Stage 3 Liquid Waste Management Plan (LWMP)

TACPAC Meeting #13

June 16, 2025

Please Note: Workshop will be recorded and posted to the CVRD website

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The Comox Valley Regional District respectfully acknowledges the land on which we gather is on the unceded traditional territory of the K’ómoks First Nation, the traditional keepers of this land.

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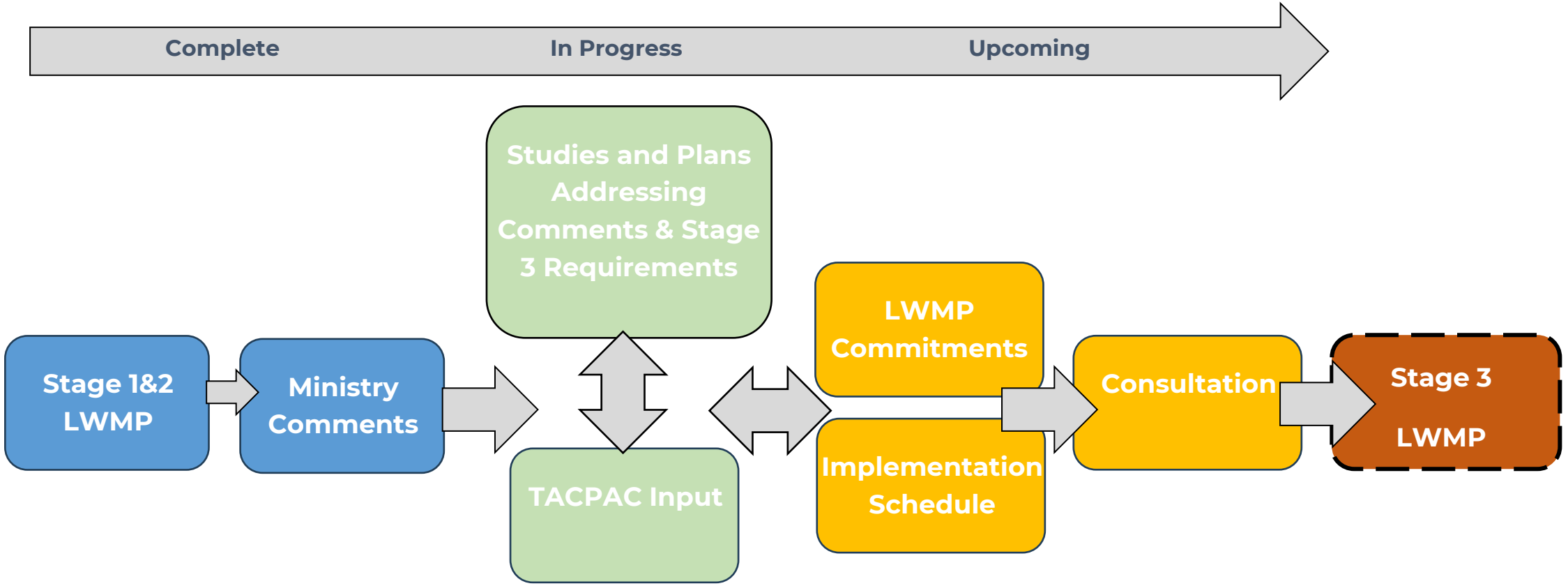
Agenda

1. Review of Meeting Minutes
2. Update on LWMP Process and Work Underway
3. Review of Draft Site Master Plan
4. Review of Source Control
5. Update on Outfall Path Forward
6. Sewer Extension South Update
7. Next Steps and TACPAC Engagement

Update on LWMP Process and Stage 3 Work Underway

Focus and Roadmap for Stage 3 LWMP



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Ministry Requirements for Stage 3 Report

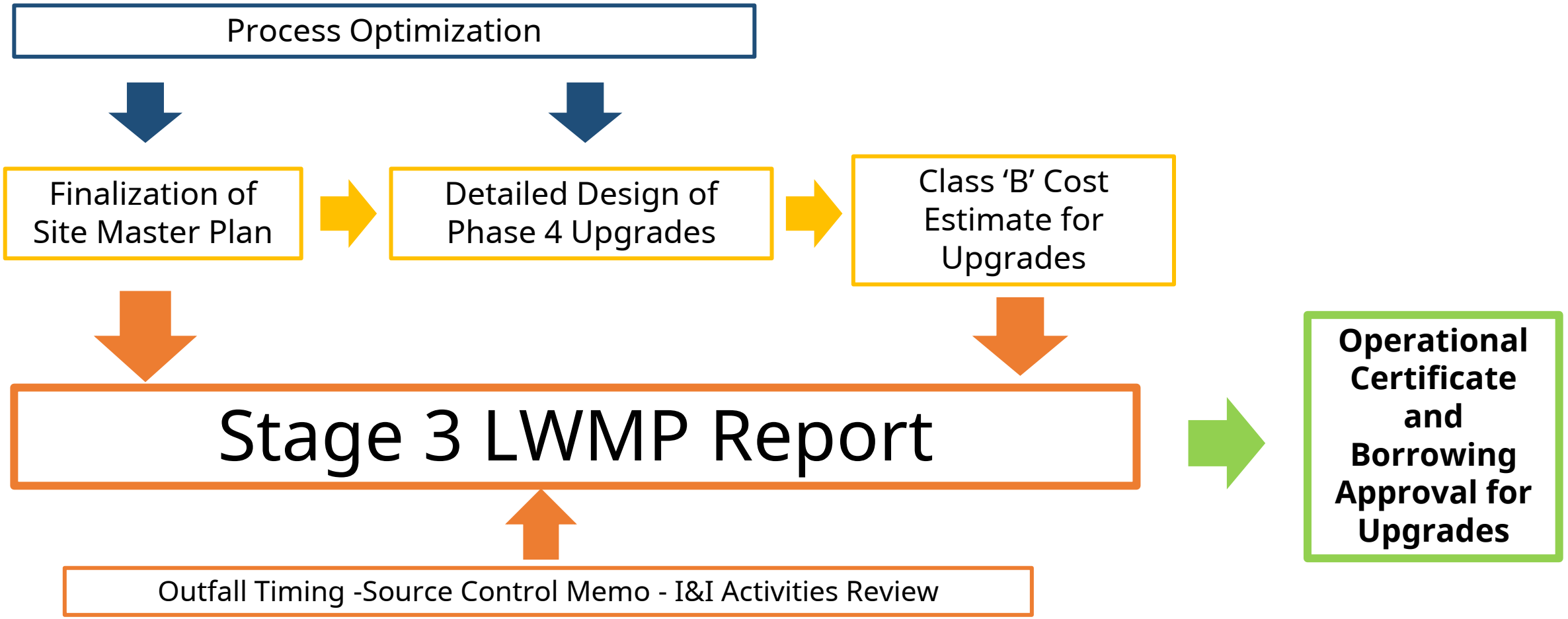
- Site master plan (executive summary)
- Outfall planning component
- Source control planning

Work to be presented and discussed today

- Site master plan (full draft)
- Inflow and infiltration planning
- Resource recovery recommendations
- Environmental impact study
- Phase 4 Upgrade class ‘B’ cost estimate
- Cost impacts to users
- Establishment of plan monitoring committee

Work to be presented and discussed at future TACPAC meeting

Path to Stage 3 LWMP Report Submittal



Process Optimization

- Population servicing capacity of **existing** infrastructure can greatly vary depending on process
- CVRD operations staff have been working closely with process expert on
  - Stress testing of existing tankage
  - Additional laboratory analysis and sampling program
  - Trialing different chemical additions in collection system
  - Development of bioreactor pilot study
- Work with process expert is reflected in the draft site master plan being presented today

Site Master Plan and Detailed Design
Carollo

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Site Master Plan Update & Phase 4 Detailed Design

Comox Valley Water Pollution Control Centre (CVPCC) Site Master Plan

June 16,2025

Presentation Outline

Provide overview of the Site Master Plan findings:

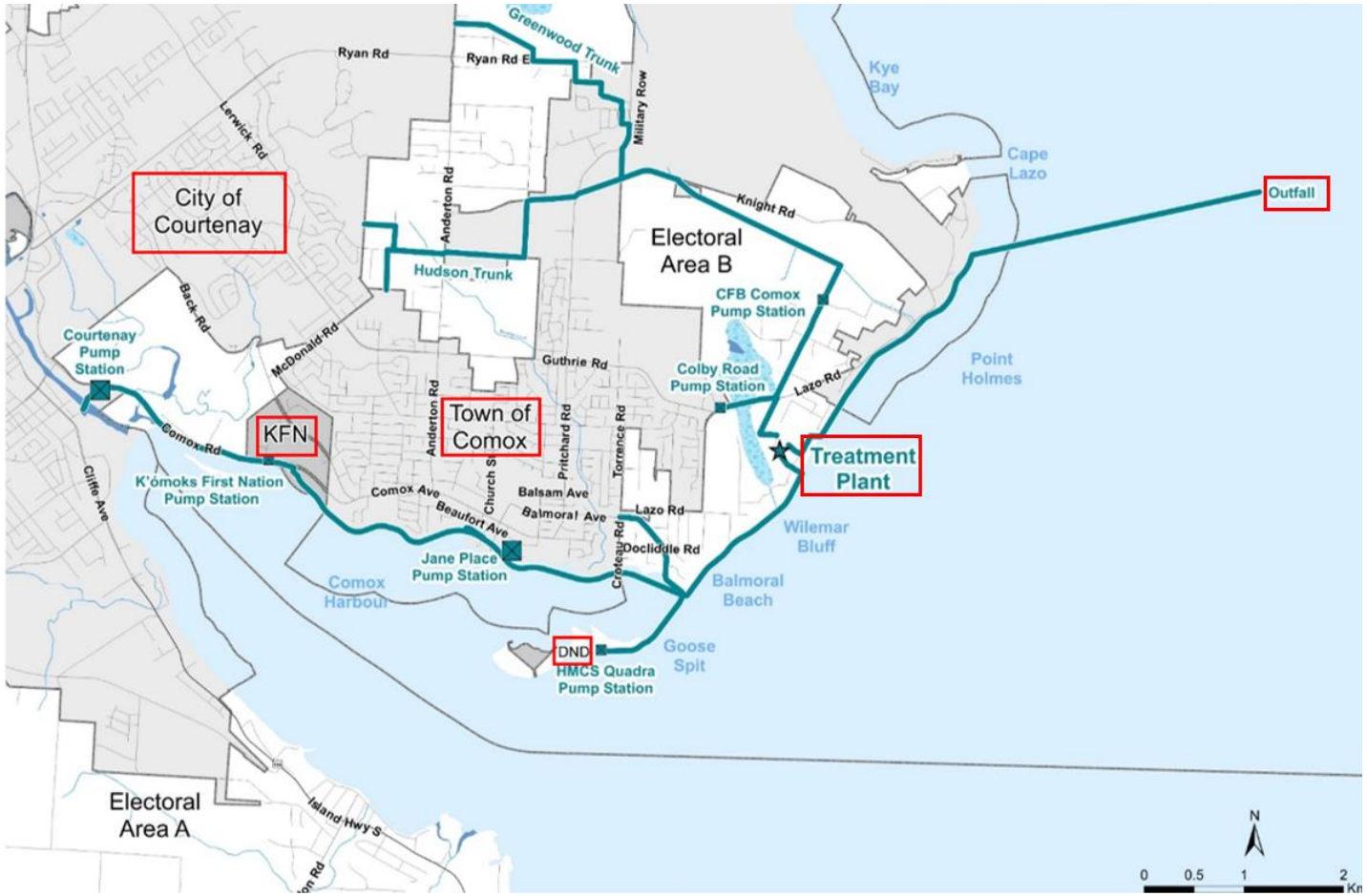
1. Context and facility background
2. Revised service population projections
3. Wet weather management and mainstream treatment upgrades
4. Solids treatment upgrades
5. Resource recovery
6. Proposed staging plan

