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AGENDA  
**JOINT LAGOON COMMITTEE**  
REGULAR MEETING - Community Hall Sandy Beach Highway 642  
63 Lakeshore Drive  
Sept 23<sup>rd</sup>, 2021 @ 6.30 PM.

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- |  |             |
|--|-------------|
| <b>1.0 CALL TO ORDER</b>   | Action      |
| <b>2.0 ACCEPTANCE OF AGENDA</b>  | Action      |
| <b>3.0 APPROVAL OF MINUTES</b>   |             |
| A. July 31 <sup>st</sup> , 2021;   | Action      |
| <b>4.0 DELEGATIONS</b>   | Info        |
| none   |             |
| <b>5.0 APPOINTMENT</b>   |             |
| No scheduled appointment(s);   |             |
| <b>6.0 BUSINESS ARISING</b>  |             |
| A. Lagoon Repair 2022;   | Action      |
| B.   | Action      |
| C.   | Action      |
| D.   | Action      |
| E.   | Info/Action |
| F.   | Info/Action |
| <b>7.0 DEVELOPMENT MATTERS</b> None  |             |
| <b>8.0 NEW BUSINESS</b>  |             |
| A. ATB Statement July 31 <sup>st</sup> , 2021 ( <b><u>NO ACTION</u></b> required); | Info        |
| B.   | Action      |
| C.   | Info/Action |
| <b>9.0 LAGOON MANAGER REPORT</b>   |             |
| A.   | Info/Action |
| <b>10.0 CORRESPONDENCE ITEMS</b>   |             |
| A. None  | Info        |
| <b>NEXT MEETING</b>  |             |
| To be determined   | Info        |
| <b>ADJOURNMENT</b>   | Action      |

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MINUTES  
**JOINT LAGOON COMMITTEE**  
REGULAR MEETING OF THE JOINT LAGOON COMMITTEE  
Sandy Beach Community Hall, Highway 642, 63 Lakeshore Drive  
July 31<sup>st</sup>, 2021 @ 12 PM.

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**IN ATTENDANCE**

Committee

Michael Harney (Chair & Deputy Mayor Sandy Beach)  
Gordon Drybrough (Mayor Sandy Beach)  
Denise Lambert (Councillor Sandy Beach)  
Glen Usselman (Mayor Sunrise Beach) (*regrets*)  
Jackie Tremblay (Deputy Mayor Sunrise Beach)  
Vera Beck (Councillor Sunrise Beach) (*regrets*)  
Emily House (Public Member)

Lagoon Manager

Vacant

Administration (recording ONLY)

Rudolf Liebenberg (Sandy Beach) (*regrets*)

**1.0 CALL TO ORDER**

Chair Michael Harney called the meeting to order at 12:00 p.m.

**2.0 ACCEPTANCE OF AGENDA**

MOVED by Jackie Tremblay that the agenda be approved as presented.

Res. # 23 - 21

CARRIED

**3.0**

MINUTES, June 3<sup>rd</sup>, 2021

Res. # 24 - 21

MOVED by Jackie Tremblay that the minutes of the June 3<sup>rd</sup>, 2021 meeting be accepted and approved as presented.

CARRIED

**4.0**

DELEGATIONS

none

**5.0**

APPOINTMENTS

none

**6.0**

BUSINESS ARISING

**A.**

Res. # 25 - 21

Lagoon Manager Contract

MOVED by Gordon Drybrough that the Lagoon Manager contract for the 2021 discharge be approved as presented in writing and the Committee authorize the Chair to sign it.

CARRIED

Res. # 26 - 21

Lagoon Chair expenses

MOVED by Jackie Tremblay that the lagoon discharge expenses of \$668.03 as submitted by the Chair Michael Harney be approved.

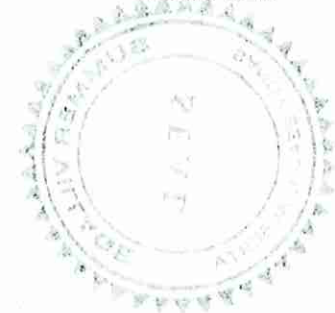
CARRIED

Chair Michael Harney abstained from voting.

