CITY OF KAWARTHA LAKES

OMEMEE BEACH PARK

SPLASH PAD FEASIBILITY STUDY

October 2023
Updated March 2024

Prepared for:

City of Kawartha Lakes
50 Wolfe Street
Lindsay, Ontario K9V 2J2

Attention: Mr. Ryan Smith

Prepared by:

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City of Kawartha Lakes
Omemee Beach Park
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City of Kawartha Lakes
Omemee Beach Park
Splash Pad Feasibility Study

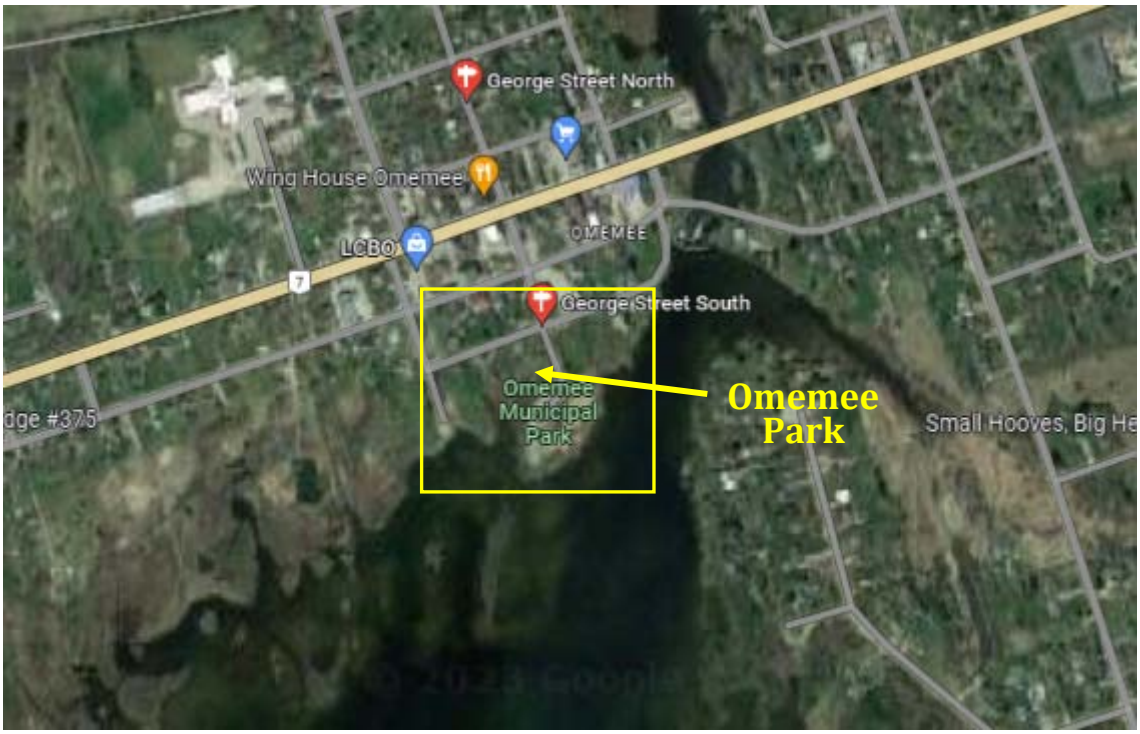
We have prepared this summary of requirements for the proposed Omemee Beach Park Splash Pad located at Rutland Street East and George Street, Omemee for the City of Kawartha Lakes. We conducted a site review to explore the existing conditions on June 27, 2023.

A. GENERAL DISCUSSION

The City of Kawartha Lakes is considering construction of a public splash pad in Omemee, in the George Street area (Omemee Municipal Park), adjacent to the Pigeon River.

A splash pad is an immersive zero depth aquatic play area enjoyed by many on those hot summer days. Many fixtures are available providing a range of fun filled splashing. A water park splash pad makes it easy for everyone to participate, from toddlers to grandparents. A full spectrum of safe play experiences makes the splash pad accessible for children of all abilities and parents can enjoy peace of mind while having fun.

Many factors should be considered in the decision to proceed. These are outlined in the following sections.



KEY PLAN

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OMEMEE MUNICIPAL PARK

B. WATER USAGE

Water is essential to any water park. The considerations as to the source of the water are fundamental to the performance of the water park. The following are our observations based on this site.

