THE RESORT VILLAGE OF
CANDLE LAKE

REPORT

Report Title: Lagoon Assessment, Maintenance and Repairs

(Report # 107/2015)

Date: September 09, 2015
Prepared By: Doug Allan
Prepared For: Council

RECOMMENDATION: That Council authorized the transfer of funds from the Lagoon Reserve account to the General account to pay for costs incurred to bring the lagoons to full functionality.

Justification for In Camera:

Background: In the summer months when there was extreme heat, the maintenance manager noticed the bloom of blue algae. This condition indicates a lack of oxygen in the holding cells of the lagoon. Another condition noticed, was that both lagoons were maxed out and operating on their overflows. The Manger contacted the Water Security Agency (WSA) and upon their recommendation a Process Specialist was called in.

The Specialist did an evaluation (attached) on how the system was operating and recommended changes to have it function as intended. During that process, which takes a number of weeks, it was discovered that there were a number of valves that were not operating rendering the primary cells isolated and non-functional.

The lagoon is undergoing a third round of discharge with the supervision and permission of the WSA providing the Village stays within its discharge perimeters. The process will require a fourth round of discharge in order to get the number 2 cells on both lagoons low enough to access the valves. Normally the number 2 cells would be empty in the spring or fall. WSA will be attending the site September 10 in order to monitor and permit a fourth discharge.

WSA has a Federal oversight person that has been working with the Village to ensure compliance. This person is assigned to red flag locations. Red flag locations are sites whereby effluent can reach fish bearing water.

At this time the lagoons are not operating due to the valve malfunctions. The discharge valve is locked open… liquid from cell number 1 was being transferred directly to cell number two. This is the likely chain of events that led to the algae bloom. We have approximately 12 "" of freeboard before we have to start using the overflow.

Discussion: What is required now is the repair/replacement of three valves – 2 in the east lagoon and 1 at the west lagoon. The assessment will require the expertise of persons with confined space certification. As time is of the essence, WS Industrial has been contacted to take part in the assessment as well as ATAP Management. Both parties will render a cost for the assessment. Attached is the proposed cost from ATAP. At the time of writing, WS Industrial has not visited the site or supplied a cost to perform the assessment.

The cost for repairs would be covered using the lagoon reserve funds that have been allocated to that reserve for just such circumstances.

Options:

1. That Council authorized the transfer of funds from the Lagoon reserve account to the general account to pay for costs incurred to bring the lagoons to full functionality.
2. That Council direct administration to tender out the project.

Financial Implications:

Communications:

Attachments:

1. Email from Process Specialist along with recommendations
2. ATAP proposal for review and assessment

Conclusion: There are not a lot of options open due to the necessity of the repairs and the time of the year. Valves may be repaired, but in the meantime, once they are disassembled and sent for repair, there will not be a functioning valve in that location. Administration is recommending that should the assessment prove out as anticipated that the valves be replaced.

Respectfully submitted,

Doug Allan, Maintenance Manager

From: "Bertrand Gaudet" <bertrandg@sasktel.net>
Subject: Lagoons, c/o Doug Allan
Sent date: 09/02/2015 08:24:40 AM
To: <rvcandlelakeoffice@sasktel.net>
Attachments: 2 attachments - **Download all attachments [833 KB]**
15083111 GSTS, Candle Lake.pdf [386 KB], Candle lagoon inspection.pdf [447 KB]

Hi Doug,

The last site visit has showed vast improvements both in the maintenance and in the operations of both lagoons.

Congratulations are in order for you and your crew in public works, hard work has brought back the lagoons to what operating conditions.

Good Job!

B- -trand (Bert) Gaudet

Gaudet's Sci Tech Services

RR5 site34 comp80

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306-961-4088

Gaudet's
Scientific Technical Services

RR #5, Site 34, Comp 80
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Phone: (306) 961-4088
Email: bertrandg@sasktel.net

2 September 2015

Doug Allan, public works director
Resort Village of Candle Lake

Re: Lagoon Operations

The last site inspection/training session was completed on the 24 August 2015.