1

Context and facility background

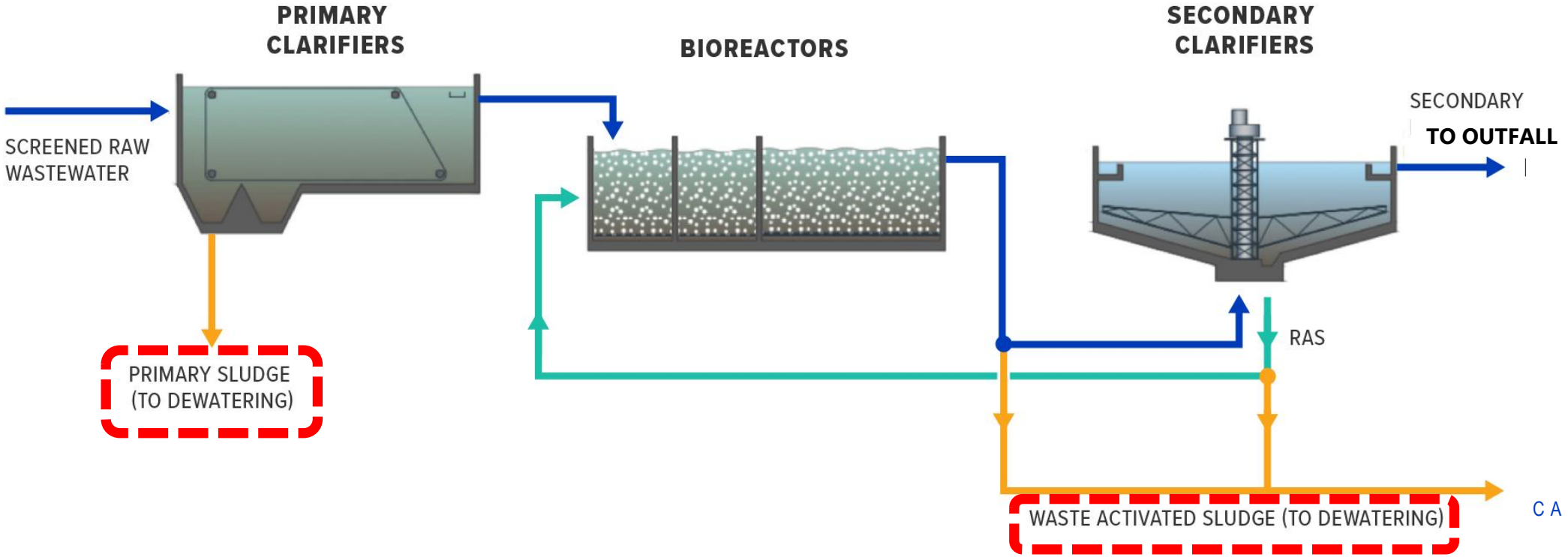
Introduction

- Comox Valley Water Pollution Control Centre (CVWPCC) is a wastewater treatment plant operated by CVRD
- Services
  - City of Courtenay
  - Town of Comox
  - K'ómoks First Nation (KFN)
  - CVRD unicorporated areas
  - Department of National Defence (CFB and HMCS Quadra)
- Treated effluent is discharged to the Salish Sea via a submerged outfall



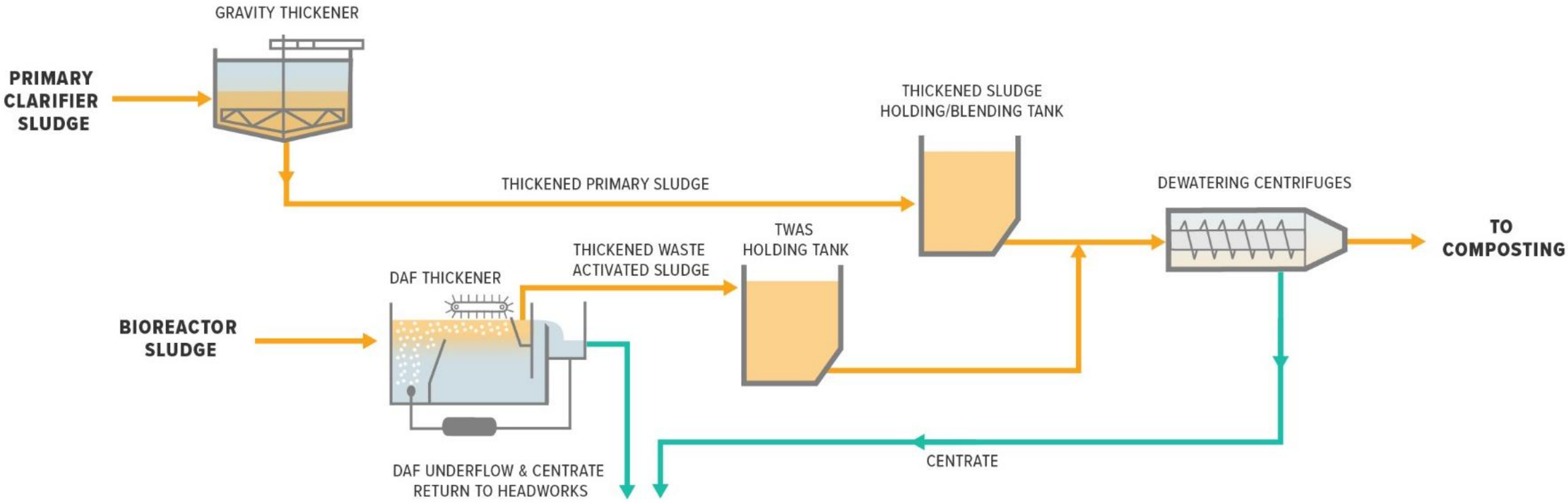
Introduction

- Secondary treatment removes biological oxygen demand (BOD) and total suspended solids (TSS)
- BOD and TSS negatively impact receiving waters by depleting oxygen resulting in fish mortality
- A large fraction of the TSS is settled in the primary clarifiers
- Any colloidal or dissolved constituents are biodegraded in the bioreactor
- Sludge from primary clarifiers and biological growth managed by another set of processes



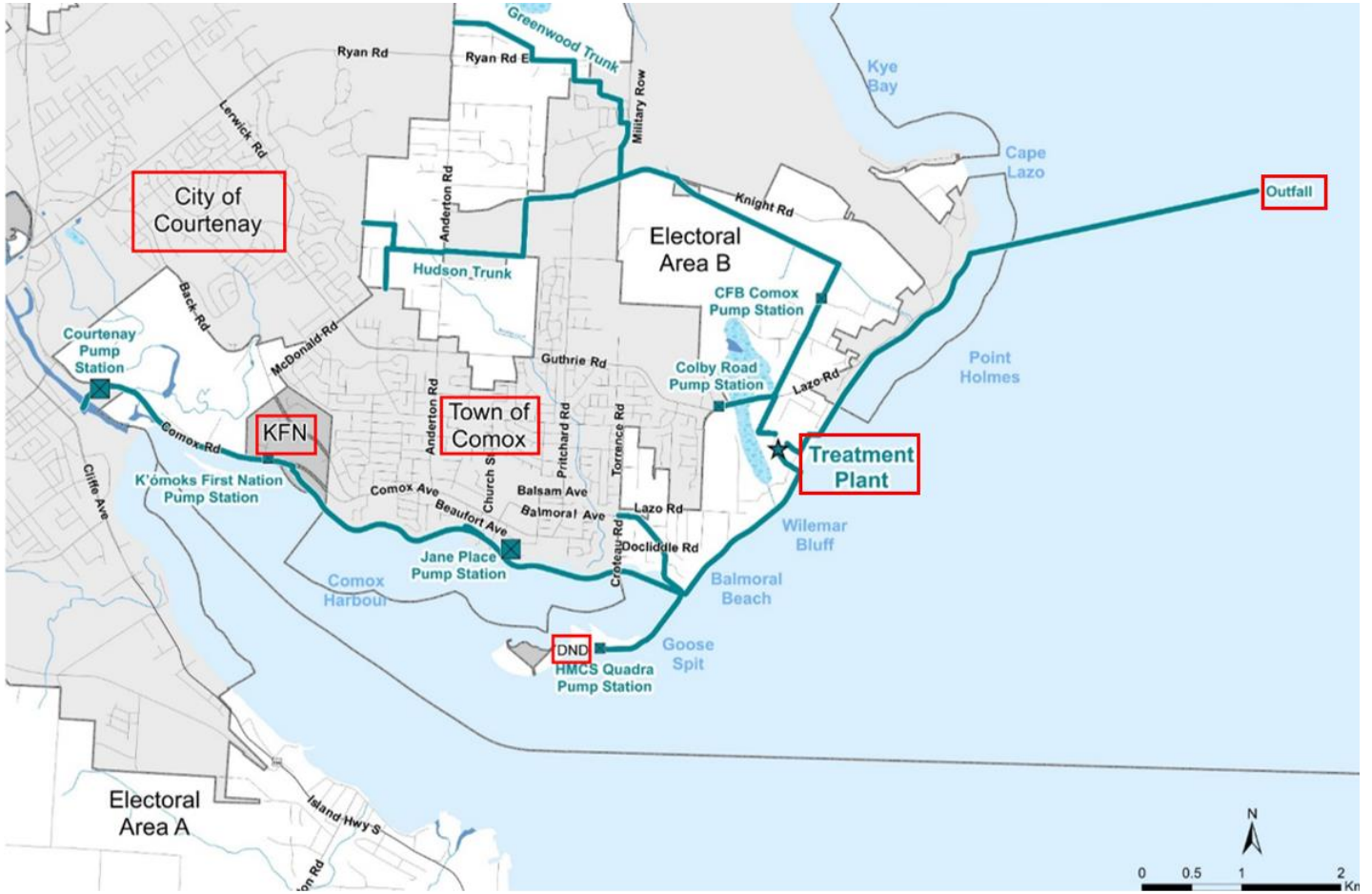
Introduction

- Residual sludges are thickened, dewatered and then composted
- Sludges are the bi-product of treatment and need an unimpeded outlet for reuse



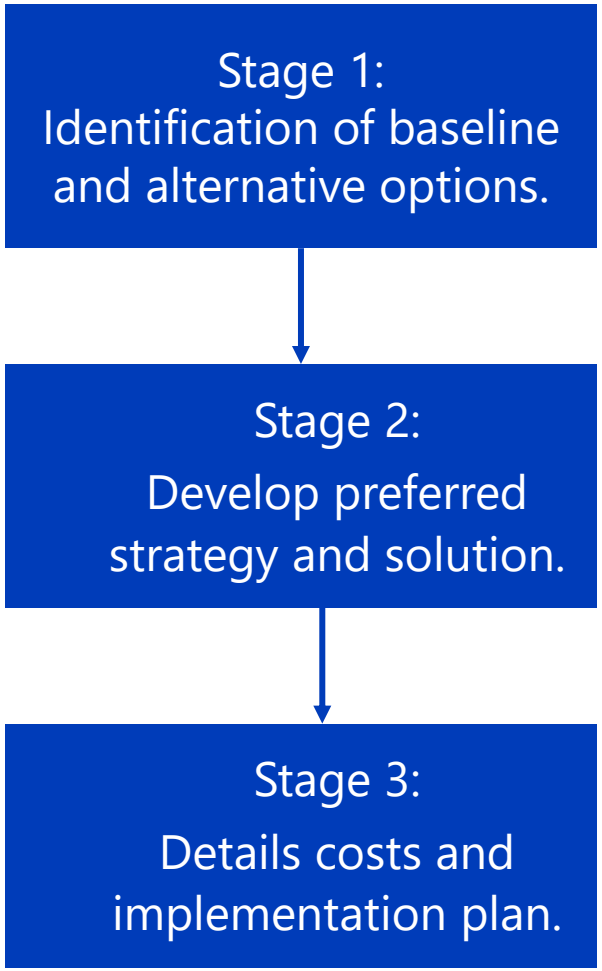
Introduction

- The CVWPCC upgrade is being guided by a Liquid Waste Management Plan (LWMP)
- LWMP functions as a regulatory document under the *Environmental Management Act* and together with the *Municipal Wastewater Regulation (MWR)*



Introduction - Liquid Waste Management Plan (LWMP)

- LWMPs are a 3-stage process guided by technical and public advisory committees and public engagement.
- CVRD initiated the LWMP process in 2018 and completed Stage 1 and Stage 2 reporting.
- The site master plan was commissioned to develop upgrade staging and costs through to 2060.