**7.0**

DEVELOPMENT MATTERS

none





# MEMORANDUM



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TO: Michael Harney - Mayor  
Rudolph Liebenberg -CAO

FROM: Nedal Barbar/Chad Newton

PROJECT No.: 180347100

RE: Sandy Beach Existing Lagoon Summary &  
Recommended Upgrade Options

DATE: 11/17/2020

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P:\2018\180347100-ENGINEERING STUDY SANDY BEACH\08. WORKINGMEMO - RECOMMENDED OPTIONSMH MEMO -LAGOON IMPROVEMENT OPTIONS\_17NOV2020.DOCX

Morrison Hershfield was retained by the Summer Village of Sandy Beach to evaluate the performance of the existing lagoon and propose recommended options for improvement. Background information was reviewed, and the lagoon currently exceeds its capacity.

This memorandum summarizes existing conditions and proposed options for improvement to the evaporation lagoon onsite.

## Available Information

The following information was reviewed. No other data or reports were available.

- Project Binder supplied by the Summer Village
- Regional Lagoon Feasibility Study by Wardrop Alberta LTD, dated July 1990
- As-built drawings by Maxim Engineering, dated July 29, 1991
- Parts 3 and 4 of the *Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems* (March 2013)

## Existing System Conditions

The existing lagoon was constructed in Year 1991 and consists of three cells, a primary cell and two evaporation cells. Some of the berms are in need of repair and therefore the sewage level in lagoon will need to be lowered to accommodate the repairs.

Figure 1.0 shows a site plan of the area.



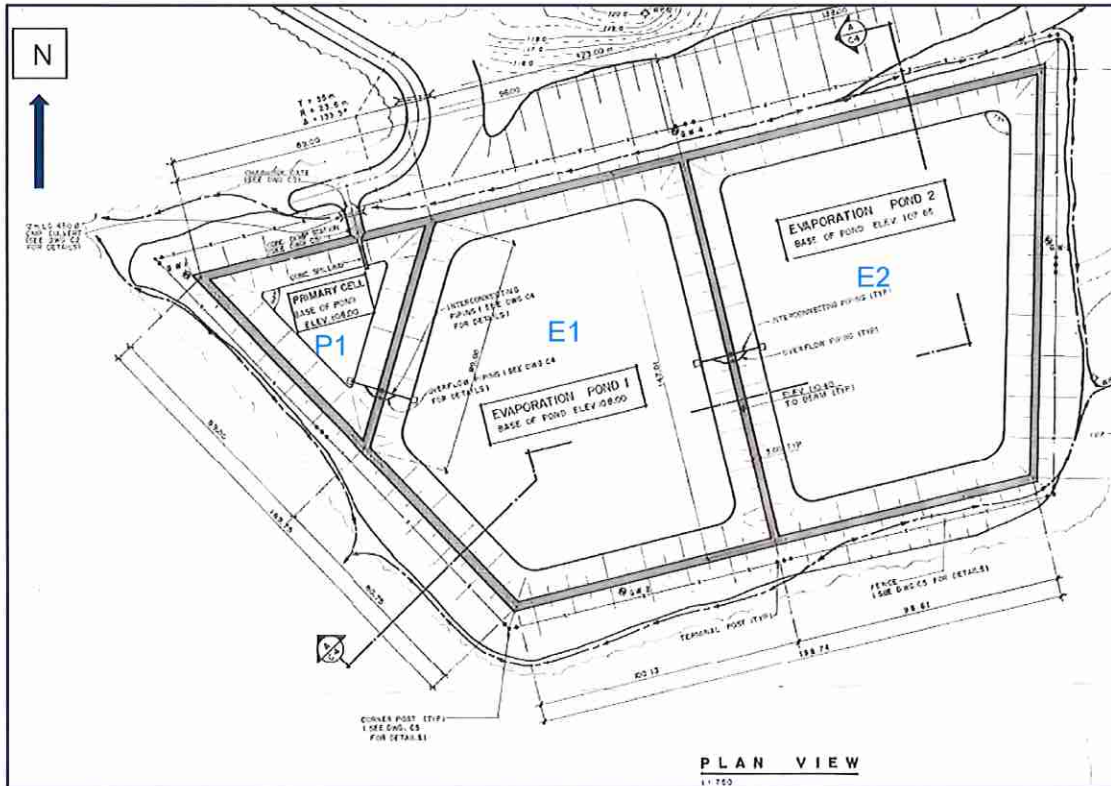


Figure 1.0

Table 1.0 shows the dimensions and volumes for all cells at maximum operation level but excludes freeboard. Original design included a Free Board (FB) of 0.9 m but currently the lagoon has a remaining freeboard of 0.1 m, therefore exceeding its capacity and occupying the freeboard area.