All work that was identified from the site visit of July 29, 2015 has been completed.

The lagoons at the time were being released with the permission from the WSA and are looking healthy. Once the releases are done the lagoons will be ready for winter operation.

It seems that in the past that the releases were incomplete causing hydraulic over loading of the lagoons. With the release of the storage lagoons the hydraulic loading has been corrected.

Also all signs that are required by the permit are up and the fencing is in good repair.

There was a sense of disorganization in the first visit, improper filing no volume release calculations and no records of the release analysis. This has been corrected and the information is now being filed, data is collected and volume release is being calculated. These are all necessary as per the permit to operate, these files must be kept for five years.

The west lagoon was being released so some work can be done on the berms, Duckweed has been raked off. This weed is a constant nuisance and must be rake often to keep it under control.

The east lagoon has been aerated and the blue/green algae is under control on the storage the release has brought the hydraulic overloading under control. Also the outfall area has been cleaned up and riprap has been placed at the outfall.

During the release it was noted that the equalization valve between the primary and secondary is not holding and leaking, operator closed the isolation valve during the release. This valve must be repaired since it holds the primary to operating depths in the summer.

As in the last report the following is the narrative of operation, there were errors which are address in this report, there is a control structure between the secondary and tertiary cells on the east lagoon. Also a narrative has been constructed for the west lagoon:

Typically the east lagoon should operate:

In the spring the primary pond should be isolated. If the tertiary pond is full (normally over winter the only water would be from precipitation) the tertiary pond opened for release if the tertiary has room then the secondary transfer should be done to fill the tertiary pond for the first release (a slow release) and the transfer valve from the secondary to the tertiary is closed to allow release volume calculation. The release should last a week to ten days. At the end of the first release the secondary valve is then open to allow the tertiary to fill and is also released.

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This should continue until the secondary and tertiary are at release level meaning that both ponds have reached the out fall pipe. At this point the secondary transfer and the tertiary release valves are closed. The equalization valve should be opened to equalize the primary and secondary.

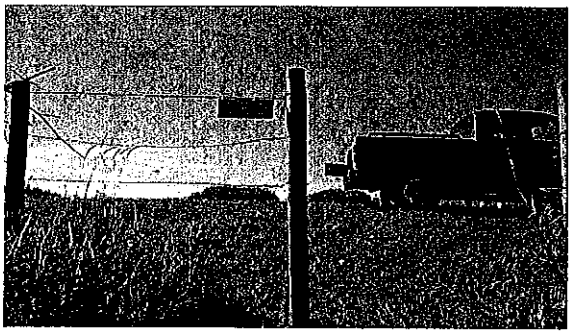
At the end of equalization both the primary and the secondary lagoons are about ½ to ¾ full and the tertiary should be at the outfall pipe level. The equalization valve it then closed and the primary is allowed to fill. The primary will fill until it reaches the operating level and over flows through the transfer structure, not the overflow pipe to the secondary. The secondary will fill and operator as needed will transfer through a control structure to the tertiary pond this is summer operation. In winter the equalization valve between the primary and secondary is left open to allow better treatment over the winter months. Release can be made in spring and fall, but if possible maintain one release a year is beneficial and release should be made in spring during runoff.

Typically the West lagoon should operate:

In the spring the primary pond should be isolated. The secondary pond is release (a slow release) and release volume calculation are done. The release should last a week to ten days. At the end of the release the secondary should be at release level meaning that cell have reached the out fall pipe. At this point the release valve is closed and the equalization valve should be opened to equalize the primary and secondary.

At the end of equalization both the primary and the secondary lagoons are about ½ to ¾ full. The equalization valve it then closed and the primary is allowed to fill. The primary will fill until it reaches the operating level and over flows through the transfer structure, not the overflow pipe to the secondary this is summer operation. In winter the equalization valve is left open to allow better treatment over the winter months. Release can be made in spring and fall, but if possible maintain one release a year is beneficial and release should be made in spring during runoff.

East Lagoon improvements:

	
Outfall has been cleaned up with riprap installed	New signage and access to outfall.