Introduction - Site Master Plan Objectives

- Revise service population projections and design criteria
- Develop cost-effective, resilient infrastructure strategies and maximize reuse of existing infrastructure
- Identify capacity bottlenecks and end-of-life equipment
- Establish timing of upgrades based on goals recommended in LWMP
- Estimate cost and scope of upgrade phasing

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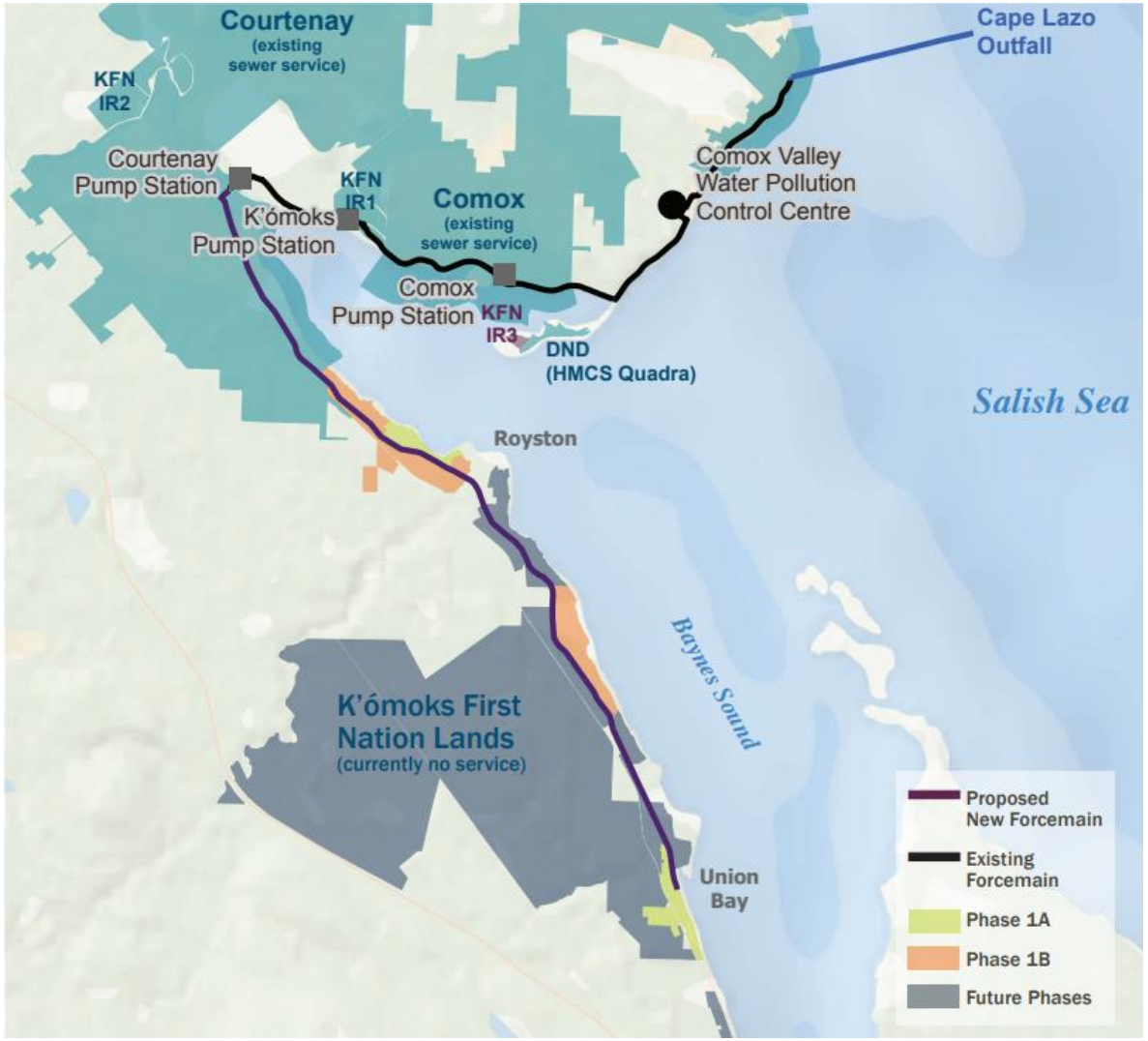
Revised Service Population Review & Design Criteria

Revised Service Population Projections

- Ensuring treatment capacity exists to meet service population projections is a key objective of the Plan
- Population growth will occur through:
  - Organic growth within existing sewer area
  - Infill densification motivated by new provincial regs. (Bill 44)
  - South sewer extension (Royston, Union Bay, KFN)

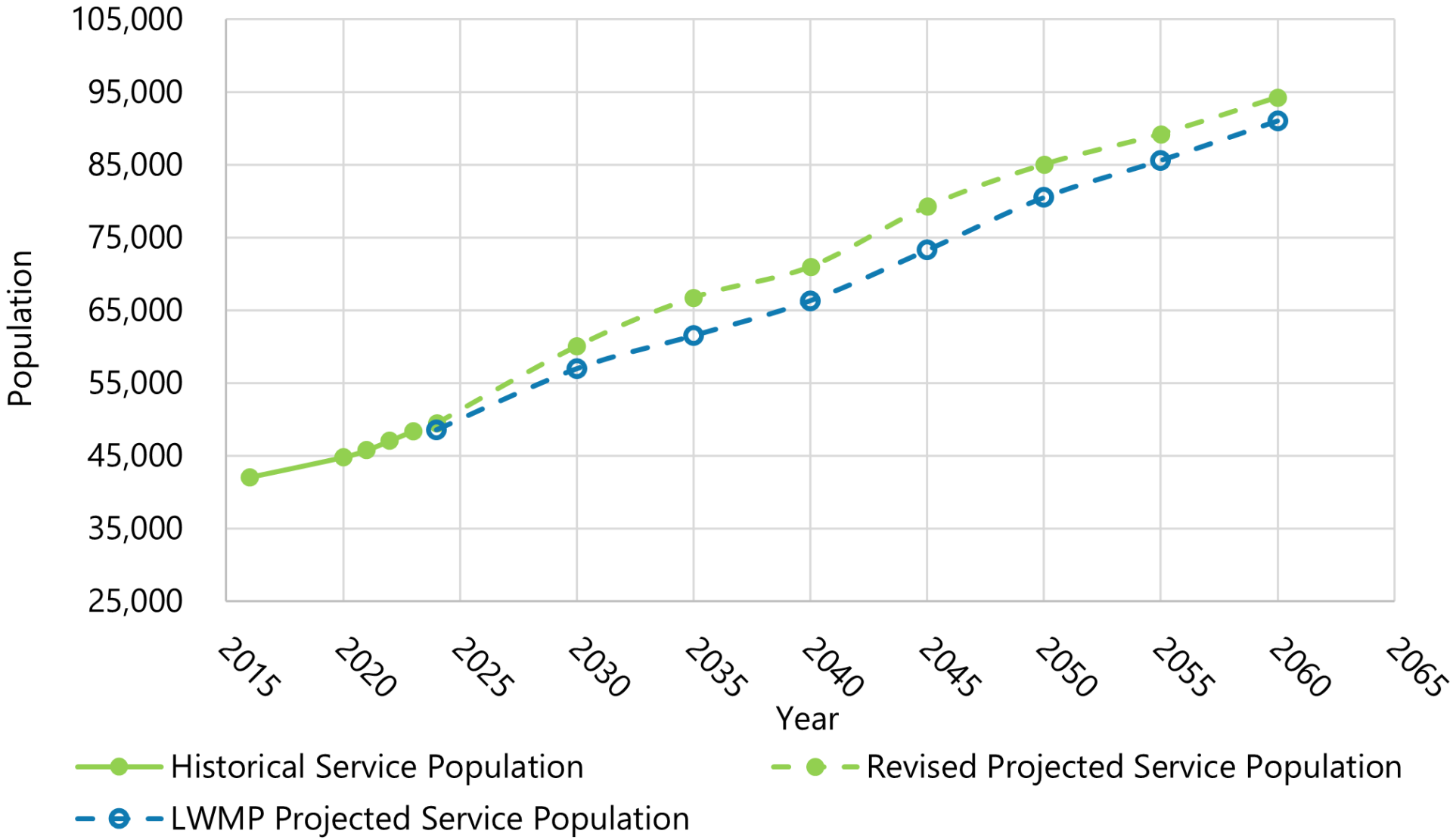


Revised Service Population Projections

- Population projections updated to incorporate Housing Needs Assessment – an outcome of Bill 44
- The revised projections serve as the basis for calculating wastewater loading and informs planning and design of future facility upgrades

Year	Comox	City of Courtenay	CFB Comox	KFN	South Sewer Service	Total
Historical Population						
2016	14,485	26,585	966	-	-	42,036
2021	15,305	29,200	966	291	-	45,762
2022	15,603	30,220	966	295	-	47,083
2023	15,900	31,240	966	299	-	48,405
Projected Population						
2024	16,163	32,040	966	303	-	49,472
2030	17,689	36,628	966	327	4,460	60,070
2035	19,740	40,260	966	349	5,473	66,788
2040	20,270	42,920	966	372	6,489	71,017
2045	21,995	46,525	966	397	9,396	79,279
2050	22,920	48,470	966	423	12,305	85,084
2055	24,245	50,825	966	451	12,787	89,274
2060	25,570	54,020	966	482	13,270	94,308

Revised Service Population Projections



Revised Service Population Projections

	Unit	2024	2030	2035	2040	2045	2050	2055	2060
Service Population Projection		49,471	60,070	66,788	71,017	79,279	85,084	89,274	94,308
5-day Biological Oxygen Demand (BOD_5) Loading									
Average Annual	kg/day	3,859	4,685	5,209	5,539	6,184	6,637	6,963	7,356
Maximum Month	kg/day	5,016	6,091	6,772	7,201	8,039	8,628	9,052	9,563
Total Suspended Solids (TSS) Loading									
Average Annual	kg/day	4,007	4,866	5,410	5,752	6,422	6,892	7,231	7,639
Maximum Month	kg/day	6,131	7,444	8,277	8,801	9,825	10,544	11,064	11,688
Wastewater Flow									
Average Dry Weather Flow	m^3/d	12,368	15,017	16,697	17,754	19,820	21,271	22,319	23,577
Average Wet Weather Flow/ Average Day Flow	m^3/d	16,184	19,651	21,849	23,233	25,935	27,835	29,205	30,852
Maximum Month Flow	m^3/d	24,735	30,034	33,392	35,507	39,638	42,540	44,635	47,152
Maximum Day Flow	m^3/d	40,048	48,628	54,066	57,490	64,178	68,878	72,270	76,344
Peak Hour Flow	m^3/d	50,724	61,591	68,479	72,815	81,286	87,239	91,535	96,696
Maximum Instantaneous Flow	m^3/d	55,888	67,862	75,451	80,229	89,562	96,120	100,854	106,540