Water Usage

The essence of a splash pad/water park is the water. There are many fixtures and features that are now available, providing a wide range of fun for the users. The water consumption of these fixtures varies widely and should be tailored to the amount of water available. The consumption could range from 20m^3 to 100m^3 per day, depending on fixtures selected.

Depending on the availability of water, the 'handling' of the water can vary.

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There are many water fixtures available for splash pads. The shape options of the pad are infinite, subject to the imagination of the designer (and budget). Generally, splash pads are free formed, to provide a fun play area with corresponding fixtures.

Three (3) levels of features are considered for this site.

Low Volume Features

Low volume fixtures generally include spray fixtures that minimize water usage. This is accomplished through misting and light sprays.

Samples include:

Misters

Jets and Sprays

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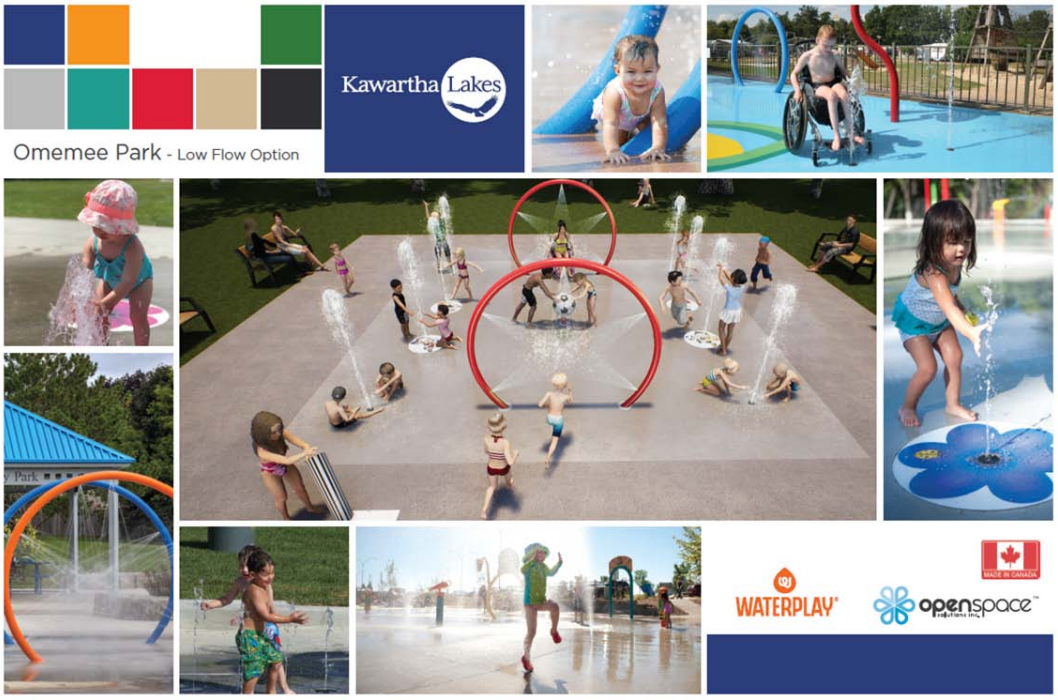

Concept – Low Volume

Medium Volume Features

Medium volume fixtures generally include spray fixtures that use a moderate water usage. This is accomplished through deluge sprays and output.

Samples include:

Water Domes and Jellyfish

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Water Cannons

Concept – Medium Volume

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High Volume Features

Water features in this category use a significant amount of water for large deluges or water 'dumps'.

Samples include:

Buckets

Concept – High volume

Water usage varies dependent on the features incorporated. Typical usage rates can be as follow:

Water Usage and Flow Volume
- Low Volume – 50 GPM (18,000 GPD)*
- Medium Volume – 75-100 GPM (35,000 GPD)
- High Volume – 130-150 GPM (50,000 GPD)

* GPM – gallons per minute
GPD – gallons per day

The above rates are based on 4 to 6 hours of operation. Although the splash pad will likely be open from 10:00am to 8:00pm (to be confirmed), the actual demand of water is not constant. Many flow though spray pads are designed for a flow rate of about 70 to 150 gallons per minute (GPM) when operating. The largest flow through spray pads can use up to 250 GPM; however this is not recommended.

C. WATER SUPPLY

Water Source

Three (3) potential sources of water supply are considered for the Omemee Splash Pad. These include

- Water wells - new or existing
- Pigeon River - potential raw water source
- Municipal System - currently unavailable

Health codes that govern pools and spray pads require a potable water source. As such, water must be delivered to a potable (drinkable) level. Treatment would be required for the first two options noted above.

