



## Staff Report

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**Report To:** Dan Best, Chief Administrative Officer

**From:** **Don Giberson, Director of Operations and Infrastructure**

**Date:** November 19 2018

**Report:** ESD.18.36

**Subject:** Mollard Line Culvert Structure #1056 – Replacement Alternatives

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### **Recommendations:**

**That** South Huron Council receive the report from Don Giberson, Environmental Services Director Re: Mollard Line Culvert Structure #1056 – Replacement Alternatives.

### **Purpose:**

The purpose of this report is to provide Council with information regarding alternatives for the replacement of Mollard Line Culvert Structure #1056.

### **Background and Analysis:**

As a follow up to the request from Council to explore alternatives, GMBluePlan engineers were engaged to investigate options for the replacement of the Mollard Line culvert. GM BluePlan investigated several different material options to the currently specified cast-in-place reinforced concrete structure, including round polyethylene pipe (High Density Polyethylene (HDPE) or Steel Reinforced Polyethylene (SRPE), Corrugated Steel Pipe Arch (CSPA) to match existing and pre-cast concrete box culvert. Each option was reviewed for feasibility of installation, supply and installation cost, delivery and installation time, as well as life cycle cost.

Round polyethylene pipe option was reviewed and eliminated as neither cost effective or as a practical alternative. HDPE pipe is limited in size and

required depth of cover, resulting in the need for multiple pipes to match the existing required flow.

Steel Reinforced Polyethylene (SRPE) option was reviewed and eliminated as neither cost effective or as a practical alternative. This is a more expensive pipe material than HDPE and typically more expensive than cast-in-place reinforced concrete structure.

Corrugated Steel Pipe Arch (CSPA) option with galvanized coating to match existing was reviewed. The pipe material is less expensive than cast-in-place reinforced concrete structure. However due to the minimal cover over the existing culvert, the CSPA option also includes a concrete load distribution slab installed over the culvert, as recommended by the CSPA manufacturer. The CSPA option is approximately 10% less expensive than the cast-in-place reinforced concrete option; but has a 25% shorter service life (40-75 years vs. 75-100 years for reinforced concrete). It was also noted that the existing CSPA culvert failed after 45 years of service.

Corrugated Steel Pipe Arch (CSPA) option with a higher grade polymer coating was also reviewed. This is a more expensive pipe material than CSPA with galvanized costing. Typically this is more expensive than cast-in-place reinforced concrete structure but does have a similar service life (40-100 years) as the cast-in-place reinforced concrete option.

Pre-cast concrete box culvert option was also reviewed. This is typically more expensive than cast-in-place reinforced concrete structure but does have the same service life as the cast-in-place reinforced concrete option.

All options reviewed had similar overall construction schedules (10-12 weeks). All options that utilized pipe materials had longer material delivery time and a shorter installation time. Cast-in-place reinforced concrete had a shorter material delivery time and a longer installation time. All options are constrained by the Regulatory requirements of restricted in-stream work during the fish spawning season (March 15 to July 15).

### **Operational Considerations:**

None were considered.

### **South Huron's Strategic Plan:**

Section 6.2.2 of the Municipality of South Huron 2015- 2019 Strategic Plan identifies key objectives that are reflective of the collective perspectives of the strategic planning process.

The recommendations and actions outlined in this report are reflective of the following strategic objectives:

Administrative Efficiency and Fiscal Responsibility

Increased Communications and Municipal Leadership

Transparent, Accountable and Collaborative Governance

**Financial Impact:**

There are no financial implications for the Corporation resulting from the proposed recommendation.

**Legal Impact:**

There are no legal implications for the Corporation resulting from the proposed recommendation.

**Staffing Impact:**

There are no staffing implications for the Corporation resulting from the proposed recommendation.

**Policies/Legislation:**

1. Minimum Maintenance Standards, under the Highway Traffic Act.
2. South Huron Asset Management Plan
3. DRAFT 2019 Transportation Services Capital Budget

**Consultation:**

GM BluePlan Engineers, CAO

**Related Documents:**

None

Respectfully submitted,



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**Don Giberson, Director of Operations and Infrastructure**