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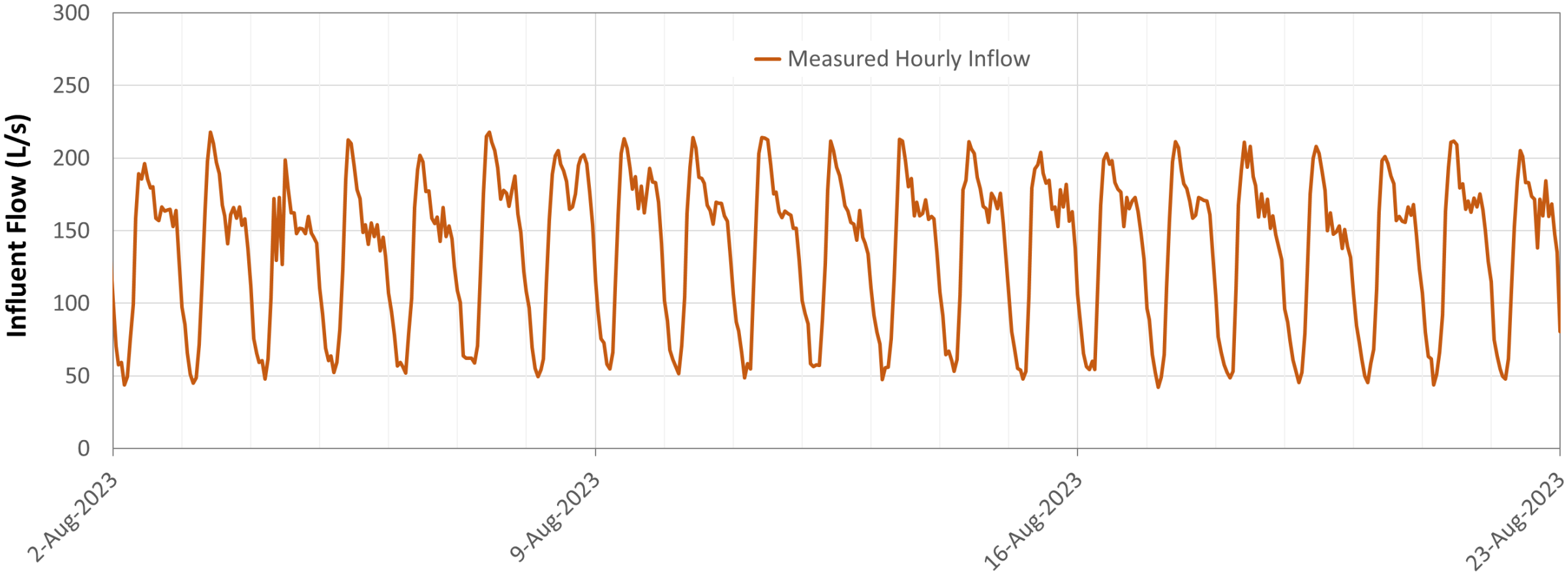
Wet Weather Management & Mainstream Treatment Upgrades

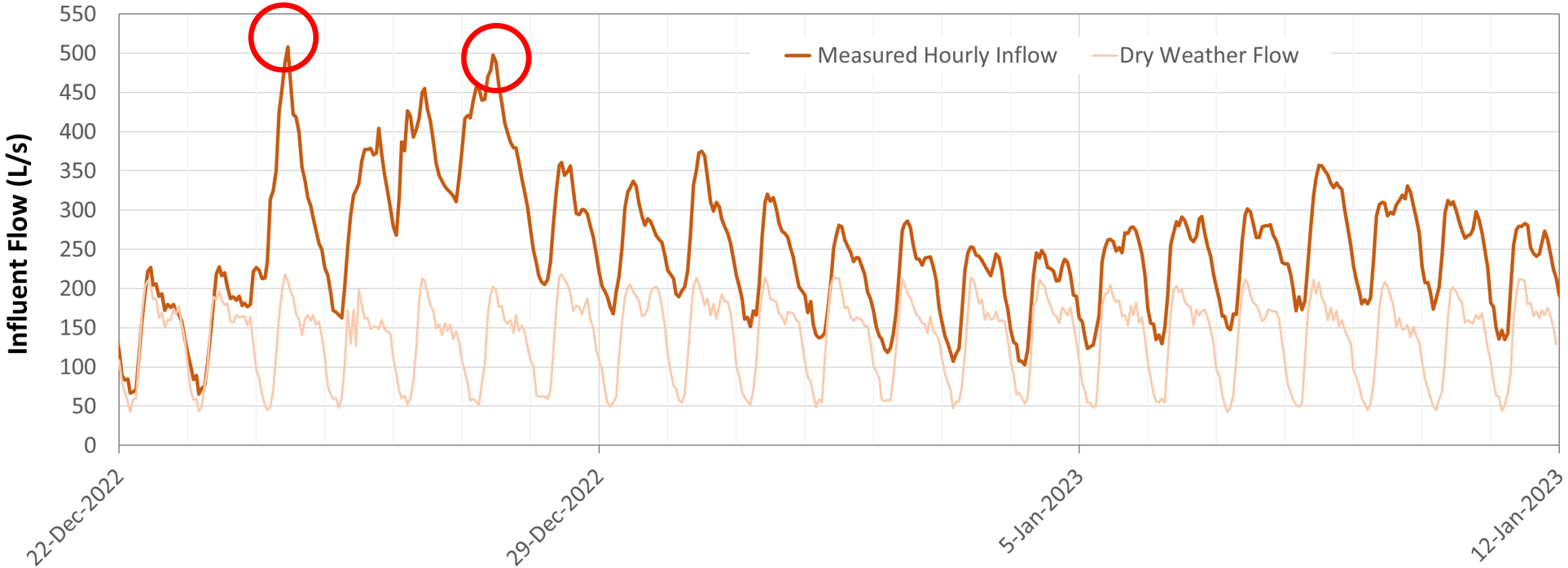
Wet Weather Treatment – Problem Definition

- During dry weather, wastewater flow to the CVWPCC has a predictable pattern
- The average dry weather flow (ADWF) is a reference



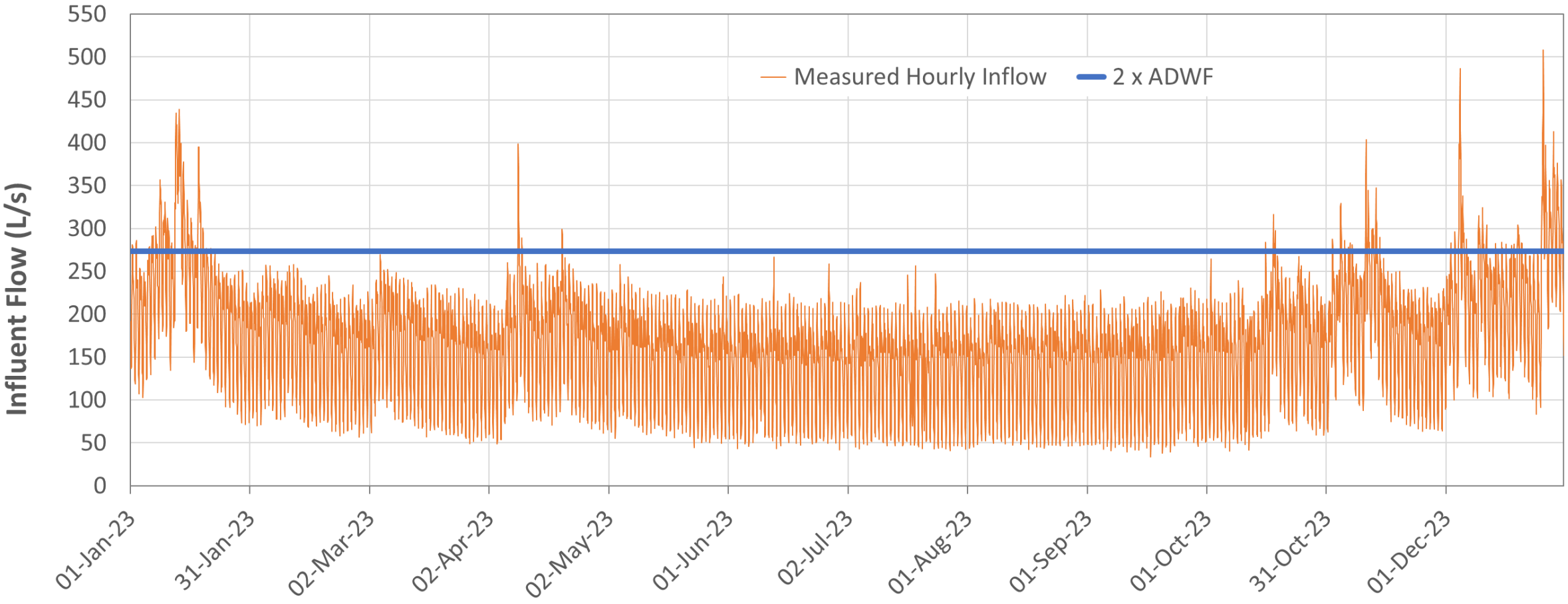
Wet Weather Treatment – Problem Definition

- Rainwater or snowmelt leaks into the CVWPCC collection system
- Inflow and infiltration (I&I) increases flow/variability & dilutes wastewater
- CVWPCC hourly flow can increase more than 4-fold compared to ADWF



Wet Weather Treatment – Problem Definition

- The Municipal Wastewater Regulation defines wet weather flow as anything more than 2 times ADWF (2xADWF) – <u>most inflow is below this threshold</u>
- For CVWPCC, wet weather inflow associated with rain events and is seasonal



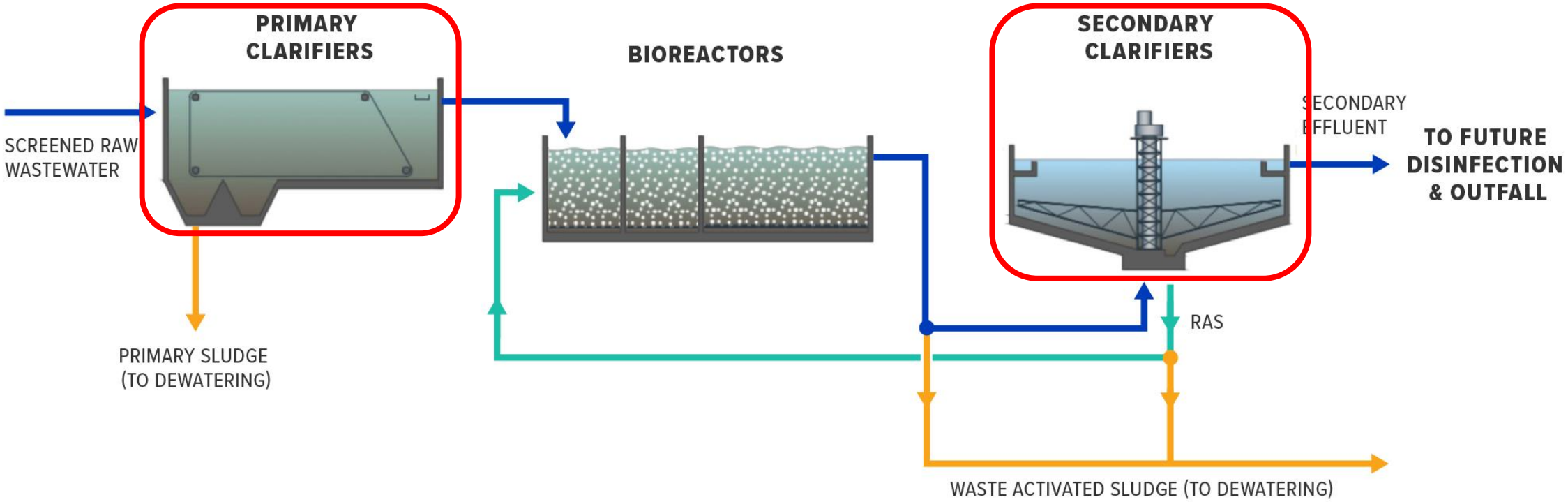
Wet Weather Treatment – Problem Definition

- Wet weather as a fraction of the total wastewater volume is relatively small
- Historically, less than 2.5% of annual inflow volume meets the wet weather criterion of 2xADWF

