



Splash Parks: Understanding the Risk and Implementing Better Practice

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CIPHI Annual Education Conference

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A little about me


- Environmental Health Officer
- Interior Health Authority
- Seconded to the NCCEH
 - February to July 2017



Photo Credit: <https://www.hellobc.com/vernon.aspx>



Outline

- Why did we address this topic?
 - (Brief) Overview of Splash Pads
 - Evidence of Risk
 - Risk Factors
 - Best Practices
 - Questions
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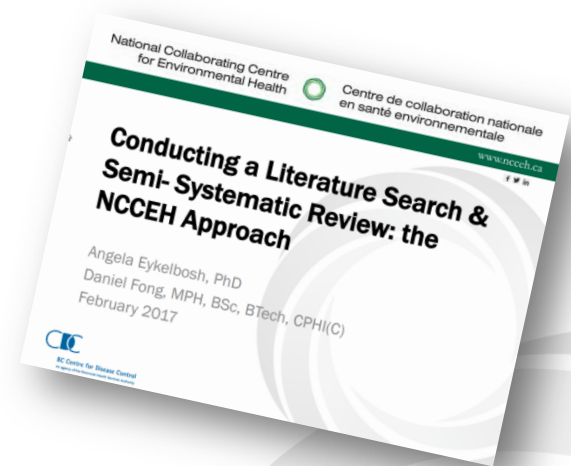
Why Did we Address this Topic

- NCCEH request from Ontario
- Lack of guidance for Canadian jurisdictions
- Evidence Review
 - Chris Russell & Angela Eykelbosh
- Published August 2017
 - www.ncceh.ca



Evidence Review Process

- Systematic Literature Review
 - Literature Search
 - Critical Appraisal
 - Synthesis (New Knowledge)
- Review by requestor
- External Review Process



Conducting a Literature Search & Semi- Systematic Review: the NCCEH Approach

http://www.ncceh.ca/sites/default/files/Conducting_Semi_Systematic_Review_NCCEH_Approach-Eykelbosh-Fong.pdf

Overview of Splash Pads

- Many names
 - Spray park, wet deck, etc.
- Water does not accumulate
- Increasing popularity
 - Less supervision than wading pool
- Variable regulation in North America

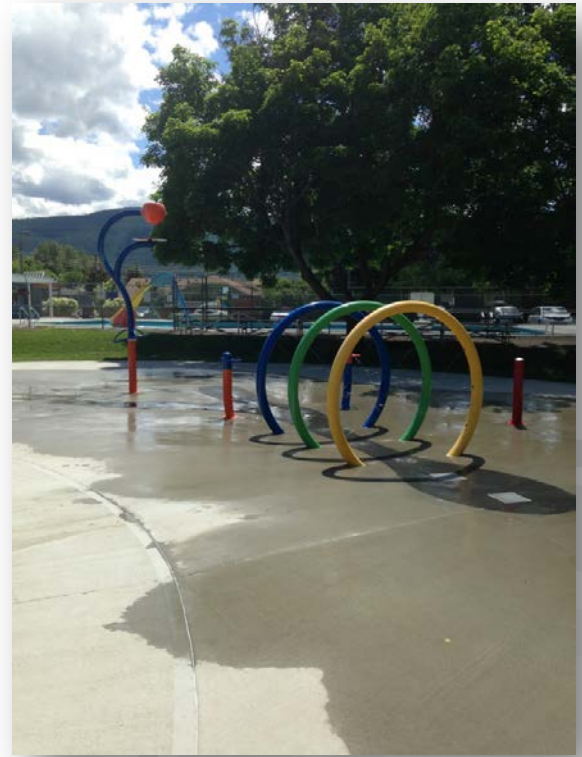
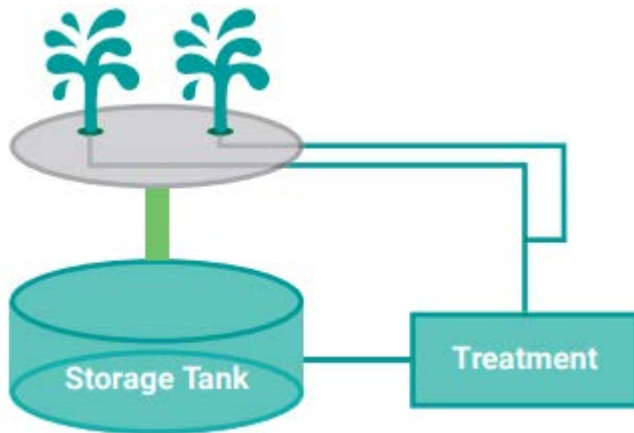


