DUNDALK LAGOON:

2024 EMERGENCY DISCHARGE EVENT

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DUNDALK LAGOON - BACKGROUND

Dundalk lagoon – Site plan

- The **Dundalk** WWTP is a **continuous discharge lagoon system:**
  - Four facultative treatment cells,
  - One post aeration cell, and
  - Tertiary media filter
- **Alum** addition (**dual point**):
  - raw influent
  - prior to tertiary filtration.
- **Nominal design: 1,832 m3/d**
- Services a **population** of approximately **2,803 people**
- **Effluent** discharges to **Foley Drain** (tributary of the **Grand River**)

EMERGENCY DISCHARGE EVENT - INITIATION


Cell #1

- EDE was initiated on April 12, 2024, prompted by alarmingly **high-water levels** across all Lagoon Cells, coupled with an inability to discharge due to **effluent not meeting** prescribed **limits** stipulated in the **ECA** for:
  - **Un-ionized ammonia (UIA),** Objective: 0.05 mg/L, Limit: 0.1 mg/L (single sample result)
  - **Total suspended solids (TSS)** Objective: 5 mg/L, Limit 10 mg/L
- Observations on April 18, at 11:30 AM, revealed an **overflow of raw sewage** from the Cell 1 inlet structure.
- To **reduce/eliminate** this **overflow** and mitigate the risks of berm breaching or structural compromise on the lagoons, **discharge from Cell 4 commenced on April 19.**
- By April 23, the **spill** had **stopped**, with an estimated spill volume of 1,294m3

EMERGENCY DISCHARGE EVENT - (CONTINUED)


Cell #2 Northwest corner

- **Persistently high-water levels** justified the **continued discharge** from Cell 4 until April 26, resulting in an estimated total volume of 23,949m3, **bypassing Cell 5 and the filtration system**.
- In the beginning of May, consultations with OCWA, GRCA, and WaterIQ Technologies yielded the idea of deploying an **ultrasonic device** in Cell 4 to mitigate algae growth, thereby modulating pH, implemented on May 3.
- Concurrently, a subsequent **application of alum** in Cells 3 and 4 demonstrated promising results, with effluent parameters showing a favorable trend towards compliance.

EMERGENCY DISCHARGE EVENT - ENDING

Effluent discharge to Foley drain

- Upon ending the EDE, **normal operations resumed** at the Dundalk WWTF, with effluent parameters consistently meeting the ECA requirements.
- The **EDE concluded** on May 29, due to concerns regarding reduced effluent receiver flows and higher ambient temperatures
- Duration of EDE: 41 days
- A total volume of 144,456m3 was discharged, inclusive of the 23,949m3 from Cell 4

EMERGENCY DISCHARGE EVENT – LESSONS LEARNED

Dundalk lagoon aerial photo (Apr. 30, 2024 (Triton Engineering)

- The Township and Triton Engineering have developed **a mitigation plan** including **enhanced monitoring** and **reporting** to the MECP, to ensure that:
  - Water levels do not reach dangerous elevations, and
  - There is sufficient time for action (i.e., chemical dosing).

DUNDALK LAGOON – PROPOSED UPGRADES

- Installation of a **new influent sewage pumping** to manage increased flows effectively. Additionally, enhancements such as the incorporation of **additional aeration and a floating cover in the final cell** of the lagoons will aid in algae removal, thus improving overall treatment efficiency.
- A major component of this project is the construction of a 22m x 5.5m concrete tank utilizing advanced **Moving Bed Biofilm Reactor** technology, which will optimize ammonia reduction.
- Upgrading the tertiary media filter to a state-of-the-art **disk filter** system will ensure effective removal of Total Suspended Solids.
- Finally, implementing a new **Ultraviolet (UV) disinfection** system will play a critical role in reducing E.coli levels, thereby enhancing the quality of treated wastewater.
- This expansion is expected to **increase the treatment capacity** of the facility by over **65%**, from 1,832m3/day to 3,025m3/day.

THANK YOU!