Year	Average Dry Weather Flow (m^3/day)	Total Annual Volume Greater Than 2xADWF (m^3)	Total Annual Wastewater Volume (m^3)	% of Total Volume
2020	11,656	109,720	5,115,646	2.1%
2021	11,893	133,459	5,509,521	2.4%
2022	11,788	105,257	5,258,391	2.0%
2023	11,810	71,936	5,254,642	1.4%
2024	12,368	130,019	5,638,930	2.3%

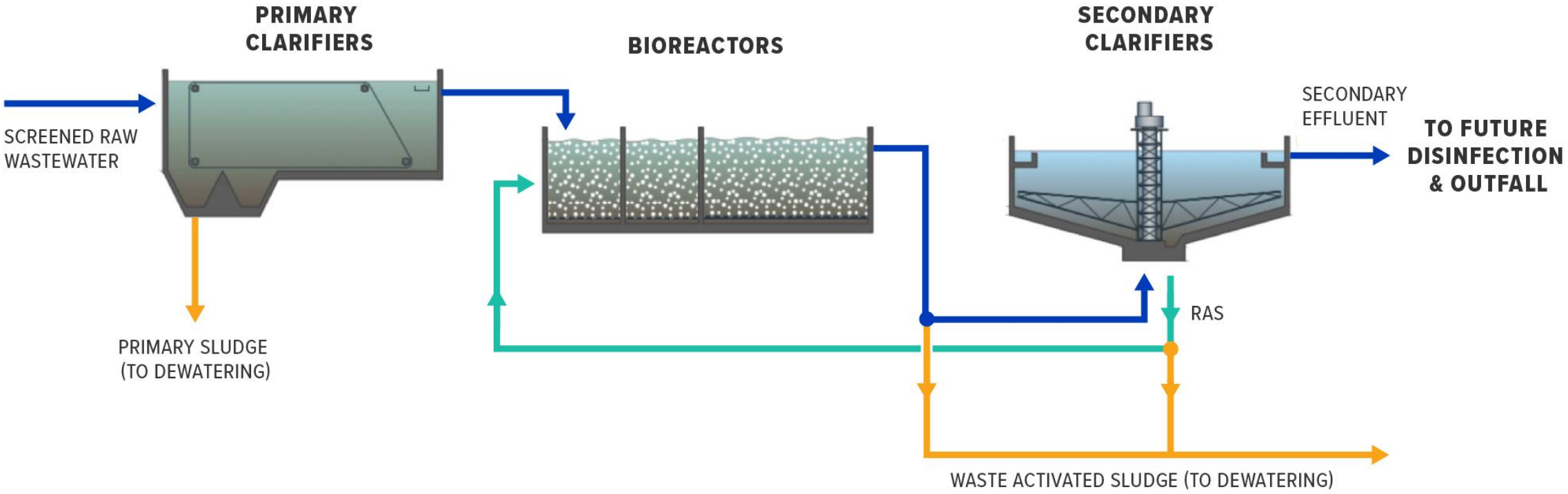
Wet Weather Treatment – Problem Definition

- Core of wastewater treatment consists of primary clarifiers, bioreactors and secondary clarifiers
- Primary and secondary clarifiers are sized based on peak flow
- Therefore, the 2.5% of flow has become the driver for upgrading these structures



Wet Weather Treatment – Problem Definition

- Furthermore, the peak wet weather flows consist of dilute wastewater
- These processes are designed for higher concentrations so their full potential is not being utilized



Wet Weather Treatment – Problem Definition

- Primary and secondary clarifiers are large concrete tanks with complex piping and associated pumping
- Considerable cost to upgrade

Secondary Clarifier

Primary Clarifiers

Wet Weather Treatment

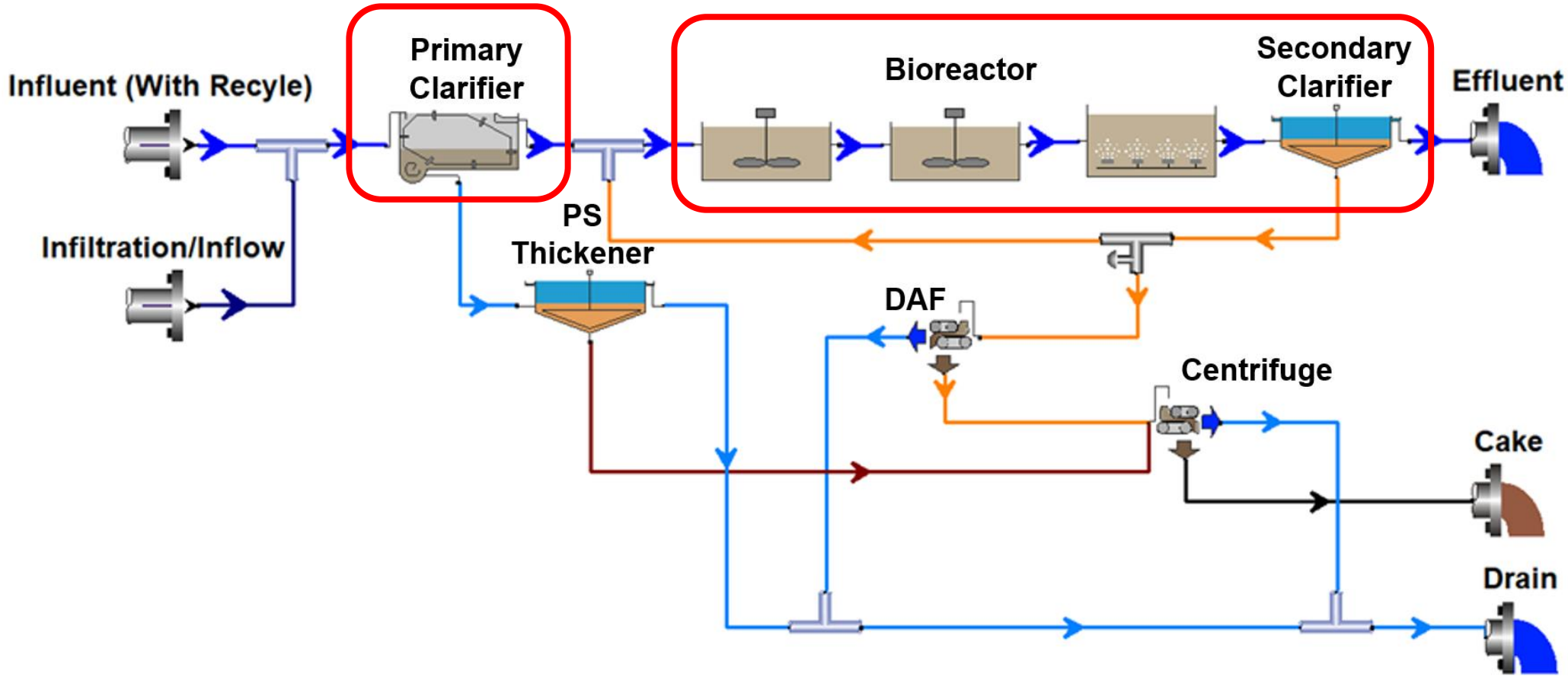
- Wet weather generated peak flows are expected to grow in the future
- Adding clarifiers tanks to meet this inflow is a logical approach but comes at a high cost
- Is there an alternative strategy for managing peak flows that is more cost-effective while meeting or exceeding the effluent quality objectives?

Wet Weather Treatment – Upgrade Options

- Upgrade requirements for 2 alternatives developed for comparison against the baseline scenario:
  - Baseline Option – upgrade as conventional primary/secondary treatment
  - Option 1 – add Chemically Enhanced Primary Treatment (CEPT) to baseline
  - Option 2 – add CEPT and implement a wet weather treatment strategy
- How does the required cash flow expenditure for options compare against the baseline strategy?

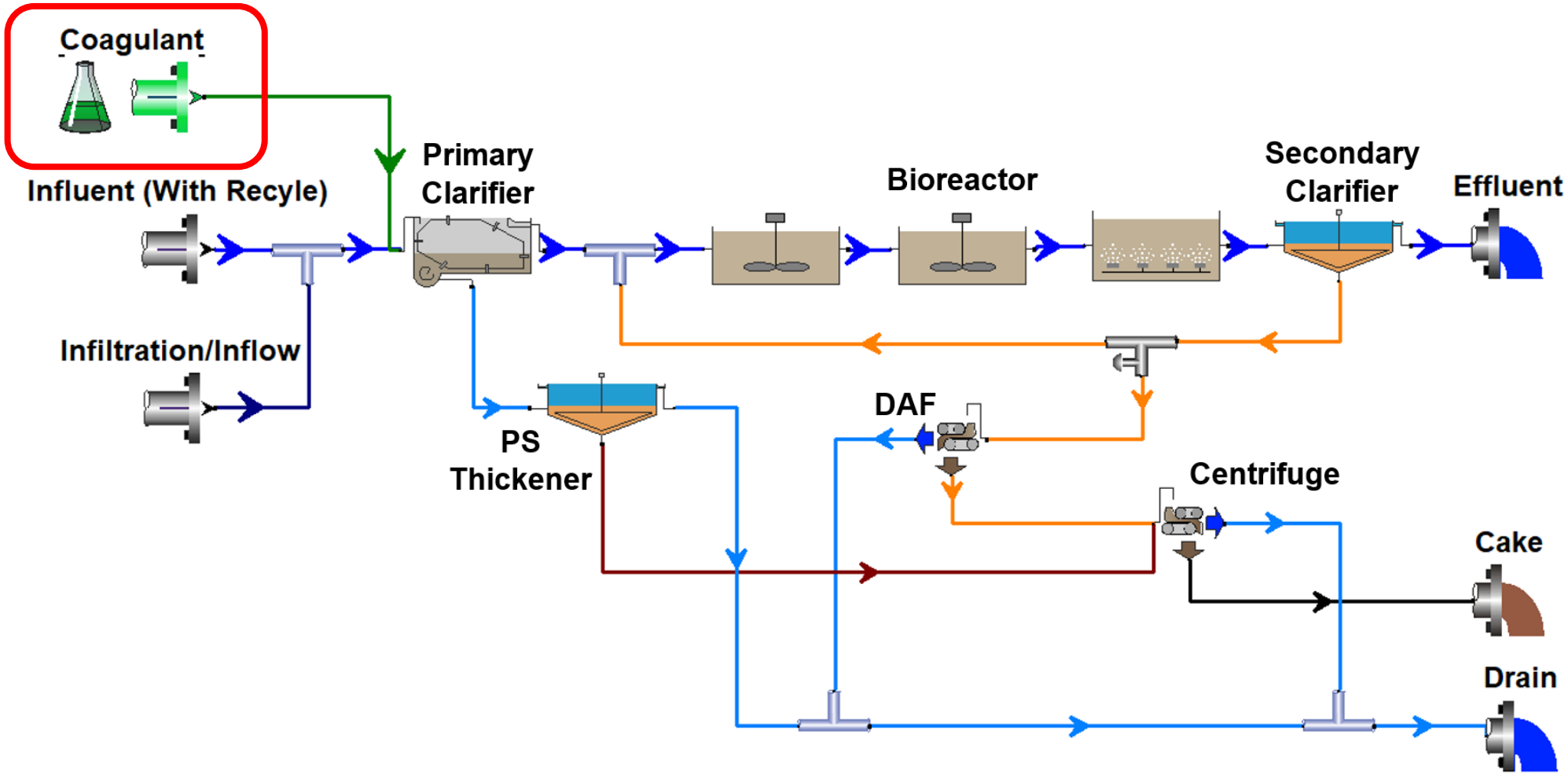
Baseline – Primary/Secondary Treatment

- Under a baseline scenario, primary clarifiers (PCs), bioreactors and secondary clarifiers (SCs) are added as required based on peak flow



Option 1 – CEPT With Primary/Secondary Treatment

- With chemically enhanced primary treatment (CEPT) a coagulant/flocculant is added to PCs to increase capacity by at least 20%