Photo Credit: C. Russell

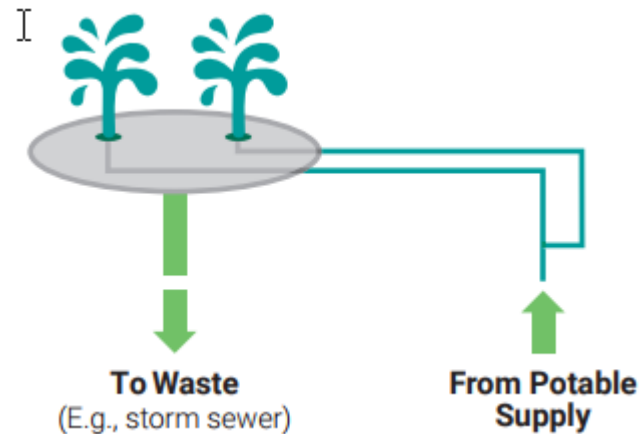
Overview of Splash Pads

Recirculating



Higher Risk

Non-recirculating



Lower Risk

- Design often not indicated (to public)
- This presentation focused on recirculating splash pads

Evidence of public health risk

- **Cryptosporidium**
 - Well represented in outbreaks
 - Chlorine resistance
 - Requires additional treatment (e.g. UV)
 - Most common in treated recreational venues
- **Other Enteric Pathogens**
 - *E. coli*
 - *Salmonella*
 - *Giardia*
 - *Shigella*



Photo Credit:

<http://www.barfblog.com/tags/splash-park/>

Evidence of public health risk

- Legionella
 - Some spray features aerosolize water
 - No cases associated with splash parks
 - Cases associated with decorative fountains
- Physical Injury
 - Scrapes from falls
 - Could not find any data on head injuries



Photo Credit:

https://www.bookmyevent.com/images/JustChill_Images/rainbow.jpg

Evidence of public health risk

Location	Agent	Number Affected	Contributing Factor
Florida (1999)	<i>Cryptosporidium</i> ; <i>Shigella soni</i>	38	No filtration and inadequate chlorine residual
Florida (2006)	<i>Cryptosporidium</i> ; <i>Giardia</i>	49	Inadequate chlorination and other operational deficiencies
Illinois (2001)	<i>Cryptosporidium</i>	358	Park was found to be in compliance with operational requirements. Chlorination only
Kelowna (2004)	<i>Escherichia coli</i>	10	Improper construction of waste water discharge
New York (2005)	<i>Cryptosporidium</i>	~4000	Chlorination only
Idaho (2007)	<i>Cryptosporidium</i>	12	Chlorination only
Ontario (2013)	<i>Cryptosporidium</i>	12	UV light was out of service at time of suspected exposure

Splash Pad Risk Factors

- Behaviour of users
- Open to animals, birds, dust
- Large bather load in relation to volume
- Reduced turnover rates
- Areas that are constantly damp
- Foggers and misters



Photo Credit:

<http://www.waterandhealth.org/parent-maintain-fun-decrease-risks-water-parks/>

Best Practices: Design

- Proper siting of the pad
- Exclusion of animals
- Adequately sized reservoir
- Provisions for constant recirculation
- Discharge of water when not in use
- Ability to drain the deck directly to waste



Photo Credit: <http://wickermemorialpark.com/your-park/splash-pad/>

Best Practices: Design

- Chlorination at least 2.0 ppm
- Second form of disinfection (e.g. UV)
- Foggers and misters from potable supply

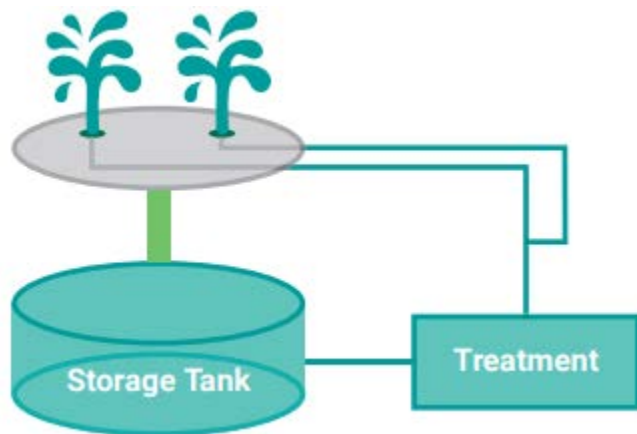


Photo Credit: C. Russell

Best Practices: Design

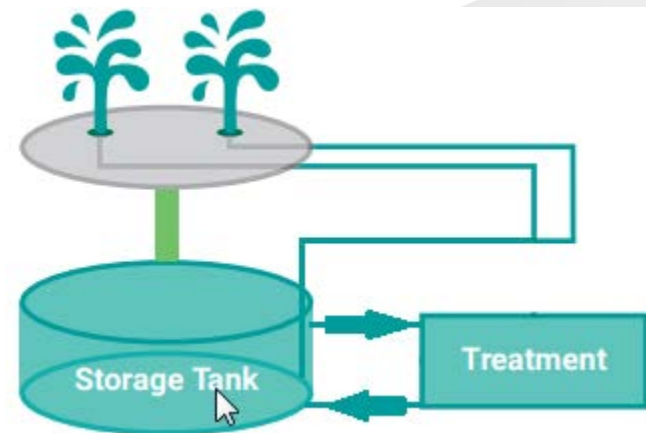
Full Flow Filtration

- Features and filters in series
- 100% of water from filters
- Can be costly




Partial Filtration

- Reservoir treated
- Separate pump feeds features
- Feature pump must not exceed 3X treatment pump
- Turbidity <3NTU