The flow only happens when the spray pad is activated by someone touching the activator and setting off a 3-minute sequence before it needs to be reactivated. A re-circulating spray pad only uses water to initially fill the holding tank (typically a 1,500 to 3,000 gallon underground tank) and then water to make up for losses due to evaporation and bather carry off. A 38mm (1½") water service line is recommended to supply a re-circulating spray pad.

Water Wells

Typical water wells in the Omemee area generate a flow rate of about 8 GPM (36 liters per minute). There is a current drilled water well that services the fire station. This has a yield of about 5 GPM. Reports indicated that the ground water exhibits high iron and sulfur levels. Treatment for these minerals as well as any other impurities would be required.

With a projected flow rate of the water well to be approximately 8 gallons per minute (1 cubic foot per minute (CFM)), a storage tank (or series thereof) would be required. The flow rate of 8 GPM is

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not adequate for a direct feed to the splash pad. As such, a reservoir tank would be required, with the well providing a trickle feed to the tank. Subject to the fixture and hence water demand requirements, it may be that several wells would be required as well as sufficient storage capacity to support the water demands of the hottest days in the summer.

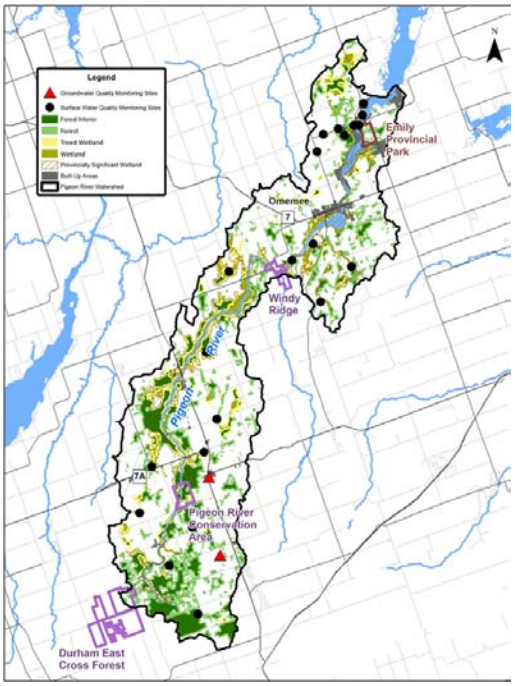
Testing and exploration into the supply of water from wells is required. It is important to ensure that the existing aquifer is not diminished to the detriment of the other users in Omemee.

Additionally, a pumping system (to feed the fixtures) and a water treatment system would be required. As a comparable, the Elgin Park (Lindsay) splash pad used approximately 10,000 cubic meters in 2023 (approximate 2.2M gallons). This is equivalent to about 100m^3 per week. Quantities for 2021 and 2022 are much lower but that is likely due to the COVID-19 restrictions.

A Permit to Take Water may be required from the Conservation Authority.

Pigeon River

An alternate source for water is Pigeon River. This is a non-potable water source. This is a raw water source, naturally occurring in the Pigeon River. The water would have to undergo a treatment process to remove impurities, contaminants, sediment, microorganisms and pollutants. This would require a pumping system and a pre-filtration system to clean the river water. The water would have to be cleaned to a potable, drinkable quality. A Permit to Take Water may be required from the Conservation Authority.



Another consideration that must be addressed is the actual treatment process itself. It is unlikely that the treatment could be completed at rates required for the splash pad. As such, storage tanks, similar to well water, would be required.

Pigeon River is considered a provincially significant wetland, and as such, permission to draw this water would be required from several agencies.

Municipal Water Supply

Municipally treated and distributed water is currently not available in Omemee. As such, this is not a viable source for water for the splash pad.

Water Recycling

Given the limited availability of municipal water at this location, a water recycling system may be considered. This will include a holding tank (see above for water source options) and

filtration/treatment system and a pump. Generally, splash pads with recycling require a separate building to house pumps and treatment equipment.