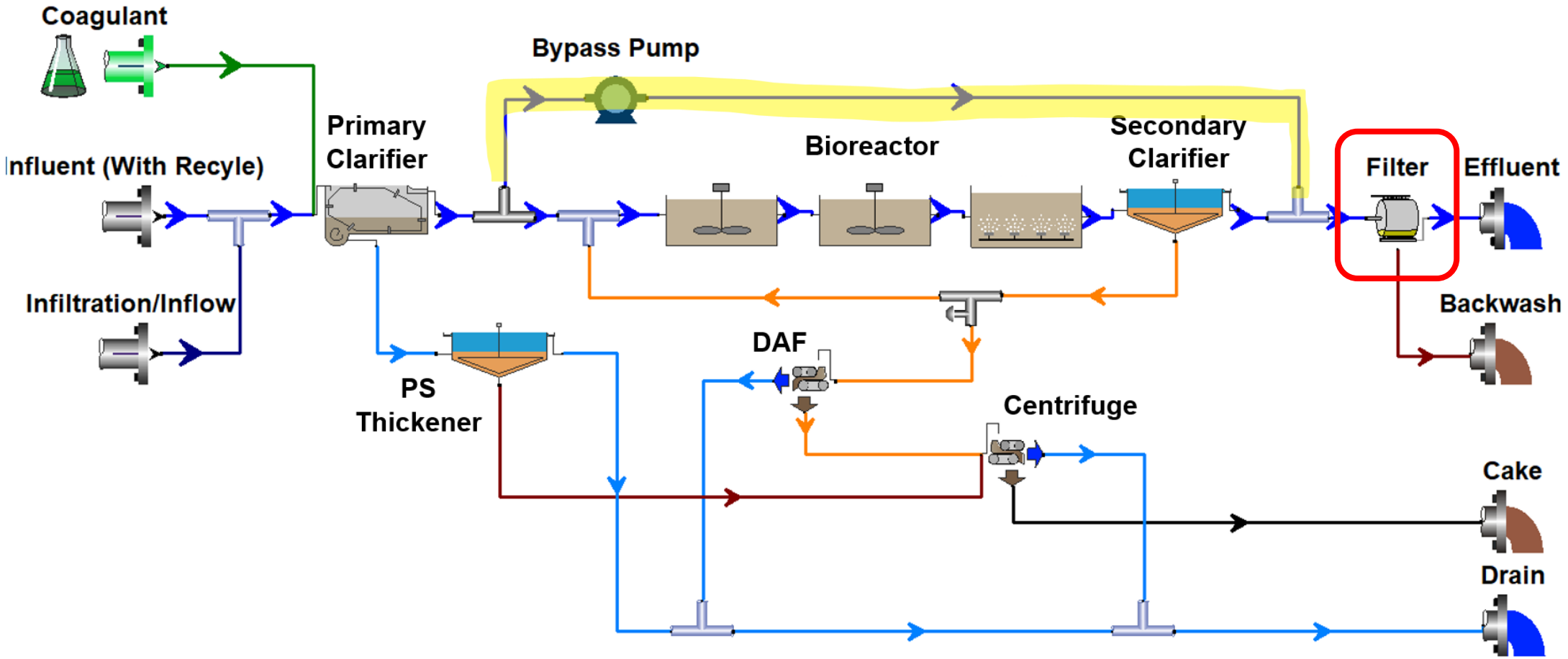


Option 1 – CEPT With Primary/Secondary Treatment

- Chemical coagulant/flocculant causes suspended particles to agglomerate and settle faster
- Under this option, chemical addition would occur only during peak wet weather (i.e., the 2.5% of flow)

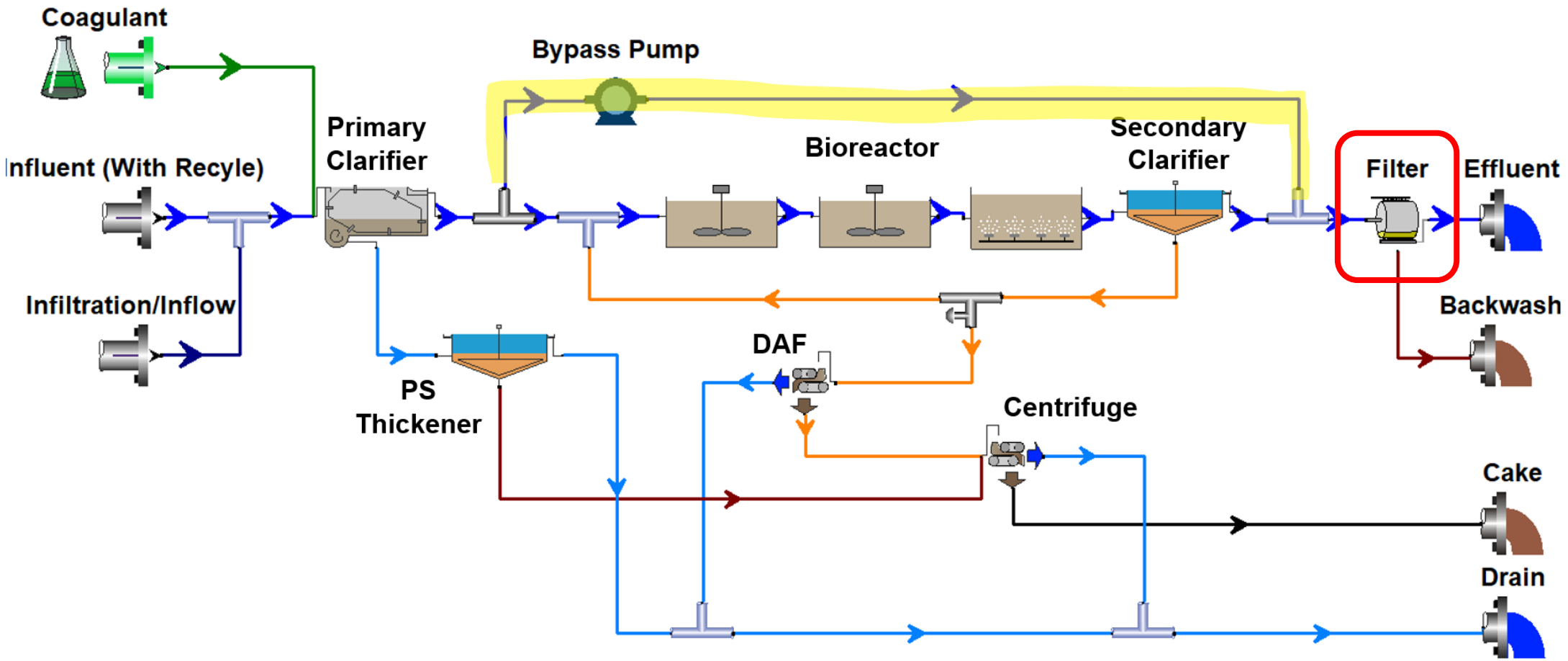
Option 2 – Wet Weather Treatment

- Option 2 includes a high-rate wet weather treatment process and CEPT
- During wet weather, peak flows greater than 2xADWF (i.e., the 2.5%) are bypassed to filter for treatment and blended with secondary effluent



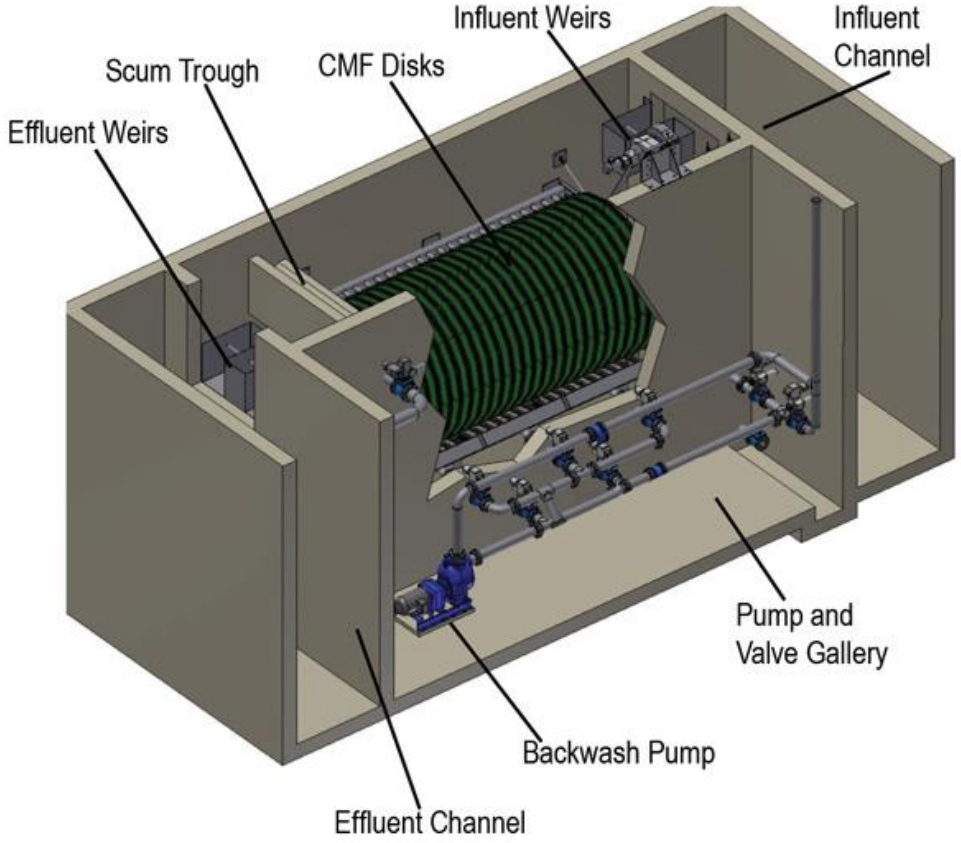
Option 2 – Wet Weather Treatment

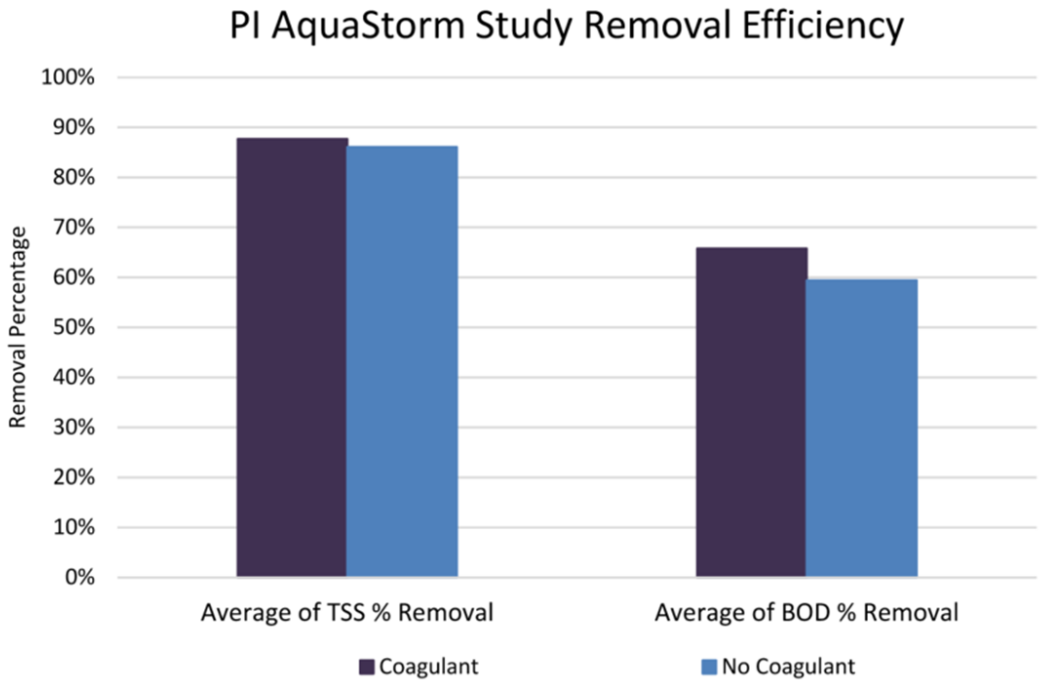
- In effect, flows to bioreactor and secondary clarifier are truncated during periods of high, dilute inflow