Table 1.0: Existing Lagoon Cells

Lagoon Cell	Treatment Cell	Side Slopes (H:V)	Max. Operation Liquid Depth	Liquid Volume m <sup>3</sup>	Liquid Surface Area m <sup>2</sup>	0.9 m Depth Freeboard Volume m <sup>3</sup>	Total Volume (includes FB) m <sup>3</sup>
P1	Primary Cell	4:1	1.50	2,460	2,100	1,890	4,350
E1	Evaporation Cell	4:1	1.50	20,660	15,200	13,680	34,340
E2	Evaporation Cell	4:1	1.65	20,020	14,850	13,365	33,385
Total				43,140	32,150	28,935	72,075

The lagoons are designed to hold a liquid volume of approx. 43,140 m<sup>3</sup> (without the freeboard volume), however, the liquid is currently at approx. 68,860 m<sup>3</sup> with approximately 0.1 m of freeboard remaining. The total available volume in existing lagoon is 72,075 m<sup>3</sup>, including the freeboard (28,935 m<sup>3</sup>).

This indicates that the freeboard depth is currently at 0.8 m and 89% of the design freeboard is occupied as shown in Table 2.0 below:

**Table 2.0: Existing Freeboard**

	Depth (m)	Approx. Volume (m <sup>3</sup> )	% of Total FB Volume
Design Freeboard	0.9	28,935	n/a
Occupied Freeboard	0.8	25,720	89%
Vacant Freeboard	0.1	3,215	11%

Approximately 25,720 m<sup>3</sup> of volume is in excess of the design capacity and needs to be relocated elsewhere through hauling, pumping, or a possible new lagoon cell in order to keep the existing lagoon running at its optimum operating capacity.

The *Regional Lagoon Feasibility Study* by Wardrop indicated that there will be a time in the design life of the lagoon where inflow will exceed evaporation. The lagoon level will continue to rise at that point until storage capacity is has been exceeded. The study stated a major discharge would be required to reduce the storage volume.

It appears this lagoon has passed that point and is currently reaching near the top of berm.

**Existing Lagoon Limitations**

At the time of design, the evaporation lagoon was designed based on a net evaporation rate of 180 mm/yr. This rate was confirmed to be near the calculated average based on available climate data from years 1980 to 2010. The existing cells were assessed to understand the sewage inflow limits. **Table 3.0** below shows that an influent of 15.9 m<sup>3</sup>/day (5787 m<sup>3</sup>/year) will evaporate from lagoon and not cause further increase in levels and will ensure the 0.9 m freeboard is available.

**Table 3.0: Influent Limitations of Existing Lagoon**

Influent Flow	m <sup>3</sup> /day	15.9
	m <sup>3</sup> /year	5,787
Net Evaporation Rate	mm/yr	180
<b>Primary Cells</b>		
Influent	m <sup>3</sup> /yr	5,787
Net Evaporative Water Loss in Lagoons	m <sup>3</sup> /yr	378
Effluent to Evaporation Cell #1	m <sup>3</sup> /yr	5,409
<b>Evaporation Cell #1</b>		
Influent from Primary Cell	m <sup>3</sup> /yr	5,409
Net Evaporative Water Loss in Lagoons	m <sup>3</sup> /yr	2,736
Effluent to Evaporation Cell #2	m <sup>3</sup> /yr	2,673
<b>Evaporation Cell #2</b>		
Influent from Evap. Cell #1	m <sup>3</sup> /yr	2,673
Net Evaporative Water Loss in Lagoons	m <sup>3</sup> /yr	2,673
Excess Effluent	m <sup>3</sup> /yr	-





Based on conversations with the Summer Village, there was approximately 10,500 m<sup>3</sup>/year (28.7 m<sup>3</sup>/day) being discharged into the lagoon, which is greater than the limit of 5787 m<sup>3</sup>/year (15.9 m<sup>3</sup>/day) available thru evaporation. Therefore, there is an excess of 4713 m<sup>3</sup> being dumped into the lagoon per year which explains why the freeboard is currently at 0.1 m versus 0.9 m. Based on the occupied freeboard volume of 25,720 m<sup>3</sup>, **it may have taken an estimate of 6-7 years for lagoon freeboard to fill to that level based on the excess rate of 4713 m<sup>3</sup>/year.**

It should also be noted that in 2009 it was recommended that a desludging of the lagoon should be completed. However, this recommendation was not completed, and the capacity of the lagoon was further reduced by the sludge volume.