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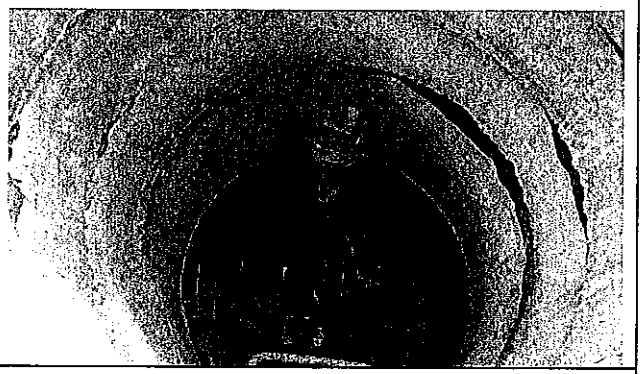
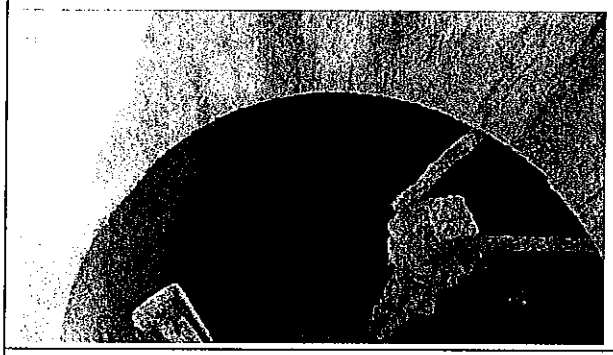
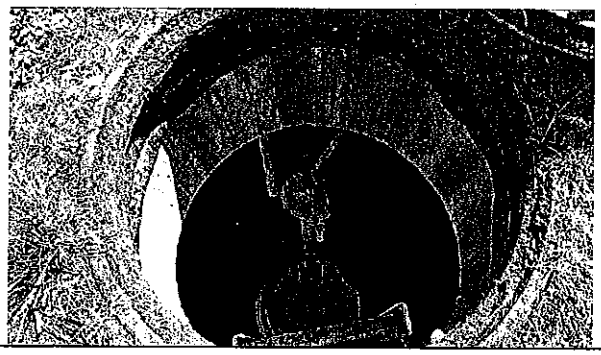
	
Tertiary after release	Control structure between secondary and tertiary.
	
Transfer structure between primary and secondary, leaking valve.	Transfer structure between primary and secondary, leaking valve.

The operations of the lagoons has greatly improved over the last few weeks, congratulations to the operator Doug Allan and the staff of the public works.

GSTS would strongly recommend that Doug Allan apply for the class one operating certification. He has one year experience in operating the lagoon, he has had on site training and completed and passed the level one exam.

Good luck and phone if you have any questions. 306-961-4088

Bertrand Gaudet, A.Sc.T.

Process Specialist

Gaudet's Sci Tech Services

Advanced Technology Applications

ATAP Infrastructure Management Ltd.
1-2225 Northridge Drive
Saskatoon, Saskatchewan, Canada S7L 6X6

Tel 306.244.8828
Fax 306.244.8829
www.atap.ca

September 4, 2015
File: prp_064

ATTN: Doug Allan, Foreman

Resort Village of Candle Lake
Box 114
Candle Lake, SK S0J 3E0

[via Email: candlepublicworks@sasktel.net]

Dear Doug:

RE: RESORT VILLAGE OF CANDLE LAKE
LAGOON CONTROL STRUCTURES VALVE MAINTENANCE/ASSESSMENT

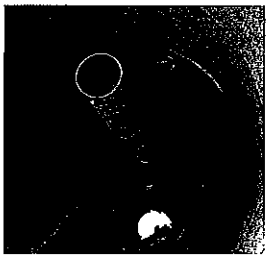
As follow-up to our recent telephone discussion, ATAP Infrastructure Management Ltd. (ATAP) is pleased to provide the Resort Village of Candle Lake (Village) with a proposal for valve maintenance and assessment at its sewage lagoon control structure, for your consideration and approval.