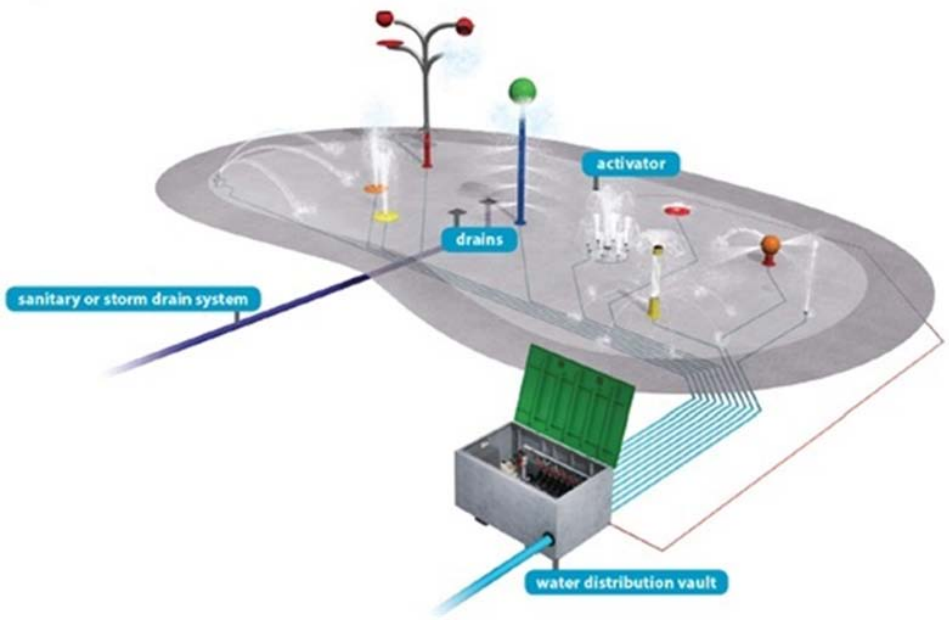
Water discharge

There are several methods to deal with the 'used' water. These include:

- Flow Through System - direct to drain
- Flow Through System - repurpose
- Re-circulating System

Flow through system - direct to drain

There are two local sewers that could be connected. These include storm sewers and sanitary sewers. Alternatively, the water could be discharged directly into the environment (such as overland or into the Pigeon River). This would require a de-chlorination system to clean the water before dumping into a natural watercourse. Both methods would mean 'dumping' all water with only a single use, putting a higher demand on the water source.

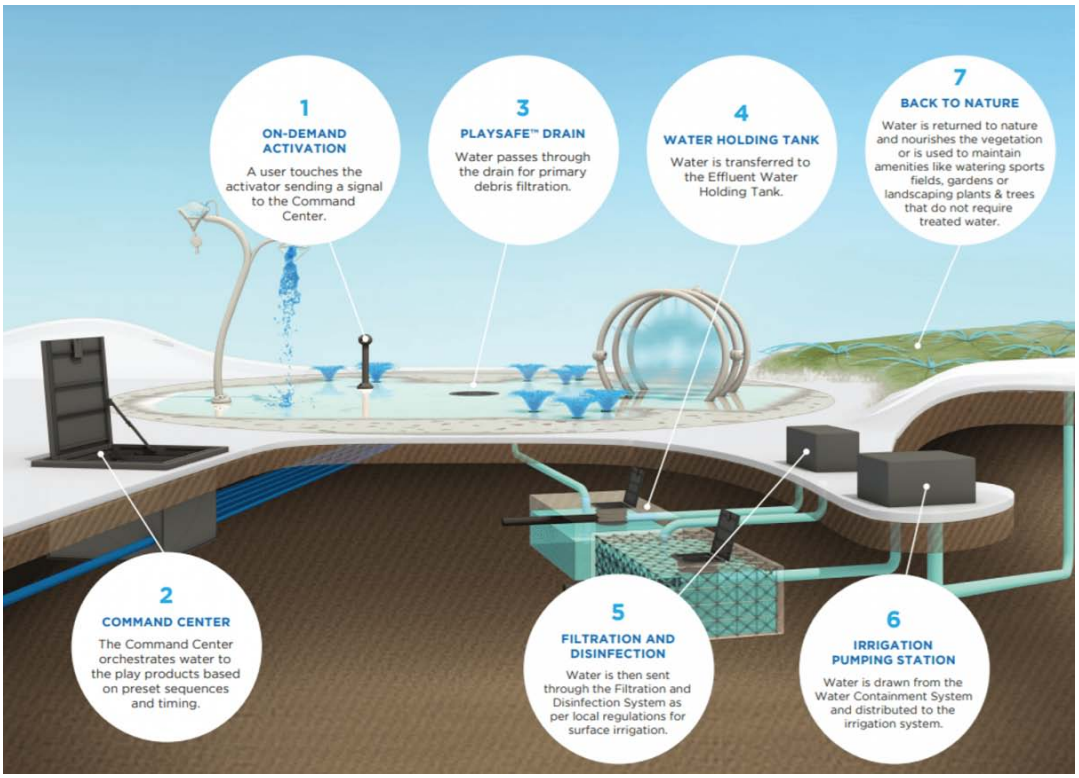


Graphic illustration of 'Direct to Drain' system

Flow through system - repurpose

For this system, the used water will be collected and used for other purposes. This could include storage for irrigation, separate watering systems or possible grey water for washrooms.