### **Design Standards and Guidelines**

According to Parts 3 of the *Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems* (March 2013), Section 3.4.2.1 states the following for evaporation ponds:

- "For systems with average daily design flows of less than 250 m<sup>3</sup>, the system may be designed with one evaporation cell. Provision must be made at the inlet to the cell for settlement and removal of sludge."
- "In no case shall an evaporation lagoon provide less than 3 years of storage capacity based on average daily design flows."
- "Evaporation cells shall not have a depth greater than 1.5 m."

One of the evaporation cells, Cell E2, is a little over the depth limit but still acceptable (1.65 m vs 1.5 m). The minimum volume required based on a 3-year storage capacity and a daily average sewage flow of 26 m<sup>3</sup>/d (Year 2016) would be approximately 28,000 m<sup>3</sup>. The current lagoon volume exceeds this amount, however, the design should consider the rate of evaporation in sizing the surface area of the lagoon.

### **Recommended Options for Improving Lagoon Operation**

Based on the existing conditions onsite, we have proposed 4 options for improving the function of this existing lagoon. **All options will require desludging.** A discharge extension which has been requested by MH to Alberta Environment would be required to bring the sewage level down further so repairs can be made. All options are discussed below:

1. **Option 1:** Discharge existing lagoon to a water level to allow repair to berms. Approval by Alberta Environment will be required prior to discharge. Restrict the capacity of the facility to 15.9 m<sup>3</sup>/day (5,787 m<sup>3</sup>/yr) and haul the rest 12.9 m<sup>3</sup>/day (4713 m<sup>3</sup>/yr) to another lagoon nearby. Long term hauling contract with Onoway or another facility would be required.
2. **Option 2:** Upgrade the system to 30 m<sup>3</sup>/day (10,950 m<sup>3</sup>/yr) by constructing another evaporation cell with a total surface of area of approximately 29,000 m<sup>2</sup>. A sketch of Option 2 is shown below in **Figure 2.0**.

