REQUEST FOR DECISION

Subject:	**Hamlet of Huxley Wastewater Study**
Meeting Date:	Tuesday, May 14, 2024
Prepared By:	John McKiernan
Presented By:	John McKiernan

RECOMMENDED MOTION:

1. That Council accepts the Hamlet of Huxley Wastewater Study as information.
2. That Council directs Administration to coordinate a community engagement session with Huxley residents to present the findings of the wastewater study.

STRATEGIC PLAN ALIGNMENT: (Check all that apply)

☒ High Quality Infrastructure	☐ Economic Resilience	☒ Quality of Life	☐ Effective Leadership	☒ Level of Service

RELEVANT LEGISLATION:

Provincial (cite)- Code of Practice for Wastewater Systems Using a Wastewater Lagoon, 2003

Standards and Guidelines:

Standards and Guidelines for Municipal Waterworks, Wastewater, and Storm Drainage, Alberta Environment and Parks, 2013.

Wastewater Systems Standards for Performance and Design, Alberta Environment and Parks, 2013

Wastewater Systems Guidelines for Design, Operating and Monitoring, Alberta Environment and Parks, 2013.

Council Bylaw/Policy (cite)-

Bylaw #1699, Water and Wastewater Services

BACKGROUND/PROPOSAL:

Kneehill County, in conjunction with MPE, completed an assessment of the current wastewater system within the Hamlet of Huxley. This assessment included an open house to engage with the residents to explain the purpose of the study as well as affording the residents of the Hamlet the opportunity to bring forth concerns or positives of the wastewater system. Through this meeting, the consensus of the group was that other than during periods of sustained rain, the wastewater system wasn't causing much of an issue and seemed to perform as intended. One topic brought forward was potential support for Kneehill County to organize the periodic pumping of the resident's septic tanks instead of it being done individually by each resident.

The final draft of the study was received March 2024 and consisted of the following core components:

- Collect data and review of existing record drawings, equipment specifications, equipment manuals, WWTP operational data, laboratory test results, etc.
- Evaluate sizing and capacity of the low-pressure wastewater collection system.

- Develop a model of the existing low pressure wastewater collection system to assess the overall capabilities of the system and restriction to any growth within the Hamlet.
- Develop upgrade options based on MPE's evaluation and modeling of the Hamlet's existing wastewater collection system.
- Identify alternative wastewater collection and treatment options in addition to reviewing upgrade options for the existing wastewater collection system.

Bentley SewerCAD modeling software was used and a total of 41 lot services were modeled using a standard setup for each lot as specifics for each connection are unknown. GIS data was provided for elevations and five different scenarios were modelled.

DISCUSSION/OPTIONS/BENEFITS/DISADVANTAGES/OTHER CONSIDERATIONS:

The completion of the wastewater assessment concluded some of the following points:

- A maximum of 10 pumps of 0.5 HP and 15 pumps at 0.375 HP can pump effluent into the forcemain at the same time for the system to operate without any issues.
  However, with the lower 0.375 horsepower pump possibly not being able to overcome the required head elevation, a concern that the effluent might not be able to be pumped into the forcemain, leading to an overflow in the septic tank.
- Recommend that there is a check valve or backflow preventor installed in every household to prevent sewage backflow from the low pressure forcemain.
- Addition of manholes in the system for flushing would be beneficial; manholes installed complete with the flushing connections added upstream of the system and located at the east end of the system would be sufficient.

From these conclusions the report offers some recommendations to help with the overall performance of the current low-pressure system:

- Standardized Pump Design: Currently the County does not have a specification for pump design or any records of the pumps in operation throughout the Hamlet. This recommendation consists of standardizing all residential sewage pumps in the Hamlet with the same model. The cost to supply 41 standardized pumps (pump specifications are found in appendix 3 of the study) is estimated at $351,600 with an additional 25% for installation.
- Third Party Inspection of Septic Tanks: County to obtain a third party to inspect the condition of each pump and septic tank. This could help identify any problems that need to be addressed. A typical septic tank inspection is approximately $500 each but could be varied depending on factors such as accessibility, plumbing of the pump/tank, etc. A more thorough inspection of the tanks including the emptying of the tank and entering the tank would increase that estimate to approximately $4300 each.
  A typical inspection would cover: location, integrity of tank and lid, approximate tank size, evidence of water infiltration, and if possible the integrity and pump size. These items of the inspection would be the ones that are relevant to the Hamlet's current system.
- Install Flushing Connections: in the assessment 5 locations were identified as sites for a flushing connection. Each flushing connection would be comprised of a manhole with a flush connection. The approximate cost of each flush connection is $14,000 ($70,000 total).
- Ensure Check Valves are in Use: it is recommended that all households have a check valve or backflow preventor installed and operational to prevent sewage from the low pressure forcemain.
- Flushing Regime: In conjunction with the installation of flushing points, Kneehill County to develop a flushing program to remove any potential blockages within the forcemain.
- Upgrade Forcemain sizing: Through the modelling of the current system, a couple areas of concern were identified as a section of the system that would become overwhelmed. The

upgrading of forcemain in this area to 75 mm would improve the flow and would ease of the current system capacity.

Through the SewerCAD modeling performed on the Hamlet system it was determined that the collection system has adequate capacity to carry current Average Dry Weather Flow and Peak Wet Weather Flow only when a maximum of 10 pumps are running at the same time. To meet the required peak flows without any limit on the number of active pumps, the forcemain either needs to be upgraded in size or a lift station could be installed. Each model had a certain number of connections turned on simultaneously (5, 10, 15, 20, 25 connections) and each model showed the same two areas of the system increase in velocity and pressure.
The two areas of concern with the size of the forcemain are:
Railway Avenue between Main and 1st Street N.
1st Street N between Railway Avenue and Queens Avenue

The installation of lift station at the west end of the Hamlet was explored and the following were the observations:

- May help to relieve with some of the built-up line pressure but may not solve the concerns the model showed.
- The 50 mm forcemain will continue to restrict the flows.
- Would be more cost effective to upsize the forcemain in the noted trouble areas.

Alternatively, abandoning the current low pressure wastewater system for a conventional gravity sewer collection system was explored. The gravity sewer collection system would consist of 200 mm diameter piping. The class 4 cost estimate to replace the current system with a gravity collection system is $3,790,000. It should be noted that this cost estimate is for the collection system replacement and further investigation and costs would be incurred to upgrade the current lagoon.

A recommendation from the study was to have the individual septic tanks inspected to identify any potential issues contributing to the overall performance of the current wastewater system. Likewise, there seemed to be an overall interest from the community in the County beginning a program to collectively empty the septic tanks instead of each household taking on that responsibility. With these two reasons in mind, administration is proposing to engage with a third party to conduct septic tank inspections within this fiscal year. Cost estimates of approximately $500 - $4,300 per septic tank to perform this service were obtained. The estimates greatly vary due to the detail of the inspection required. As current information on these individual septic tanks is limited, there could be unforeseen issues that present themselves at the time of inspection which may involve additional costs. (ie: the need to have the tank emptied, confined space requirements). Overall estimate for this service is a minimum of $20,500.

After the completion of the septic tank investigation and confirmation that no concerns are evident that could prevent the County from adding a service level of coordinating the emptying of residential tanks, administration will present to Council for your consideration a plan to conduct a new service level of emptying septic tanks within the Hamlet of Huxley. This could be done annually at an approximate cost of $200/per tank.

FINANCIAL & STAFFING IMPLICATIONS:

Some of the more in-depth upgrades to the system are expected to be included within future budgets.

If tank inspections were to be a direction from Council the funds would be recommended to come from the Contingency reserve and added to the Huxley Wastewater Study project.

RECOMMENDED ENGAGEMENT:			
Consultative Decision (Consulting the Public- Two Way Communication)			
Tools:	Open House	Other:	

ATTACHMENTS:

Hamlet of Huxley Wastewater Study

COUNCIL OPTIONS:

1) Accept the Huxley Wastewater Study as presented with the addition for administration to prepare a community engagement session.
2) Accept the Huxley Wastewater as information.

FOLLOW-UP ACTIONS:

Engage with Hamlet residents to present the findings of the study as well as confirm with the residents the desire for the County to take the lead on septic tank cleaning.

Update the Water and Wastewater Bylaw to include some aspects noted from the study.

APPROVAL(S):

Mike Haugen, Chief Administrative Officer Approved- ☒