, surface drain connections, sump pump connections and other sources. The aerated lagoon type of treatment employed at Cambridge has no issues handling the additional flow from these I&I sources, so this is not considered to a significant problem.

With the aerated lagoon type of treatment system, wastewater is treated over a long period of time in very large earthen lagoons. Aeration is provided by mechanical blowers and a network of diffusers on the bottom of the lagoons. The aeration helps to mix the contents of the lagoons and provides oxygen to the micro-organisms that break down the waste thereby cleaning the water. After treatment, the cleaned effluent is discharged to the South Skunk River via an existing outfall pipe.

The treatment system is located on the east side of town near the South Skunk River. The original wastewater system, including collection system and controlled discharge lagoons, were constructed in the early 1970’s. One of the two original lagoons was converted to a three cell aerated lagoon in 2002. Since that time, the treatment system has performed very well; reliably and consistently meeting the effluent limitations established in the discharge permit issued by Iowa Department of Natural Resources (IDNR), according to the City’s engineering consultant Fox Engineering.

The plant was not designed to meet any specific effluent ammonia limitations. The purpose of this project is to make improvements to the wastewater treatment facilities to enhance their reliability, increase capacity, to adequately treat for Ammonia and E. Coli in order to safely and reliably operate the City of Cambridge’s wastewater system for the next 20 years. Four different options were considered for this project, with the outfall pipe being the most cost effective option for the City of Cambridge. An easement of approximately 6,500 sqft for this project has been granted from Story County Conservation and was recorded on 06/29/2020. The total estimated area that will be disturbed for construction of the outfall sewer is 0.58 acres, which is approximately 2% of the 28.79 parcel area. . The proposal is set to impact 2% of the natural area of the parcel, below the 15% threshold that would require any mitigation per the Story County Land Development Regulation.

Positive environmental effects will be improved treatment of the wastewater from the City of Cambridge, compliance with effluent discharge permit limits, reduced discharge of the pollutants ammonia and E. coli to the receiving stream, and improved water quality in the receiving stream.

The City of Cambridge did not receive a letter that initiated the need for this project. Their existing NPDES stated that there were new requirements that were not in place previously. IDNR issues wastewater dischargers like Cambridge updated NPDES permits approximately every five years. When Cambridge’s permit was renewed in 2014, it included new ammonia limits and disinfection limits that their earlier permits did not have. This new permit initiated the need for this project.

Moving forward, the procedure and schedule for compliance with the IDNR requirements will be:

1. Complete construction of the project.
2. Complete an "in field" stream mixing zone study to document how well the effluent mixes with the river.
3. IDNR reviews and approves the mixing study report.
4. IDNR completes a new Waste Load Allocation (WLA) based on the mixing zone study results. The WLA will identify the ammonia limits needed to protect aquatic life in the river.



5. IDNR issues a new NPDES discharge permit to Cambridge with the new ammonia limits (which are set by the WLA).
6. For the life of the facility, the City is required to test the effluent weekly and report the results to IDNR monthly in order to document compliance with the NPDES permit requirements.

## Bulk Standards

The outfall pipe will be directionally bored southeast of the waste water lagoon system. The proposed outfall pipe is unlikely be seen by anyone not on the South Skunk River. The purpose of this outfall pipe is to allow for the Cambridge waste water treatment facility to meet the DNR requirements for ammonia and E. Coli. The existing outfall pipe does not allow for the proper distance for the treated water to mix with the river due to the location of the existing perennial creek. The distance from the injection of the treated water to where the measurements are taken is 2,000 feet, unless another body of water joins the river. There is a perennial stream within 500 feet of the existing outfall pipe. This does not allow for enough mixing distance to meet the DNR ammonia and E. Coli requirements.

The property is located just southeast of the City of Cambridge limits, adjacent to the parcels that contain the waste water lagoon system. The property on which the proposed outfall pipe is to be constructed is 28.79 gross acres and owned by the Story County Conservation Board. The parcel to the south is in agricultural production and is 21.23 acres. The floodplain encompasses the proposed parcel, the parcel to the south, and the waste water lagoon system.