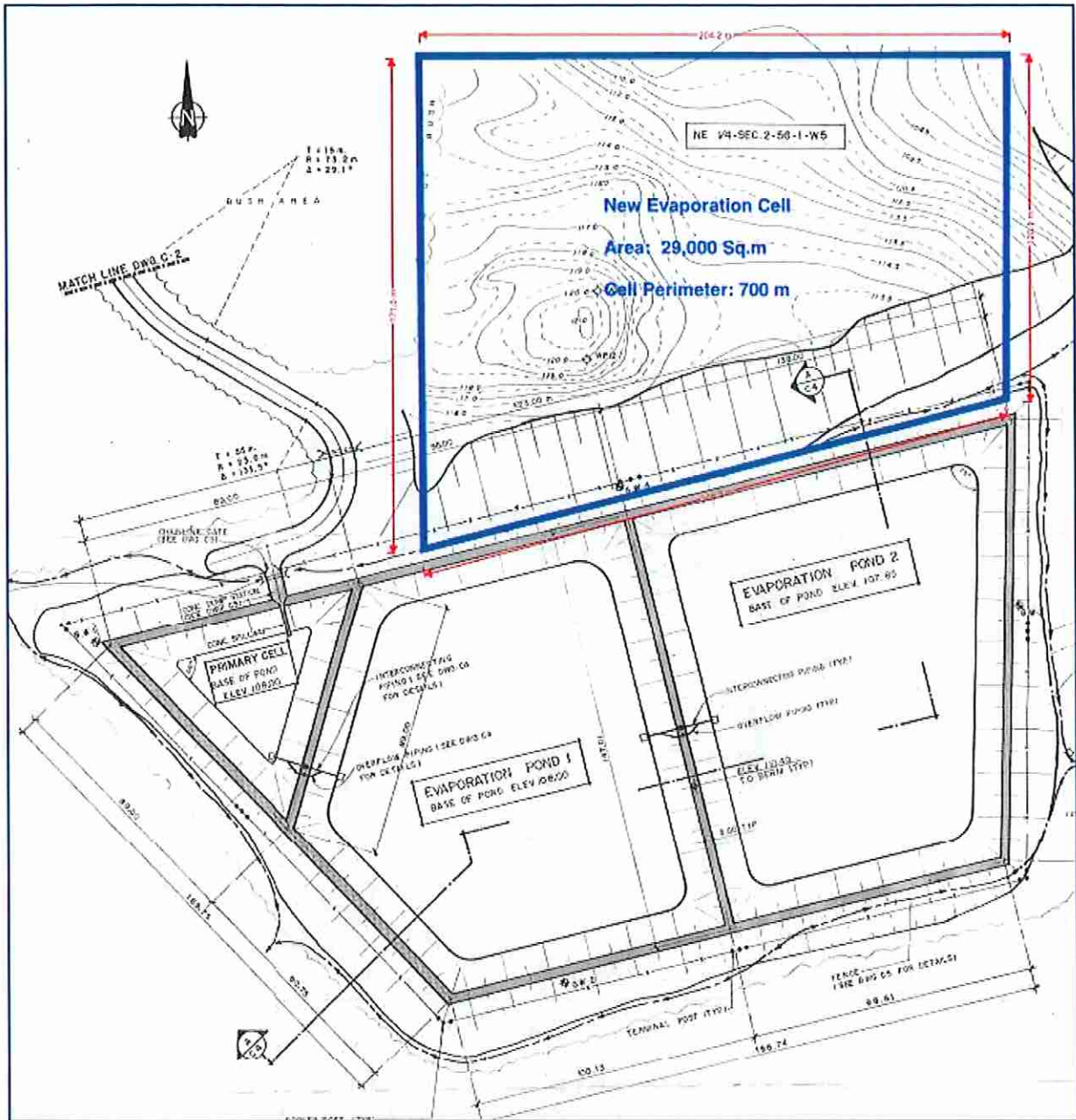


Figure 2.0

- Option 3:** Construct a conventional lagoon that consists of a primary cell with a storage volume of 2,700 m<sup>3</sup> (includes freeboard) and storage cell with a volume of 13,000 m<sup>3</sup> (includes freeboard) based on the inflow of 28.7 m<sup>3</sup>/day (10,500 m<sup>3</sup>/year). The storage cell will need to be deeper at 3.0 m with an outlet that is directed to Bard Lake. This option is subject to approval by Alberta Environment and the First Nation Reserve neighboring Bard Lake. A sketch of Option 3 is shown below in Figure 3.0. Decommissioning of the existing evaporation pond may be required.