Option 2 – Wet Weather Treatment

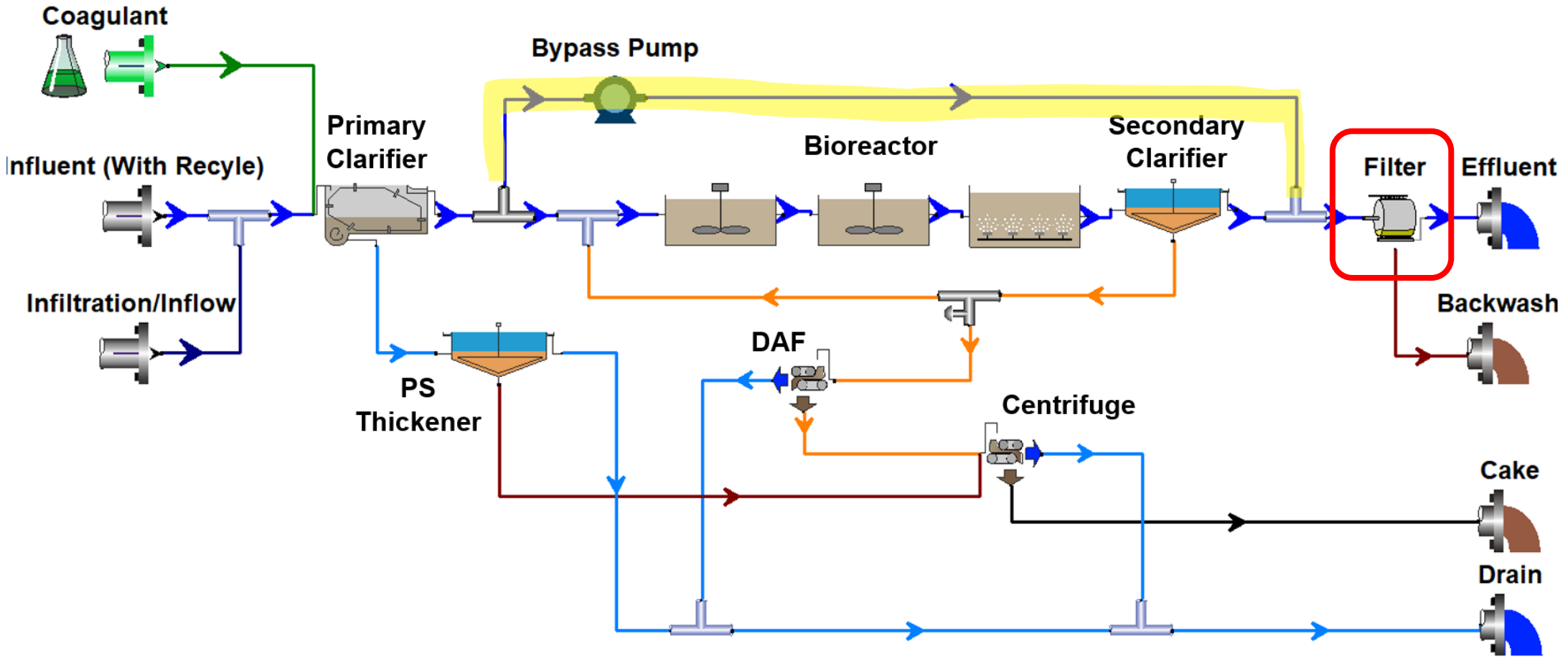
- Cloth media tertiary filter is designed specifically for wet weather treatment
- Effective pore size of 5 microns can achieve good TSS and BOD removal





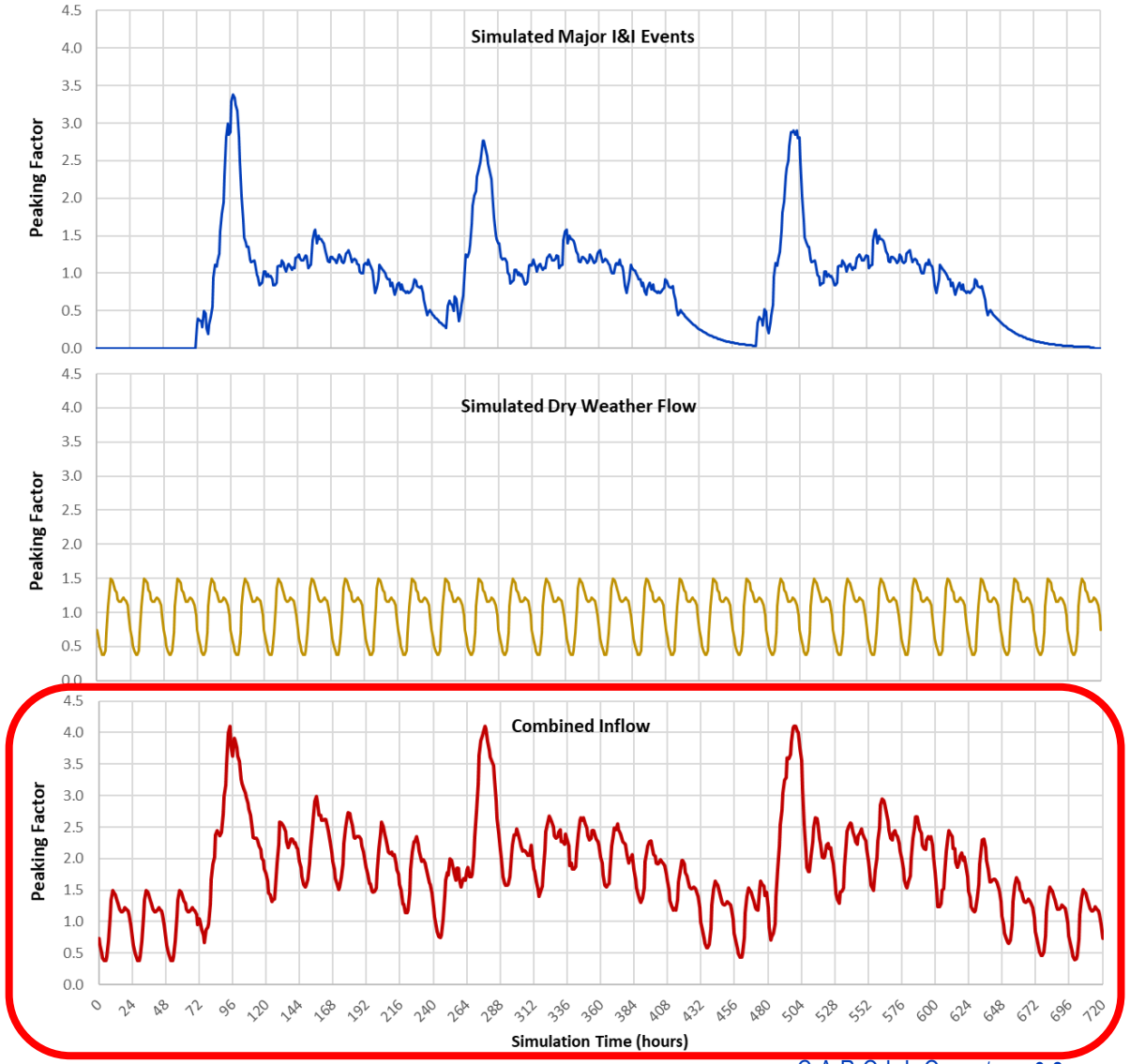
Option 2 – Wet Weather Treatment

- Filtration would treat the entire effluent flow
- On an annual average basis the effluent quality will be higher than baseline with filtration



Option 2 – Wet Weather Treatment

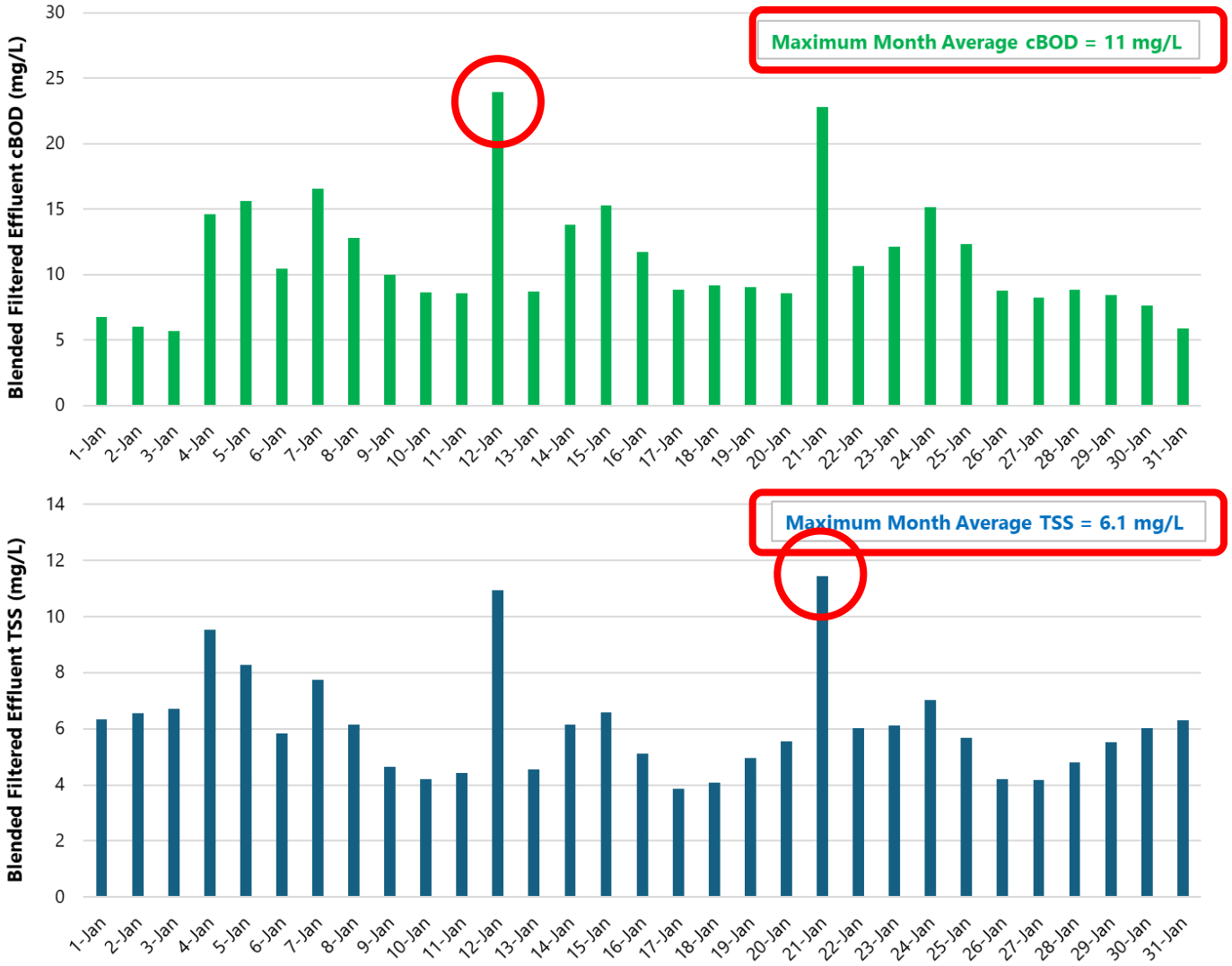
- Process modelling used to confirm wet weather treatment performance
- A worse-case storm scenario was simulated
- Peak hour flows more than 4xADWF
- Peak day flows > 3xADWF
- Sustained flows > 2xADWF