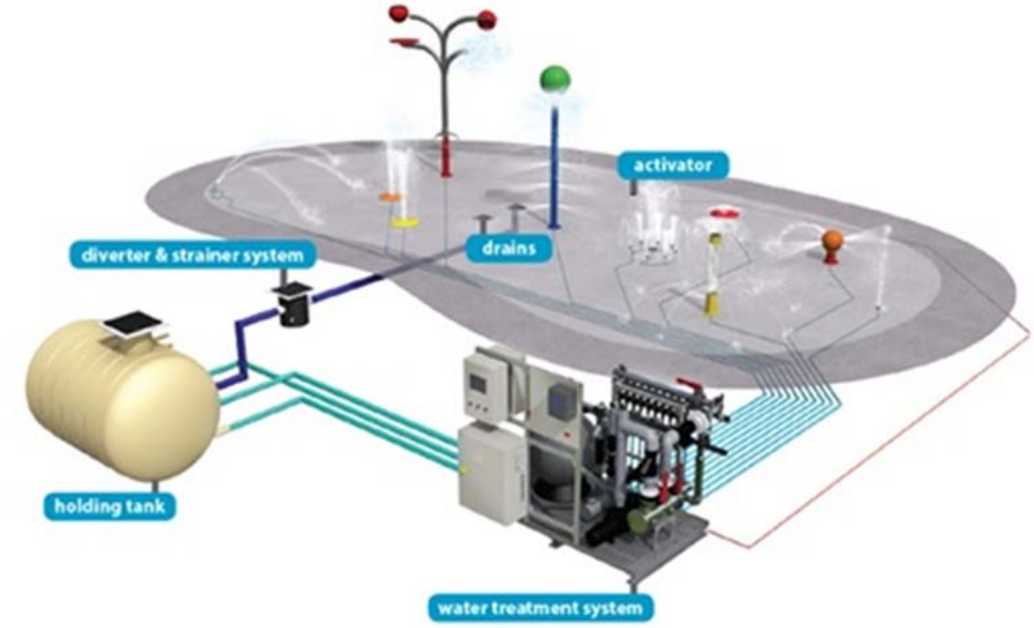
Flow through systems require a constant supply of fresh water.



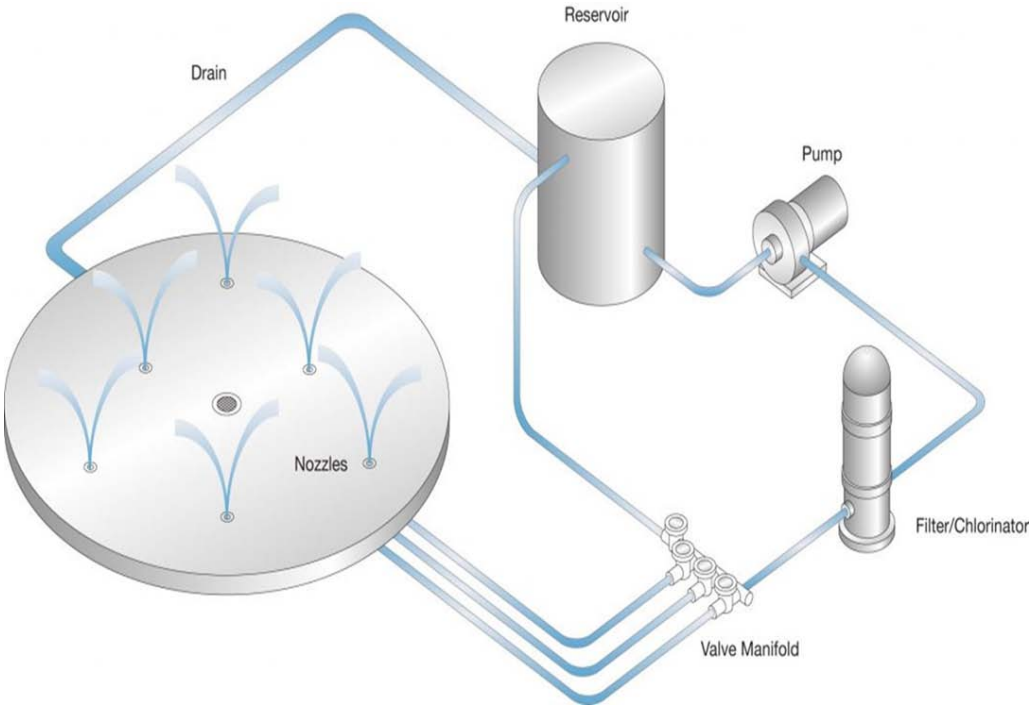
Graphic illustration of 'Direct to Drain - Repurpose' system