1 BACKGROUND

The Resort Village has transfer valves located in manholes in the berm, between the newer treatment, storage cell, and the two storage cells of the facultative lagoon, which have become inoperable. These valves need to be maintained, or replaced, in order to ensure effluent is transferred appropriately between cells.

2 SCOPE OF SERVICES

ATAP will perform an initial site visit to view and assess the valve(s) at both locations noted above. The Technicians will perform maintenance on the valves, if they are able to do so. If it is determined that the best option is to replace the valve(s), an estimate will be provided to the community, for your approval, and a return visit will be scheduled for the supply and installation of the equipment.



A vacuum truck will be required during our visit, in order to lower the effluent level within the manhole, so that the valves can be accessed.

On our initial site visit, **ATAP** will provide the following:

- Two Technicians to safely inspect and assess the valves. Maintenance will be performed, or determine if replacement is the best option;
- The following safety equipment which meets OH&S requirements for confined space entry (CSE):

  - CSE retrieval device to be located at the entrance and exit of the confined space;
  - Harnesses for ATAP personnel;
  - 1- Turbo-ventilator to be positioned at opening of the reservoir;
  - Atmosphere testing equipment: 2- 4 gas monitors (1 to monitor from the top of the confined space and one to be worn by Technician);
  - Auxiliary lighting for the confined space;
- Sufficient equipment/tools for the procedures; and
- A letter report upon completion.

The **Resort Village** will provide the following materials and services:

- Vacuum truck for emptying the manhole chamber(s); and
- Assurance that a knowledgeable Operator, trained in CSE procedures, is on-site during all inspection, and maintenance procedures.

3 PROPOSED DATES

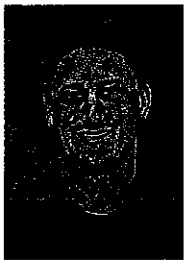
Upon authorization to proceed, we will co-ordinate a mutually agreeable date this fall for the initial site inspection.

4 PERSONNEL

ATAP will provide two of the following Technicians, each of whom has many years of operation and maintenance experience:

Phil Beaulac, Water & Wastewater Systems Specialist

Phil has over 10 years of industrial maintenance experience including 6 years of water and wastewater operations, and 5 years of welding and construction experience. He has also worked extensively in business management. Phil is certified Class 2 in Water Treatment, Water Distribution, Wastewater Treatment and Wastewater Collection. His principal work at ATAP is working with northern water & wastewater Saskatchewan operators in the NMTA Circuit Rider Program. In addition to water, wastewater, and technical skills, Phil is also a Power Mobile Equipment operator evaluator.



Joshua Buniak, Operation & Maintenance Technician

Josh has 14 years of combined operational experience in the public works and mechanical technology fields. He is a certified municipal water and wastewater operator with Class 2 in Water Treatment, Water Distribution, Wastewater Treatment, and Wastewater Collection. Josh is also a Certified Thermographer (infrared photographer). He provides multiple technical field services such as reservoir cleaning and inspection,

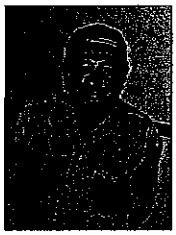
unidirectional flushing, swabbing, maintenance repairs and condition assessments for ATAP's clients. Josh also instructs water and wastewater courses and workshops, and evaluates operators of Power Mobile Equipment.

Andrew Hickey, Water & Wastewater Technician

Andrew has over 7 years of experience in water and wastewater treatment. He is certified Class 4 in Water Treatment, Class 3 in Water Distribution and Wastewater Collection, and Class 2 in Wastewater Treatment. Additionally, Andrew has a Water and Wastewater Certificate from the Saskatchewan Institute of Applied Arts and Sciences (SIAST). As a Technician, he provides multiple technical field services such as jar testing, filter optimization, reservoir cleaning, hydrant maintenance, water main flushing, swabbing, and system maintenance/repairs. Andrew is a certified AWWA Cross Connection Control Specialist. He instructs water and wastewater certification prep. courses and workshops. Andrew is an Associated Member of Saskatchewan Applied Science Technologists & Technicians (SASTT).