Best Practices: Operation

- Flushing pad surface prior to operation
 - Daily
 - Should be direct-to-waste
 - Inspections
 - Glass
 - Feces
 - Regular sanitation
 - Deck
 - Feature
 - No Quats (DBPs)
- 

Best Practices: Education

- Washrooms
- Diaper change stations
- Footbaths
- Signage
- Supervision



Photo Credit: C. Russell

Best Practices: Education

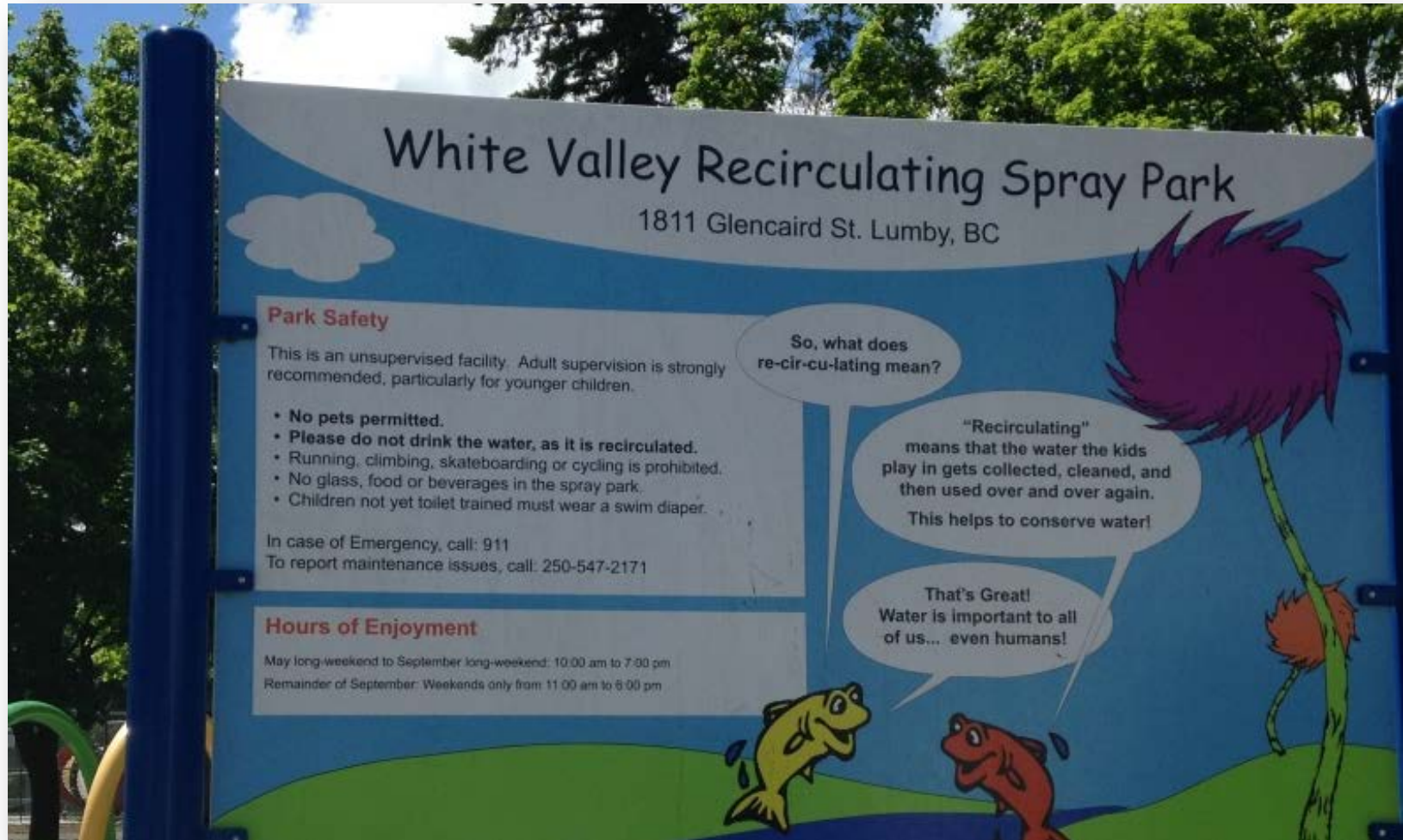


Photo Credit: C. Russell

Ongoing Work

Request sanitizeability assessment of Foam Decking

- Questions about surface
- Question about seams
- Rapid lit search (Summer 2017)
- BCIT student research project (2018)



Photo Credit:

<https://mrcrec.com/www/download/8.181>



THANK YOU!

For more information,
please visit the **NCCEH**
Recreational Water Topic
Page, or reach out!

www.ncceh.ca || www.ccnse.ca

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Photo Credit: C. Russell



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