MEMORANDUM

TO: Airport Board
FROM: Patrick Dame, C.M., Executive Director
DATE: April 14, 2020
RE: Lagoon Environmental Assessment Preferred Alternative

We are at a point with the Lagoon Environmental Assessment that we need to make a decision on the preferred alternative. We initially anticipated the environmental impacts would help us determine the best options, however, all three alternatives have negligible impacts. Therefore, the selection comes down to what is the preferred action of the Airport.

Rod Senn from KLJ Engineering provided an overview of the alternative and impacts for your consideration.

Alternative 1: Build a replacement aerated lagoon with a cover system and ammonia treatment.

Alternative 2A: Construct a private connection to the Rapid City Water Reclamation Facility with a pipe across existing city property (shortest route, however, does not provide the maximum flexibility for future airport development due to the lift station location).

Alternative 2B: Construct a private connection to the Rapid City Water Reclamation Facility with a lift station at Highway 44 and Airport Road along with a pipe installed along Highway 44 (this is the longest route, however, it places the lift station at the lowest elevation and allows the most flexibility for future airport development).

STAFF RECOMMENDATION: Staff recommends Board Approval of Alternative 2B.
Rapid City Regional Airport

Selection of the Airport’s Preferred Alternative to replace the Airport’s Wastewater Lagoon
Background

• Existing System
  • Circular 1.1 acres stabilization lagoon
  • Built in the late 60’s
  • Designed as a total retention facility
• Department of Environment and Natural Resources is requiring the system to be replaced by 2023
• Began looking at replacement options in the 2015 Airport Master Plan
Current Conditions

Growth of the Airport

• Larger Terminal Building, expansion of general aviation facilities
• 350,972 enplanements in 2019
• Pumping in Summer of 2019 to prevent discharge
  • Peak summer usage and wetter than normal weather
• Existing lagoon is too small and does not meet current standards
Alternatives

• Two construction alternatives are being reviewed in the Environmental Assessment along with a required No Action.
  • Aerated Lagoon with a Cover System and Ammonia Treatment
  • Connection to the Rapid City Water Reclamation Facility
Aerated Lagoon with a Cover System and Ammonia Treatment

- Multi-celled aerated lagoon
- Ammonia Treatment
- HDPE lined and covered
- Lower upfront costs
- Higher O&M costs
- Requires a licensed operator
- Discharging System

Operational Considerations
- $1.0 million estimated construction costs
- $42,000 annual operations and maintenance costs
- Requires State Industrial Discharge Permit
- Requires a licensed operator
Connect to the Rapid City Water Reclamation Facility

- Option 1
  - Lift station with a force main across city owned property.
  - Connect to Rapid City collection system along Dunn Road.
- Operational Considerations
  - $1.6 million estimated construction costs
  - $8,500 annual operations and maintenance costs
  - No permit required
  - No licensed operator required
- Comparisons
  - Higher upfront cost
  - Lower O&M Cost
  - No discharge of effluent
  - No Operator needed
• Option 2
  • Lift station with a force main along Highway 44.
• Connect to Rapid City collection system along Dunn Road.
• Operational Considerations
  • $1.8 million estimated construction costs
  • $9,500 annual operations and maintenance costs
  • No permit required
  • No licensed operator required

• Comparisons
  • Highest upfront costs
  • Additional pumping requirements
    • Additional 35 feet of elevation change resulting in larger pump
  • Slightly higher O&M Cost than other force main alternative
  • No discharge of effluent
  • No Operator needed
  • Potential compatibility with future infrastructure

Connect to the Rapid City Water Reclamation Facility
<table>
<thead>
<tr>
<th>Alternative</th>
<th>Annual O&amp;M Cost</th>
<th>Annual Cost of Licensed Operator and/or Permit</th>
<th>Total Initial Cost</th>
<th>Present Worth of Annual O&amp;M (1)</th>
<th>Present Worth of Operator Cost and/or Permit (2)</th>
<th>Present Worth of Total Cost (2)</th>
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<td>Alternative A</td>
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(1) Present Worth Costs are based on an annually compounded interest rate of 5.00 percent over a 20-year period.
(2) The total present worth cost is equal to the initial costs plus the present worth of all annual costs.
(3) In 2019, the Airport spent nearly $100,000 on temporary modifications, pumping, and hauling effluent to remain in compliance with DENR.
(4) Present Worth of Alternative A is not considered as the Airport would be required to have a new system in place by January 1, 2023 per DENR requirements.
(5) The annual cost of a licensed operator was estimated to be approximately ½ the annual average salary for licensed water treatment plant operators in South Dakota according to careerexplorer.com.
Life Cycle Cost of Alternatives

**Year**

**Life Cycle Cost**
- Alternative B
- Alternative C-1
- Alternative C-2

**Total Life-Cycle Cost (Present Worth)**

<table>
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<th>Alternative C-1</th>
<th>Alternative C-2</th>
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The environmental impacts related to the construction of each alternative are very similar.

All build alternatives have temporary impacts to wetlands.
- Alt B = 0.065 acres
- Alt C-1 = 0.259 acres
- Alt C-2 = 0.828 acres

No mitigation is anticipated to be required for temporary impacts.

All three build alternatives meet the project purpose and need.

Alternative B requires a Permit from DENR, C-1 and C-2 would fall under the existing permit of the Water Reclamation Facility.

Alternative B also requires a licensed operator for the treatment system.
Questions