The proposed outfall pipe is slated to have the design completed in October of 2020. The project would go for public bidding in December of 2020. Construction would be slated to occur between March and December of 2021. The actual construction of the project is slated for four weeks. This timeline allows for the contractor's schedule as well as weather conditions to be taken into account.

## Compatibility

The new 18" outfall pipe will be compatible with the development and use of adjacent properties. Because it is in the floodplain, future development of any adjacent areas is extremely unlikely. Wastewater treatment effluent is normally discharged into nearby streams or rivers as proposed with this project, so this is considered to be a normal feature along waterways. Access to the area is very limited to the public, so the improvements are expected to be relatively unnoticed when complete. The new outfall sewer will be buried. For the most part, it will not be noticeable after construction is complete. The only evidence of its existence from ground surface will be the three buried manholes and the outlet headwall structure. The manholes will be four feet inside diameter and constructed of precast concrete per SUDAS standards. Each manhole will have a 26-inch diameter cast iron cover, which is typical for municipal sewer construction. Each cover will be bolted down to prevent removal or blow off during a flood event, and each will be installed with the top flush with ground surface. The small outlet headwall structure will be constructed of cast in place concrete as shown in the drawings.

## Transition

The proposed outfall pipe is being directionally bored below ground. No transition is proposed or needed. No buffering is needed.



## Traffic

It is anticipated that Cambridge Staff will access the outfall site approximately one time per year on foot (no vehicles) to observe the headwall structure and check for damage or erosion concerns. Access would be via the existing permanent easement. No other access requirements are anticipated. The Heart of Iowa Trail will not be impacted by construction of the project.

## Parking

During the construction of the outfall pipe, parking will take place on the subject property using existing access points to the property. No parking or equipment storage will take place in the right of way. No new parking or loading is proposed for this project.

## Lighting

There are no signs or lighting is proposed.

## Environmental Protection

The project will provide improved conditions from an environmental protection standpoint for safe recreational use of the river, with improved treatment and disinfection of the wastewater. The completed project will have no negative impacts on noise, vibration, dust, smoke, fumes, odor, glare, groundwater pollution or other undesirable, hazardous or nuisance conditions, including weeds. The total estimated area that will be disturbed for construction of the outfall sewer is 0.58 acres, which is approximately 2% of the 28.79 parcel area. Because the total estimated disturbed area for construction of the project is less than one acre, an NPDES General Permit No. 2 for Storm Water Discharge Associated with Industrial Activity or Construction Activities is not required. The Story County erosion control requirements of 88.05 (4) will be followed.

## Proposed Outfall Pipe

Throughout construction and after, no significant environmental impacts are expected. This proposed outfall pipe is not anticipated to impact the supply or quality of light or air to the surrounding properties as it will be below grade. The outfall pipe is also not anticipated to impact any property values in the area and will not be seen except for where the pipe meets the river. The proposed site is located in a floodplain.

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## Analysis

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### A. **Applicable Regulations:** Chapter 90.04: Standards for Approval

The Planning and Zoning Commission shall review the proposed development for conformance to the following development criteria:

1. **Compatibility.** The proposed buildings or use shall be constructed, arranged and operated so as to be compatible with the character of the zoning district and immediate vicinity, and



not to interfere with the development and use of adjacent property in accordance with the applicable district regulations. The proposed development shall not be unsightly, obnoxious, nor offensive in appearance to abutting or nearby properties.

Applicant Comment: The new 18" outfall pipe will be compatible with the development and use of adjacent properties. Because it is in the floodplain, future development of any adjacent areas is extremely unlikely. Wastewater treatment effluent is normally discharged into nearby streams or rivers as proposed with this project, so this is considered to be a normal feature along waterways. Access to the area is very limited to the public, so the improvements are expected to be relatively unnoticed when complete. The new outfall sewer will be buried. For the most part, it will not be noticeable after construction is complete. The only evidence of its existence from ground surface will be the three buried manholes and the outlet headwall structure. The manholes will be four feet inside diameter and constructed of precast concrete per SUDAS standards. Each manhole will have a 26-inch diameter cast iron cover, which is typical for municipal sewer construction. Each cover will be bolted down to prevent removal or blow off during a flood event, and each will be installed with the top flush with ground surface. The small outlet headwall structure will be constructed of cast in place concrete as shown in the drawings.