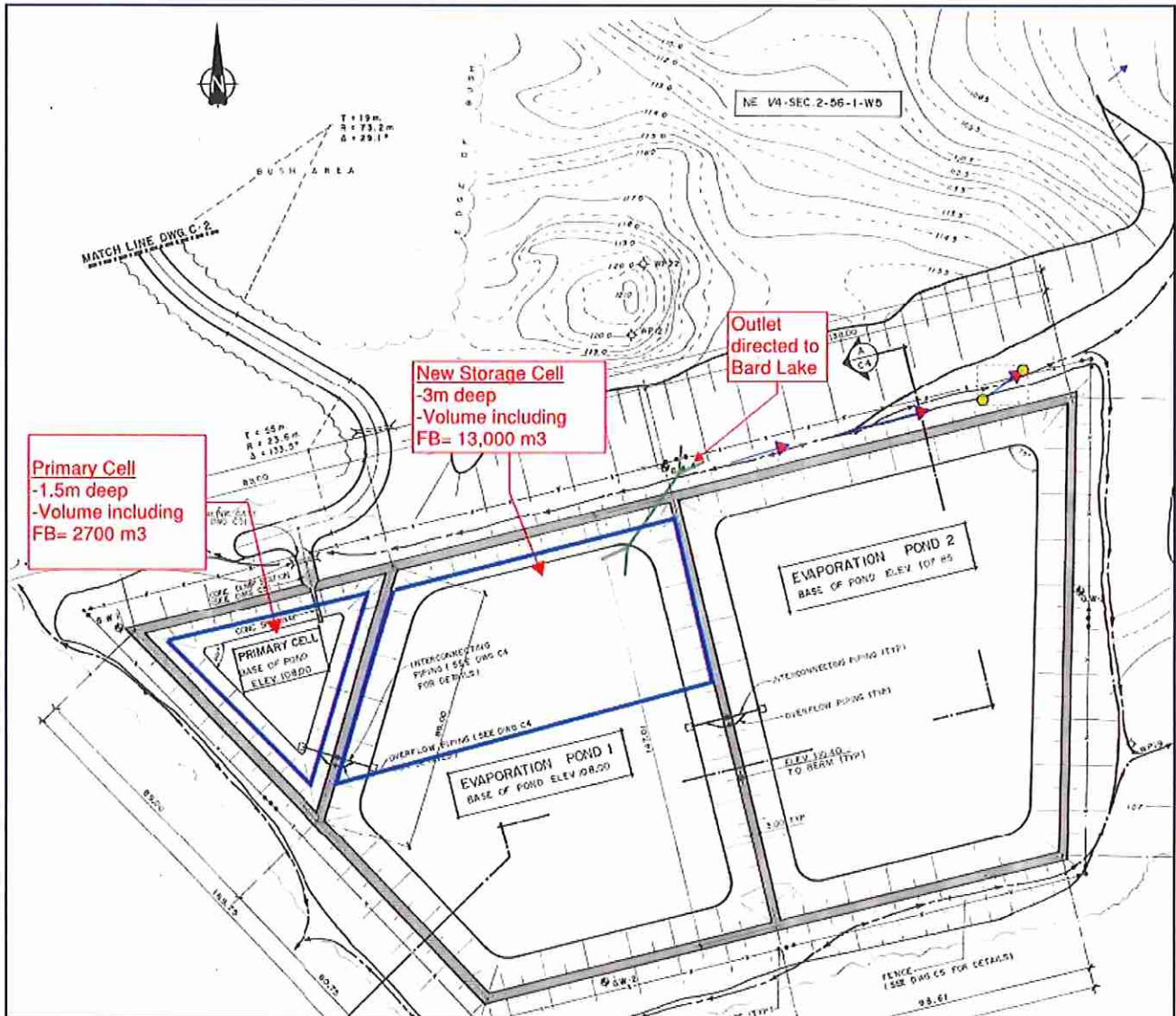


Figure 3.0

- Option 4:** Leave Lagoon operational but not in operation. Discharge existing lagoon to a water level to allow repair to berms. Approval by Alberta Environment will be required prior to discharge. Monitoring and reporting will be required to maintain lagoon capacity levels as required by Alberta Environment. Redirect all sewage to another lagoon for a period of time until volume is available in the cells. Hauling contract with Onaway or another facility required.

**Costs:**

Costs for each option are shown below in Table 4.0. The additional cost for Option 4 is negligible as the only costs that occur are desludging and repair to eroded berms. **Desludging of all cells is required by all options, and have been included in cost estimate.** Berm repair was assumed to be within the freeboard depth of Evaporation Pond 2 only.

**Table 4.0: Cost Estimates for Each Option**

	Total Cost
Option 1 - Restrict Inflow to 15.9 m <sup>3</sup> /day*	\$ 252,000
Option 2 - Evaporation Cell	\$ 2,531,000
Option 3 - Conventional Lagoon	\$ 1,119,000
Option 4 – Haul to Another Lagoon Offsite*	\$ 258,000

\*Option 1 & 4 require an additional \$4713/year and \$10,500/year, respectively.

Detailed breakdown of this conceptual estimate is provided in **Appendix A**. Note that Option 1 and Option #4 would require an additional \$4713 per year and \$10,500 per year, respectively, for hauling to Onoway or another facility.

**Note that the costs above are within ± 30% error.** As design progresses, more accurate cost estimates can be provided.

**Funding:**

Research was completed on possible grants for water and wastewater systems in Alberta. The following are possible sources of funding for this project:

1. *Water for Life Program* – Provides cost-shared funding to regional commissions or groups of 2 or more municipalities and consists of 2 funding streams. One stream for new infrastructure and one for existing infrastructure.
2. *Alberta Municipal Water/Wastewater Partnership (AMWWP)* – Provides cost-shared funding to eligible municipalities to help build municipal facilities for water supply and treatment, and wastewater treatment and disposal.