Re-circulating System

Water is initially pumped or delivered from a water source such as a well or storage tank to the splash pad features. Instead of being discharged, the water is stored, filtered and treated for reuse in the splash pad. This system requires a high level of testing (similar to a swimming pool) and will likely mandate a full-time staff member on site during the operating hours of the splash pad.



Graphic illustration of Re-circulating system



Graphic illustration of Re-circulating system

D. POWER

A spray pad needs one single phase 30-50A 220-240V circuit. The exact requirement should be confirmed once the design and basic system requirements are established. It can be designed to use single or three phase. At the time of design, the equipment should be selected to match the availability of the power and water onsite. The existing power available at the site is to be confirmed (assumed to be a 100A service at the washroom building). There will be a cost associated with any power upgrade requirements.

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E. PARKING

It is assumed that the existing parking lot would continue to serve this park and the new splash pad. Consideration to upgrade and possibly expand should be anticipated. The splash pad may attract considerable public use, including an increased use of the park and its amenities.

F. OPERATING COSTS

The cost to operate a flow through spray pad can be between $1,500 (if testing system is automated) to $30,000 per year in water costs, depending on the flow rate and overall size of the pad. A re-circulating spray pad has a range of $5,000 to $10,000 for water costs and has a much lower yearly cost to operate as it reuses the water. However, there are higher staffing costs as well as treatment costs for a re-circulating system. This must be factored into the considerations. There is a fair commitment for City staff to operate this facility (estimated to be 900 hours). Outsourcing to a local operator is an option that could be considered.

G. STAFF REQUIREMENTS

For a flow through spray pad staff should stop by once or twice a week to check to make sure everything is operating properly and there hasn't been any vandalism. For a re-circulating spray pad, staff will need to check every day to ensure that it is operating and complete a few tasks like take water samples, record operating parameters, and check that the automated system is doing its job. We believe that most splash pads operated by other municipalities employ a discharge direct to drain. This eliminates much of the treatment and associated staff time but increase the water supply costs. Testing is required every two hours for a re-circulating system.

H. OTHER CONSIDERATIONS

Operating Times

The spray pad can be equipped with a timer that allows it to operate only during set hours. These hours are chosen by the Municipality for the spray pad and prevent it from being activated outside of these hours (for example late at night). Depending on which controller is selected the operator can chose different hours for different days (say week days and weekends) and change them over the season.

Splash pad pads typically run from mid-June to September (Labour Day), approximately 12 to 14 weeks.

Spring Start Up

Commissioning a flow through spray pad in spring requires removing the winterizing nozzle covers on the spray pad features that are flush with the concrete and installing the spray nozzles. Then the water system will need to be turned on, this usually requires reinstalling the water meter that was removed for winter, closing the drain valves located on each of the feature water supply lines and

checking to make sure each feature solenoid valve operates properly. This typically takes an experienced person a half of a day. Commissioning a re-circulating system is a bit more involved and requires everything that is done for a flow through spray pad plus starting up the water treatment equipment. An experienced person typically completes this in 1 day. The fixtures will also have to be reinstalled where they were removed for winter storage.

Winterization

To winterize a flow through spray pad, the water supply is shut off and drained back to a self-draining shut off valve that is below the frost line and the water meter is removed. Then the drains on each of the feature lines are opened to drain any water out of the feature lines. The spray nozzles (flush with the concrete) are then removed and antifreeze is poured into each until it runs out at the drain port. This ensures that no lines will have ice forming in them. The supplied winter caps are installed on these nozzles. Above ground features are not typically removed.