Staff Comment: Wastewater treatment facilities are a conditional use in the A-1 District. The requirement for a conditional use permit is based on the provision of Chapter 90 Table 90-1 of the Story County Code of Ordinances. Wastewater treatment facilities do not have supplemental standards. The property on which the proposed structure is to be constructed is 28.79-gross acre parcel owned by the Story County Conservation Board with the existing Heart of Iowa Trail on it. The property is located just outside of the City of Cambridge limits, adjacent to the parcels that contain the waste water lagoon system. The parcel to the south is in agricultural production and is 21.23 acres. The floodplain encompasses the proposed parcel, the parcel to the south, and the waste water lagoon system. The proposed outfall pipe will not be seen unless on the river.

2. **Transition.** The development shall provide for a suitable transition, and if necessary, buffer between the proposed buildings or use and surrounding properties.

Applicant Comment: There are no proposed buildings or surrounding properties that will be impacted by the improvements.

Staff Comment: The proposed outfall pipe is being directionally bored below ground. No transition is proposed or needed. No buffering is needed.

3. **Traffic.** The development shall provide for adequate ingress and egress, with particular attention to vehicular and pedestrian safety and convenience, traffic flow and control, and emergency access.

Applicant Comment: It is anticipated that Cambridge Staff will access the outfall site approximately one time per year on foot (no vehicles) to observe the headwall structure and check for damage or erosion concerns. Access would be via the existing permanent easement. No other access requirements are anticipated. The Heart of Iowa Trail will not be impacted by construction of the project.



Staff Comment: The traffic impact of the proposed structure is expected to be minimal. There is no proposed increase of traffic as a part of this new outfall pipe. The Heart of Iowa Trail is not going to be impacted.

- 4. Parking and Loading.** The development shall provide all off-street parking and loading areas as required by this Ordinance, and adequate service entrances and areas. Appropriate screening shall be provided around parking and service areas to minimize visual impacts, glare from headlights, noise, fumes or other detrimental impacts.

Applicant Comment: There will be no parking or loading requirements associated with this project.

Staff Comment: During the construction of the outfall pipe, parking will take place on the subject property using existing access points to the property. No parking or equipment storage will take place in the right of way. No new parking or loading is proposed for this project.

- 5. Signs and Lighting.** Permitted signage shall be in accordance with the applicable district regulations and shall be compatible with the immediate vicinity. Exterior lighting, if provided, shall be with consideration given to glare, traffic safety and compatibility with property in the immediate vicinity.

Applicant Comment: There are no signs or lighting required or planned for this project.

Staff Comment: There are no signs or lighting is proposed.

- 6. Environmental Protection.** The development shall be planned and operated in such a manner that will safeguard environmental and visual resources. The development shall not generate excessive noise, vibration, dust, smoke, fumes, odor, glare, groundwater pollution or other undesirable, hazardous or nuisance conditions, including weeds.

Applicant Comment: The project will provide improved conditions from an environmental protection standpoint for safe recreational use of the river, with improved treatment and disinfection of the wastewater. The completed project will have no negative impacts on noise, vibration, dust, smoke, fumes, odor, glare, groundwater pollution or other undesirable, hazardous or nuisance conditions, including weeds. The total estimated area that will be disturbed for construction of the outfall sewer is 0.58 acres, which is approximately 2% of the 28.79 parcel area. Because the total estimated disturbed area for construction of the project is less than one acre, an NPDES General Permit No. 2 for Storm Water Discharge Associated with Industrial Activity or Construction Activities is not required. The Story County erosion control requirements of 88.05 (4) will be followed.

Positive environmental effects will be improved treatment of the wastewater from the City of Cambridge, compliance with effluent discharge permit limits, reduced discharge of the pollutants ammonia and E. coli to the receiving stream, and improved water quality in the receiving stream.



Staff Comment: No vibration, dust, smoke, fumes, odor, glare, groundwater pollution or other undesirable, hazardous or nuisance conditions, including weeds, are anticipated. The proposal is set to impact 2% of the natural area of the parcel, below the 15% threshold that would require any mitigation per the Story County Land Development Regulation.