Grant application are due yearly by Nov 30<sup>th</sup>, 2020. Engineering and repairs should be applicable.

Should you have any questions or concerns, please feel free to contact the Chad Newton or myself.



Yours truly,  
Morrison Hershfield Limited



Chad Newton, MBA, PMP, Principal  
PM Department Manager West,  
Senior Project Manager

Nedal Barbar, P.Eng  
Project Engineer

Morrison Hershfield Limited  
APEGA PERMIT TO PRACTICE P2277

Brian Fanson, P.Eng.



Nov 18, 2020

Attached: Appendix A: Cost Breakdown



## Appendix A - Detailed Cost Breakdown for Each Option

### Summary

	Total Cost
Option 1 - Restrict Flow to 15.9 m3/day	\$ 252,134
Option 2 - Evaporation Cell	\$ 2,531,313
Option 3 - Conventional Lagoon	\$ 1,118,572
Option 4 - Haul to Another Lagoon	\$ 257,921

Option - 1 (Restrict to 15.9 m3/day)					
Item	Unit	Qty	Unit Rate	Cost	
Additional Delta Hauling Costs	m3	4,713	\$ 1.00	\$ 4,713	
Additional cost to haul to Onoway vs Current Lagoon	LS	1	\$136,627	\$ 136,627	
Sludge Removal and Disposal	m <sup>3</sup>	3187	\$20	\$ 63,748	
Repair to Berms (assumed just freeboard area of berm)	LS	1	\$33,846	\$ 33,846	
Pumping between Cells	LS	1	\$4,400	\$ 4,400.00	
Sewage Sampling	LS	1	\$8,800	\$ 8,800.00	
Environmental Sampling for Sewage Disposal on Agricultural Land					
			<i>Sub Total</i>	\$ 252,134	
<b>Total Cost</b>				\$ 252,134	

\* assumed current rate to original lagoon is ~\$4/m3

\* new rate assumption \$5/m3

\* these costs would be either absorbed by municipality or paid directly onto residents

Option - 2 (Haul to Another Lagoon Offsite)					
Item	Unit	Qty	Unit Rate	Cost	
Additional Delta Hauling Costs	m3	10,500	\$ 1.00	\$ 10,500	
Additional cost to haul to Onoway vs Current Lagoon	LS	1	\$136,627	\$ 136,627	
Sludge Removal and Disposal	m <sup>3</sup>	3187	\$20	\$ 63,748	
Repair to Berms (assumed just freeboard area of berm)	LS	1	\$33,846	\$ 33,846	
Pumping between Cells	LS	1	\$4,400	\$ 4,400.00	
Sewage Sampling	LS	1	\$8,800	\$ 8,800.00	
Environmental Sampling for Sewage Disposal on Agricultural Land					
			<i>Sub Total</i>	\$ 257,921	
<b>Total Cost</b>				\$ 257,921	

\* assumed current rate to original lagoon is ~\$4/m3

\* new rate assumption \$5/m3

\* these costs would be either absorbed by municipality or paid directly onto residents

Option - 3 (Conventional Lagoon)					
Item	Unit	Qty	Unit Rate	Cost	
New Storage and Primary Cell					
Topsoil and subsoil Stripping 1m deep	m <sup>3</sup>	7405	\$5	\$ 37,026	
Topsoil Placement (150mm depth)	m <sup>3</sup>	7405	\$1.5	\$ 11,108	
Pond Storage Excavation	m <sup>3</sup>	6500	\$10	\$ 65,000	
Clay Bottom Placement (1.0m Thick)	m <sup>3</sup>	7405	\$20	\$ 148,105	
Wave protection on side slopes (250mm Thick)	m <sup>2</sup>	594	\$65	\$ 38,610	
Containment Berms	m <sup>2</sup>	12882	\$20	\$ 257,645	
Hydroseed	m <sup>2</sup>	7405	\$1.0	\$ 7,405	
Sludge Removal and Disposal	LS	1	\$136,627	\$ 136,627	
Pumping between Cells	LS	1	\$33,846	\$ 33,846	
Sewage Sampling	LS	1	\$4,400	\$ 4,400.00	
Environmental Sampling for Sewage Disposal on Agricultural Land	LS	1	\$8,800	\$ 8,800.00	
Control/Overflow Manhole or Chamber	each	1	\$35,000	\$ 35,000	
Slush Pad	LS	2	\$10,000	\$ 20,000	
Outlet Pipe	LS	1	\$25,000	\$ 25,000	
			<i>Sub Total</i>	\$ 828,522	
Mob/Demob/Insurances			10%	\$ 82,852	
Contingencies and Engineering			25%	\$ 207,143	
<b>Total Cost</b>				\$ 1,118,572	