Bertrand Gaudet, A.Sc.T., Process Specialist

Bert has over 30 years of experience in Industrial Analytical Laboratories in three different industries: Potash, Natural Gas, and Pulp & Paper. He is an experienced Chemical Engineering Technologist in these fields. Additionally, Bert is certified at Class 3 in Water Treatment and Water Distribution, and Class 1 in Wastewater Treatment & Wastewater Collection. His main experiences in Industry are optimization of plant process to improve the quality and production of product and assistance to operators in troubleshooting their operations, mostly involving the process water, potable water, process waste and the environment. Bert has participated in setting up quality control and quality assurance in SOP development and the processes he has been involved with.



Garry Tenaschuk, C. Tech, Operation & Maintenance Manager

Garry has 40 years of experience providing training, guidance and technical assistance to system operators and communities. Twenty of these years were in developing and implementing operator training programs to assist with proper operation and maintenance of municipal systems. Garry is a journeyman, inter-provincial plumber/pipefitter and an industrial instrumentation technician. He is certified as Class 3 in Water Treatment, Water Distribution, and Wastewater Collection, and Class 2 in Wastewater Treatment.

5 FEE PROPOSAL

ATAP would perform the above work as noted in this proposal. We can only provide these services for the benefit of the Resort Village of Candle Lake, if the Village agrees to indemnify

and hold harmless ATAP, ATAP's employees and contractors against any and all claims arising from, or as a result of, the provision or non-provision of the services. Any agreement for services would require the above-referenced indemnification.

ATAP will provide the above services during our initial site visit for a **fixed fee of $4,750.00**, plus applicable taxes.

Invoices are rendered monthly and are due upon receipt.

Please call (306) 244-8828 if you have any questions or require further clarification. If this proposal meets with your requirements and you wish to proceed, please sign the authorization below and fax or email it back to our office as soon as possible.

ATAP Infrastructure Management Ltd. appreciates the opportunity to provide this quote for your consideration. We look forward to working with Resort Village of Candle Lake in its effort to improve its sewage lagoon infrastructure and to safeguard the local environment.

Respectfully submitted,

ATAP INFRASTRUCTURE MANAGEMENT LTD.

Ken Turnbull, Project Manager	Andrew Stevenson, ATAP Manager	Bert Munro, P.Eng., FCSCE, FEC, FGC (Hon), Vice President & General Manager

KT/cl

ATAP INFRASTRUCTURE MANAGEMENT LTD.
AUTHORIZATION TO PROCEED

RE: RESORT VILLAGE OF CANDLE LAKE
LAGOON CONTROL STRUCTURES VALVE MAINTENANCE/ASSESSMENT

RESORT VILLAGE OF CANDLE LAKE ***(Signature)*** ***(Date of Signed Agreement)***

(Print Name)

Resort Village of Candle Lake
Bank Reconciliation
Gen Bank Account 110-110-120
Adv. Credit Union, Candle Lake Branch
August 31 2015

	Bank Statement Balance August 31/15	**2,499,459.58**
ADD:		
	Outstanding Deposits	65,974.05
	Outstanding Deposits	
	Debit:	191,523.50
	Preauthorized Batches	14,216.49
	Outstanding Deposits	
LESS:		
	Outstanding Cheques and Withdrawals:	-116,711.88
	Payroll	
	Council	
	Fire	
	Adjusted Bank Statement Balance	**2,654,461.74**

	General Ledger Balance August 31/15	2,663,940.79
Items not posted to the general ledger:		
	First Data Charges	(7,449.86)
	RBC LOAN	(19,930.00)
	Interest	393.67
	Caft Fees	(48.25)
	Deposit - Aug 10/15	29,500.00
	Reverse Tax Receipt	(172.66)
	Bank Fees	(1.22)
	General Ledger Adjustment	(11,770.73)
	Adjusted General Ledger Balance August 31/15	**2,654,461.74**

Variance	0.00