Winterizing a re-circulating spray pad requires the same items as a flow through spray pad but also requires the water treatment system equipment to be fully drained of water, some probes removed and a few other small items completed.

Fixtures can be removed and stored to prevent winter damage or vandalization.

Location

The location of the splash pad within the park requires careful consideration. Given the likely water source is a drilled well, locating the pad closer to the well would reduce water lines and associated costs/maintenance.

Additionally, the lower portion of the park (closer to the river) has a sandy area. Distancing from this sand would be advisable to minimize the tracking of sand into the splash pad. Sand tracked into the splash pad area would require additional filtration to remove this sand.

Careful grading of the site and setting the relative elevation of the splash pad are important to address these issues.

Pathways

Subject to the final splash pad location, pathways will need to be constructed, connecting the various features within the park including washrooms (fire station), parking, river, sand play area, etc.

Other Amenity Improvements

Should the decision be made to proceed with the splash pad, consideration to improving other amenities in the area might be considered. These could include:

- Parking lot
- Beach/river access
- Pathways

- Existing play area.

I. COSTING

There are many factors that need to be considered in the overall capital cost of this project. Final costing can be completed once a design and location has been determined. Some of the factors to be considered include:

- Capital cost of splash pad and features,
- Pump/equipment building,
- Re-circulation system including pumps filters and tanks,
- Possible drilling of new water well(s) for water supply,
- Associated plant to process raw or well water,
- Cost to upgrade power to the site to suit modeling,
- Connection to sanitary sewer (there is a sanitary line on both streets – not recommended) and/or a de-chlorination system to return waste water to the Pigeon River,
- Construction cost for pathway and parking improvements.

A high level cost ranging from $795,000 to $1,035,000 is projected. Refer to Appendix B for detailed breakdown.

Funding sources can vary, but could include the following:

- Municipal funding (requires Council approval)
- Community generated funds
- Grants
- Partnership with local businesses.

J. PERMITS

There are many agencies that require consultation and likely approval through a permitting process. These could include:

- Overview of Haliburton, Kawartha, Pine Ridge District Health Unit (HKPR) requirements governing the use of non-potable and potable water in public recreational facilities:
- HKPR involvement in design and planning highly recommended.
- HKPR inspection required for start-up
- Splash Pad water to be drinking water quality
- Many municipalities with re-circulation systems converting to flow through systems
- Many factors affecting water quality, i.e. water temperature, PH of water
- Adenovirus a concern requires specific contact time with chlorine

The permitting, permissions and consultation process would include:

- Kawartha Region Conservation Authority
- Department of Fisheries and Oceans
- Indigenous Consultation
- Haliburton, Kawartha, Pine Ridge District Health Unit
- City of Kawartha Lakes - Building Department

- Ontario Government - Permit to Take Water
- Ministry of Natural Resources and Forestry

K. RISKS

There are many inherent risks associated with a splash pad in Omemee. These could include:

- Insufficient water supply
- Water quality (must be drinking quality)
- Capital cost
- High operating costs
- Staff demands
- Environmental impact

Potential environmental concerns could include:

- Contaminant in water source
- Disposal of waste/used water
- Pre-treatment for disposed water
- Chemicals in water treatment process
- Raw water intake structure

L. CONCLUSION

There are many considerations to be made in a decision to construct a splash pad at the Omemee Municipal Park. Based primarily on the availability of water (or lack thereof), the following should be considered:

- Concerns related to water provision and capacity to operate the splash pad
- Significant financial investment is required to install the splash pad, whether by the community or municipality.
- Staff support (and associated cost), which would be an increase in service level, will be required to operate the splash pad.
- There is positive community support for a splash pad to be built at Omemee Beach Park.
- Anticipated use (Omemee population is only 800, number and ages of children to be confirmed),
- Pump/treatment building,
- Connection of water source (drilled well or Pigeon River),
- Pre-treatment if well water or river water is used as source,
- Selection of water fixtures that support low water consumption,

Additional considerations may be obtained from stakeholders. Feedback from the community to determine how well the plans for a splash pad align with the community's wants, needs and priorities. How successful the splash pad will be is dependent on this community feedback. When gathering feedback from the community and stakeholders, the following considerations should be made:

- Whether you want to consider eco-friendly solutions
- Whether you want to consider implementing play zones

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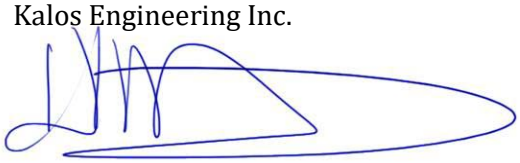
- What impact the splash pad will have on its surroundings
- Whether your splash pad will be targeted to a certain age group

Given the anticipated water demands, a further study into the availability of water to this project is essential. The use of well water or drawing from the Pigeon River, as well as treatment and storage volumes is critical into the viability of a splash pad in Omemee.