**If the Board concludes that all the above development criteria will be met, it must recommend approval of the application unless it concludes that, if completed as proposed, there is a strong probability the development will:**

- 1. Not adequately safeguard the health, safety and general welfare of persons residing or working in adjoining or surrounding property.**

Staff Comment: The proposed outfall pipe will be over 150 feet from the north property line, with all other distances being greater. The proposed outfall pipe has a flap gate where the waste water will meet the river to protect from flood waters backing into the system or animals getting into the system. The outfall pipe will allow for the city to meet the IDNR ammonia and E. Coli requirements and continue to operate.

- 2. Impair an adequate supply (including quality) of light and air to surrounding properties.**

Staff Comment: The proposed outfall pipe will be below grade.

- 3. Unduly increase congestion in the roads, or the hazard from fire, flood, or similar dangers.**

Staff Comment: No traffic impacts are expected from this project. No increase to hazards are expected.

- 4. Diminish or impair established property values on adjoining or surrounding property.**

Staff Comment: The Story County Assessor's Office raised no concerns with this item from the review of the requested Conditional Use Permit application. No impacts on property values are anticipated.

- 5. Not be in accord with the intent, purpose and spirit of the Land Development Regulations or County Cornerstone to Capstone (C2C) Plan.**

Staff Comment: The C2C plan is oriented toward preserving the county's rural character and high value agricultural land, protecting environmentally-sensitive areas, and identifying areas for future growth and development. The proposed outfall pipe will help the city be able to meet the IDNR requirements and allow for more waste water to be treated.

**B. Burden of Persuasion.**



1. **The burden of persuasion as to whether the development, if completed as proposed, will comply with the requirements of this Chapter is at all times on the applicant.**
2. **The burden of presenting evidence to the Board of Adjustment sufficient enough for it to conclude that the application does not comply with the requirements of this Chapter is upon the person or persons recommending such a conclusion, unless the information presented by the applicant warrants such a conclusion.**

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## Commentary

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The following comments are part of the official record of the proposed **City of Cambridge Wastewater Outfall Pipe CUP07-20**. If necessary, conditions of approval may be formulated based off these comments.

Conceptual Review – September 17, 2020

**Comments from the Assessor’s Office**

No comment

**Comments from the Auditor’s Office**

No comment

**Comments from the Engineer’s Office**

No comment

**Comments from the Emergency Management’s Office**

No comment

**Comments from the Interagency Review Team and applicant responses:**

Planning and Development

1. For the Conditional Use Permit Application submittal, please provide written responses to each item in Ch. 90.04 Standards of Approval. *Provided*
2. Please confirm that on the proposed outfall pipe is planned to be located in unincorporated Story County. *Yes*
3. Please provide details about what will be treated, the treatment method and process, explain the quality of water discharged, impacts to South Skunk River, and IDNR requirements. *Provided*
4. Explain the high I/I flows identified in the narrative and will any of the proposed work effect this? *Project will not effect I/I*
5. Explain further about the A1, B(WW-2) stream designation and how the “mixing zone” area where the outfall pipe is planned will impact the stream.
  - i. *B(WW-2) - Waters in which flow or other physical characteristics are capable of supporting a resident aquatic community that includes a variety of native nongame fish and invertebrate species. The flow and other physical characteristics limit the maintenance of warm water game fish populations. These waters generally consist of small perennially flowing streams.*
  - ii. *A1 - Waters in which recreational or other uses may result in prolonged and direct contact with the water, involving considerable risk of ingesting water in quantities sufficient to pose a health hazard. Such activities would include, but*



*not be limited to, swimming, diving, water skiing, and water contact recreational canoeing.*