Option - 2 (New Evaporation Cell)					
Item	Unit	Qty	Unit Rate	Cost	
New Evaporation Cell					
Topsoil and subsoil Stripping 1m deep	m <sup>3</sup>	29000	\$5	\$ 145,000	
Topsoil Placement (150mm depth)	m <sup>3</sup>	29000	\$1.5	\$ 43,500	
Pond Storage Excavation	m <sup>3</sup>	40000	\$10	\$ 400,000	
Clay Bottom Placement (1.0m Thick)	m <sup>3</sup>	29000	\$20	\$ 580,000	
Wave protection on side slopes (250mm Thick)	m <sup>2</sup>	480	\$65	\$ 31,200	
Containment Berms	m <sup>2</sup>	14969	\$20	\$ 299,376	
Hydroseed	m <sup>2</sup>	29000	\$1.0	\$ 29,000	
Sludge Removal and Disposal	LS	1	\$136,627	\$ 136,627	
Repair to Berms (assumed just freeboard area of berm)	m <sup>3</sup>	3187	\$20	\$ 63,748	
Pumping between Cells	LS	1	\$33,846	\$ 33,846	
Sewage Sampling	LS	1	\$4,400	\$ 4,400.00	
Environmental Sampling for Sewage Disposal on Agricultural Land	LS	1	\$8,800	\$ 8,800.00	
Control/Overflow Manhole or Chamber	each	1	\$35,000	\$ 35,000	
Slush Pad	LS	2	\$10,000	\$ 20,000	
Install Fence	m	495	\$90	\$ 44,550	

Statement date July 31, 2021  
 Transit number  
 Customer number  
 Page number 1 of 1

SANDY BEACH AND SUNRISE BEACH  
 JOINT LAGOON COMMITTEE  
 JOINT LAGOON AUTHORITY  
 COMP 63 RR 1 SITE 1  
 ONOWAY AB T0E 1V0



### Your ATB Financial Branch

08989 Onoway Branch  
 4910 50 St  
 Onoway AB  
 T0E 1V0

If you have any questions, contact us at  
 1 800 332-8383 or visit us at  
[www.atb.com](http://www.atb.com)

### A summary of Deposit Account Pay As You Go Account

Your balance forward on Jun 30, 2021	\$3,137.53
Debits to your account (1 item)	\$8.00
Credits to your account (0 items)	\$0.00
<b>Your closing balance on Jul 31, 2021</b>	<b>\$3,129.53</b>

### Details of your account transactions

Date	Description	Debits to your account (\$)	Credits to your account (\$)	Balance (\$)
Jun 30	Balance forward			\$3,137.53
Jul 31	Monthly Maintenance Fees	\$8.00		3,129.53
Jul 31	Closing balance			\$3,129.53

Find an error? Give us a call or drop by a branch. We'll take care of it.

Good morning, Chad, hope all is well and that you had a good summer.

Between our two villages we have 4 new councillors so there will be a fair bit of updating new members on this project. For your info we have a new lagoon manager Brett Henkel with CB Max. out of Stoney Plain. cell 780-903-6032 email [brett@cbmax.org](mailto:brett@cbmax.org)

On Monday Sept 6 we took measurements. Our water level is presently 43 to 44 inches below top of berm, and 6 inches below our max fluid level. We cleared the emergency crossover pipe about 3 weeks ago and are still syphoning on a 2-inch line, and will continue (with monitoring) until end of sept. Can we set up a time when you or associate can come out to inspect the lagoon?

Also, as previously discussed option 2 (lagoon expansion) still appears to be the desired long-term solution. I also went out to Duffield and got some information on the evaporators that they are using on their lagoon. I would like approximate costs for the next engineering phase of this project to present to lagoon committee. I assume we will need some specifics to present to Environment in order to do a lagoon expansion, and apply for funding grants. Please send a short confirmation of receipt of this email.

I look forward to speaking with you soon.

Sincerely Mike Harney