We trust that this is acceptable to you and welcome your comments or questions.

Yours very truly,
Kalos Engineering Inc.



Per: Hank A. P. Huitema, M. Eng., P. Eng.
Senior Structural Engineer

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Appendix A
Photographs

Photo 1 – Playground Area (sand)

Photo 2 – Park – looking to fire station

Photo 3 - Play Equipment

Photo 4 – Play Equipment

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Appendix B
Cost Estimate

City of Kawartha Lakes

Omemee Splash Pad - Cost Estimate 28-Mar-24

No.	Item	Cost Estimate Low	Cost Estimate High
1	Concrete Pad	$ 100,000.00	$ 240,000.00
2	Site Works and restoration	$ 110,000.00	$ 110,000.00
3	Electrical Service	$ 35,000.00	$ 35,000.00
4	Utility Building	$ 100,000.00	$ 100,000.00
5	Water well and distribution	$ 25,000.00	$ 25,000.00
6	Intake Stucture (raw water)	$ 75,000.00	$ 75,000.00
7	Treatment (Pre and Post)	$ 100,000.00	$ 100,000.00
8	Water storage tanks	$ 75,000.00	$ 75,000.00
9	Park improvements	$ 150,000.00	$ 250,000.00
10	Engineering, permits	$ 25,000.00	$ 25,000.00
	SUB-TOTAL	**$ 795,000.00**	**$ 1,035,000.00**
Other considerations			
	Testing Allowances		
	General Contingency (15% suggested)		
	Contractor overhead (startup, insurance, bonding etc.)		
	H.S.T.		

Appendix C
Limitations

Limitations

No party other than the Client shall rely on the Consultant's work without the express written consent of the Consultant. The scope of work and related responsibilities are defined in the Conditions of Assignment. Any use which a third party makes of this work, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Decisions made or actions taken as a result of our work shall be the responsibility of the parties directly involved in the decisions or actions. Any third party user of this report specifically denies any right to any claims, whether in contract, tort and/or any other cause of action in law, against the Consultant (including Sub-Consultants, their officers, agents and employees).

The work reflects the Consultant's best judgement in light of the information reviewed by them at the time of preparation. Unless otherwise agreed in writing by Kalos Engineering Inc., it shall not be used to express or imply warranty as to the fitness of the property for a particular purpose. This is not a certification of compliance with past or present regulations. No portion of this report may be used as a separate entity; it is written to be read in its entirety.

This work does not wholly eliminate uncertainty regarding the potential for existing or future costs, hazards or losses in connection with a property. No physical or destructive testing and no design calculations have been performed unless specifically recorded. Conditions existing but not recorded were not apparent given the level of study undertaken. Only conditions actually seen during examination of representative samples can be said to have been appraised and comments on the balance of the conditions are assumptions based upon extrapolation. Kalos Engineering Inc. can perform further investigation on items of concern if so required.

Only the specific information identified has been reviewed. The Consultant is not obligated to identify mistakes or insufficiencies in the information obtained from the various sources or to verify the accuracy of the information.

Kalos Engineering Inc. is not investigating or providing advice about pollutants, contaminants or hazardous materials. The Client and other users of this report expressly deny any right to any claim, including personal injury claims which may arise out of pollutants, contaminants or hazardous materials, including but not limited to asbestos, mould, mildew or other fungus.

Applicable codes and design standards may have undergone revision since the subject property was designed and constructed. As a result design loads (particularly loading from occupancy, snow, wind, rain and seismic loads) and the specific methods of calculating capacity of the system to resist these loads may have changed significantly. Unless specifically included in our scope, no calculations or evaluations have been completed to verify compliance with current building codes and design standards.

Budget figures are our opinion of a probable current dollar value of the work and are provided for approximate budget purposes only. Accurate figures can only be obtained by establishing a scope of work and receiving quotes from suitable contractors.

Time frames given for undertaking work represent our opinion of when to budget for the work. Failure of the item, or the optimum repair/replacement process, may vary from our estimate.