6. Has annexation of the proposed work area been discussed with the City of Cambridge and Story County Conservation? *No, Story County Conservation is not in support of annexing the parcel into the City of Cambridge.*
7. When would work commence? *March-December 2021*
8. How long will the project take? *4 weeks*
9. Will the Heart of Iowa Trail be impacted during construction? If so is there a proposed detour? *Not being impacted.*
10. A Floodplain Permit will be required for the proposed work. Conditions of the U.S. Army Corps of Engineers and Iowa Department of Natural Resources including providing a No Rise Certificate from an Iowa Licensed Engineer will be required. Understood Also please comply with Chapter 80 Story County Flood Plain Management Program. Specifically Ch 80.12 (3) A. No use shall cause any increase in the one percent annual chance or greater flood level... C. No use shall affect the capacity of conveyance of the channel or floodway of any tributary to the main stream, drainage ditch or any other drainage facility or system. D. Utilities if permitted, shall meet the applicable development standards of the Floodway Fringe District and shall be constructed or aligned to present the minimum possible resistance to flood flows. Ch 80.13 (3) F Waste Water treatment facilities shall be provided with a level of flood protection equal to or greater than three (3) feet above the one percent annual chance or greater flood elevation. The base flood elevation near the proposed outfall pipe is 851'. Will the manhole covers be flush with the grade and water tight seals to protect against inundation of flood water? Flap gate information provided.
11. What is the annual expected maintenance to the outflow pipe? *Once a year*
12. Will you obtain an NPDES permit for the construction or will the proposed project be covered under the existing NPDES permit? Please provide a copy of the permit. Otherwise, Story County has requirements for erosion control for areas less than one acre disturbed found in Chapter 88.05 (4). *New NPDES is not required, will follow county requirements.*
13. The proposed construction area is in the Natural Resource Area. If over 15% of the natural areas are disturbed, mitigation requirements in Chapter 88.05 apply. Please confirm construction of the outflow pipe route will be directional bored in lieu of open trench. *Directional bored, little impact expected to natural resource area*
14. What is the estimated amount of natural areas to be disturbed? *2%*
15. Is there any other improvements to the water treatment plat planned in the next five years? If so what are they? *No improvements are planned.*
16. The CUP application submittal will be reviewed by County staff, the Planning and the Zoning Commission will make a recommendation to the Board of Adjustment at public meetings. The deadline for a CUP submittal for the October 7, 2020 Planning and Zoning Meeting is September 21, 2020. The Board of Adjustment would act on the CUP at their October 21, 2020 meeting.



**Public notices were mailed to adjacent property owners within ¼ mile of the proposed site on September 30th, 2020.**

**Comments from the General Public:**

As of the writing of this staff report there were no comments from the public.

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## **Points to Consider for the Conditional Use Permit Request**

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1. Applicant addressed the need for the proposed outfall pipe. The purpose of the project is to make improvements to the wastewater treatment facilities to enhance their reliability, increase capacity, and to adequately treat for Ammonia and E. Coli in order to safely and reliably operate the City of Cambridge's wastewater system for the next 20 years.
2. The outfall pipe will allow the City of Cambridge to meet IDNR requirements.
3. The outfall pipe will be buried, the only portion that will be visible is where the pipe meets the river.
4. An easement has been granted for construction and maintenance of the outfall pipe by Story County Conservation to the City of Cambridge.
5. There is no traffic anticipated for this project.
6. No impacts to the Heart of Iowa Trail are anticipated.
7. No environmental impacts are expected.

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## **Conditions of Approval**

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### **Chapter 90.05: Recommendations on Applications**

**Staff Recommendation:**

**Story County Planning and Development Staff Recommends approval of the Conditional Use Permit for the City of Cambridge Wastewater Outfall Pipe CUP07-20 with the following condition:**

- **The applicant shall provide ammonia and E. coli mixing study results to the Planning and Development Department after construction and mixing study is completed.**

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## **Alternatives**

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The Story County Planning and Zoning Commission may consider the following alternatives:

- 1) The Story County-Planning and Zoning Commission approves the Conditional Use Permit for the City of Cambridge Wastewater Outfall Pipe CUP07-20, as submitted.
- 2) **The Story County Planning and Zoning Commission approves the Conditional Use Permit for the City of Cambridge Wastewater Outfall Pipe CUP07-20, with conditions.**
- 3) The Story County Planning and Zoning Commission denies the Conditional Use Permit for the City of Cambridge Wastewater Outfall Pipe CUP07-20.



- 4) The Story County Planning and Zoning Commission remands the Conditional Use Permit for the City of Cambridge Wastewater Outfall Pipe CUP07-20, back to the applicant for further review and/or modifications, and directs staff to place this item on a future Story County Planning and Zoning Commission agenda.