Option 2 – Wet Weather Treatment

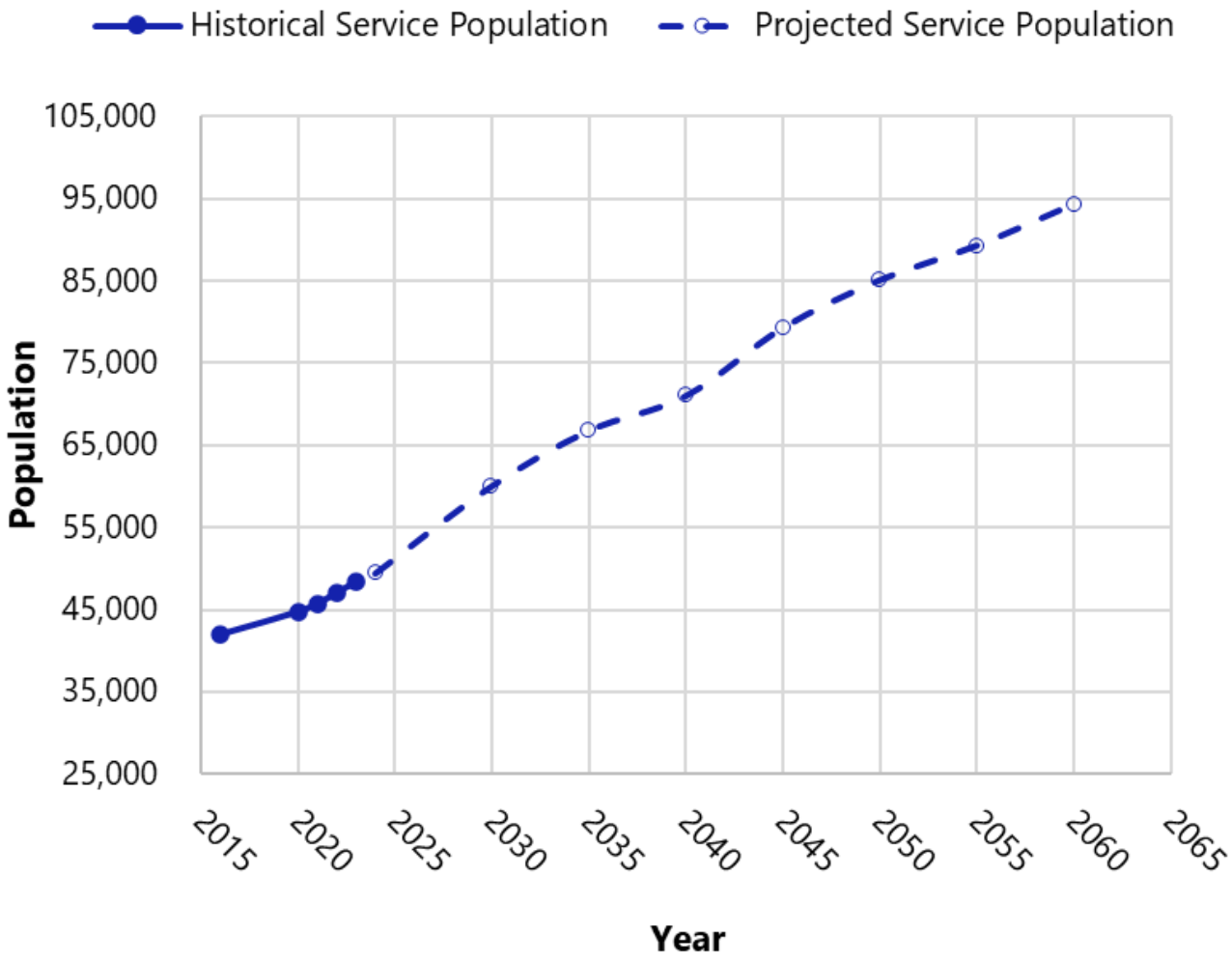
- Modelling indicates wet weather treatment is able to meet max month and max day regulatory effluent objectives:

Effluent Parameter	Final Effluent Objective
cBOD	Monthly average < 25 mg/L Maximum day < 45 mg/L
TSS	Monthly average < 25 mg/L Maximum day < 45 mg/L



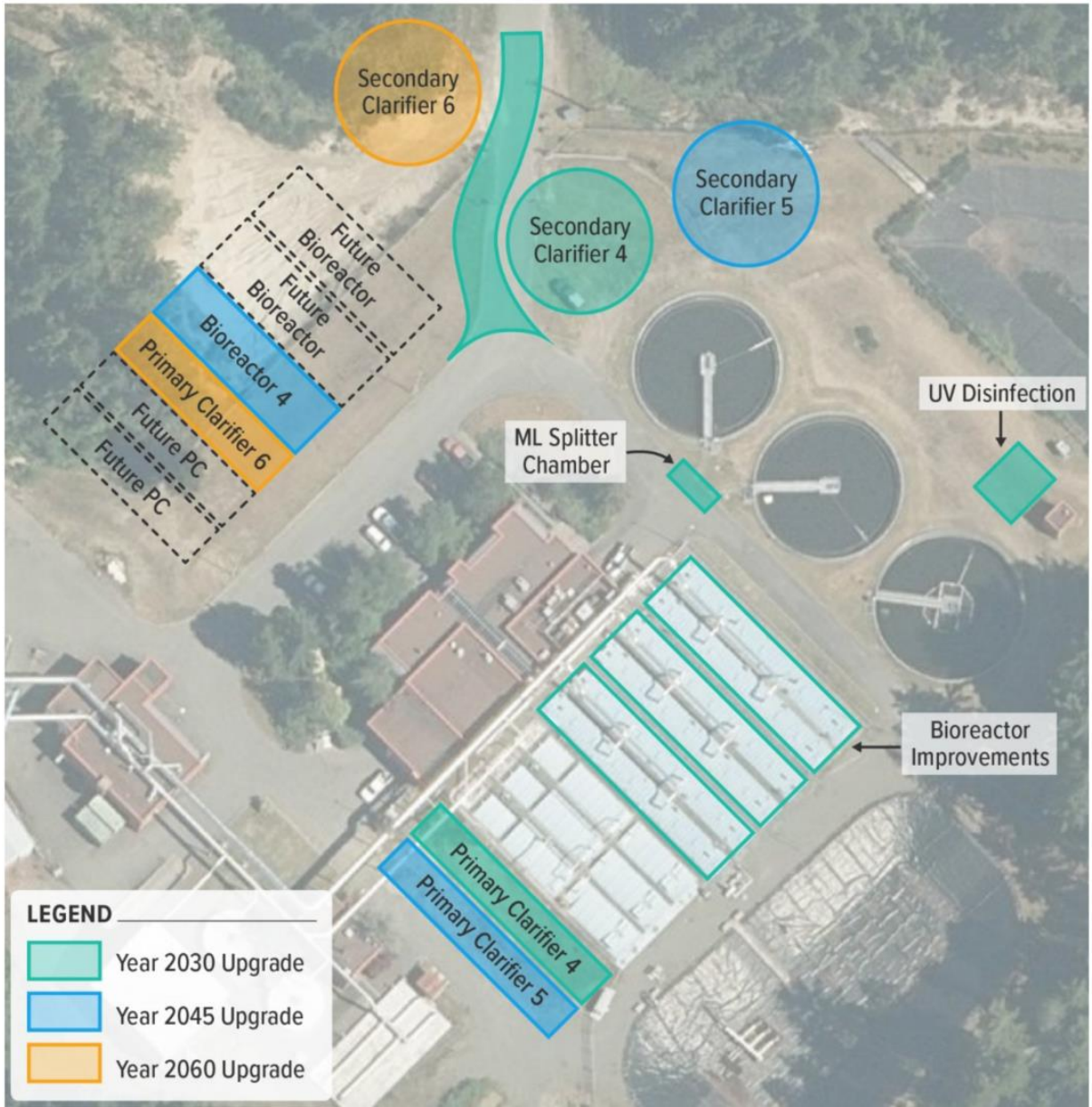
Upgrade Staging

- Upgrade staging was developed for each option to assess cash flow
- Projected service population up to year 2060 used to develop staging



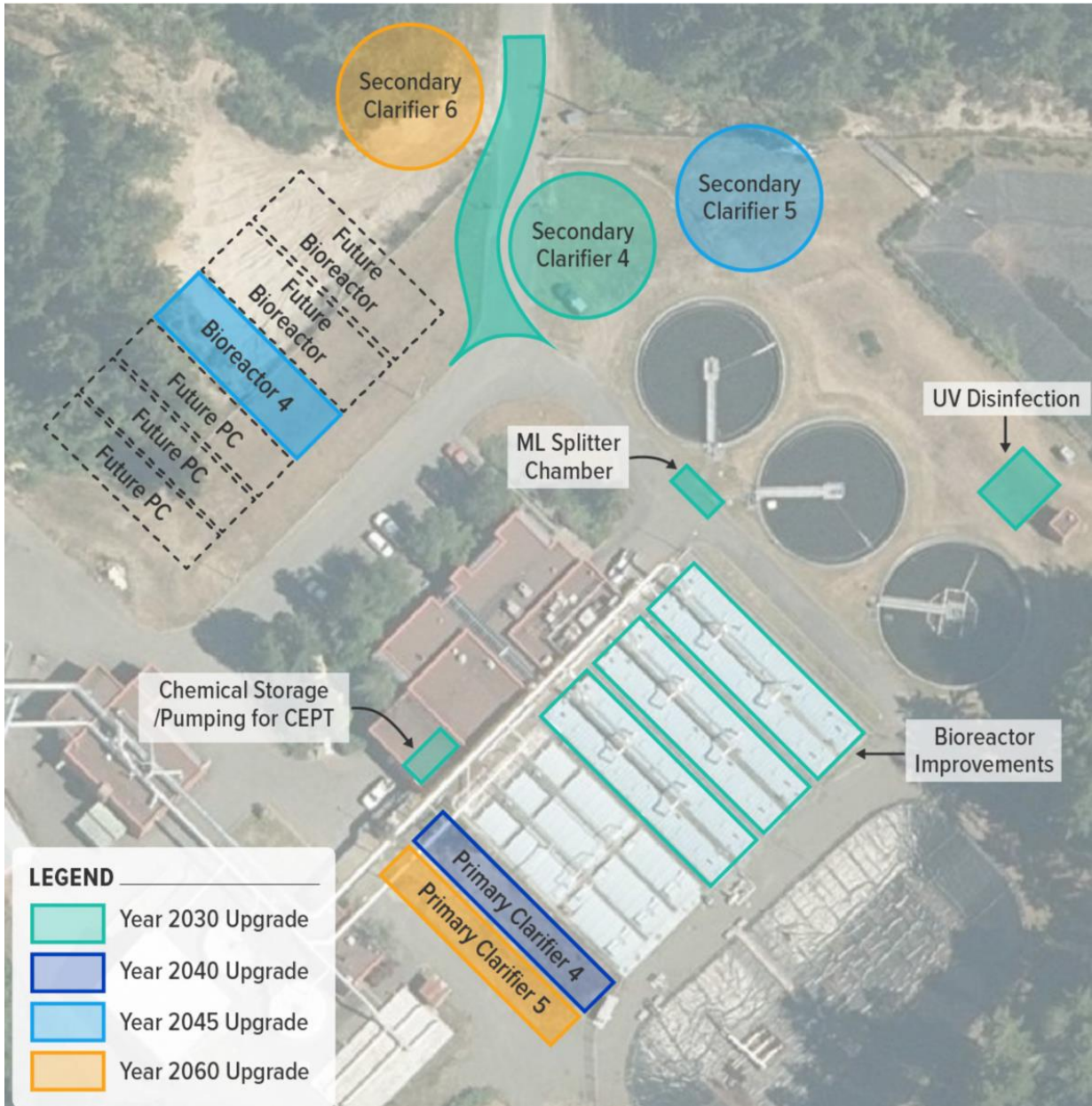
Upgrade Staging – Baseline Option

- Under baseline upgrade scenario, 6 PCs, 4 bioreactors and 6 SCs required by 2060
- Requirement for PCs and SCs is driven by peak hydraulic loading



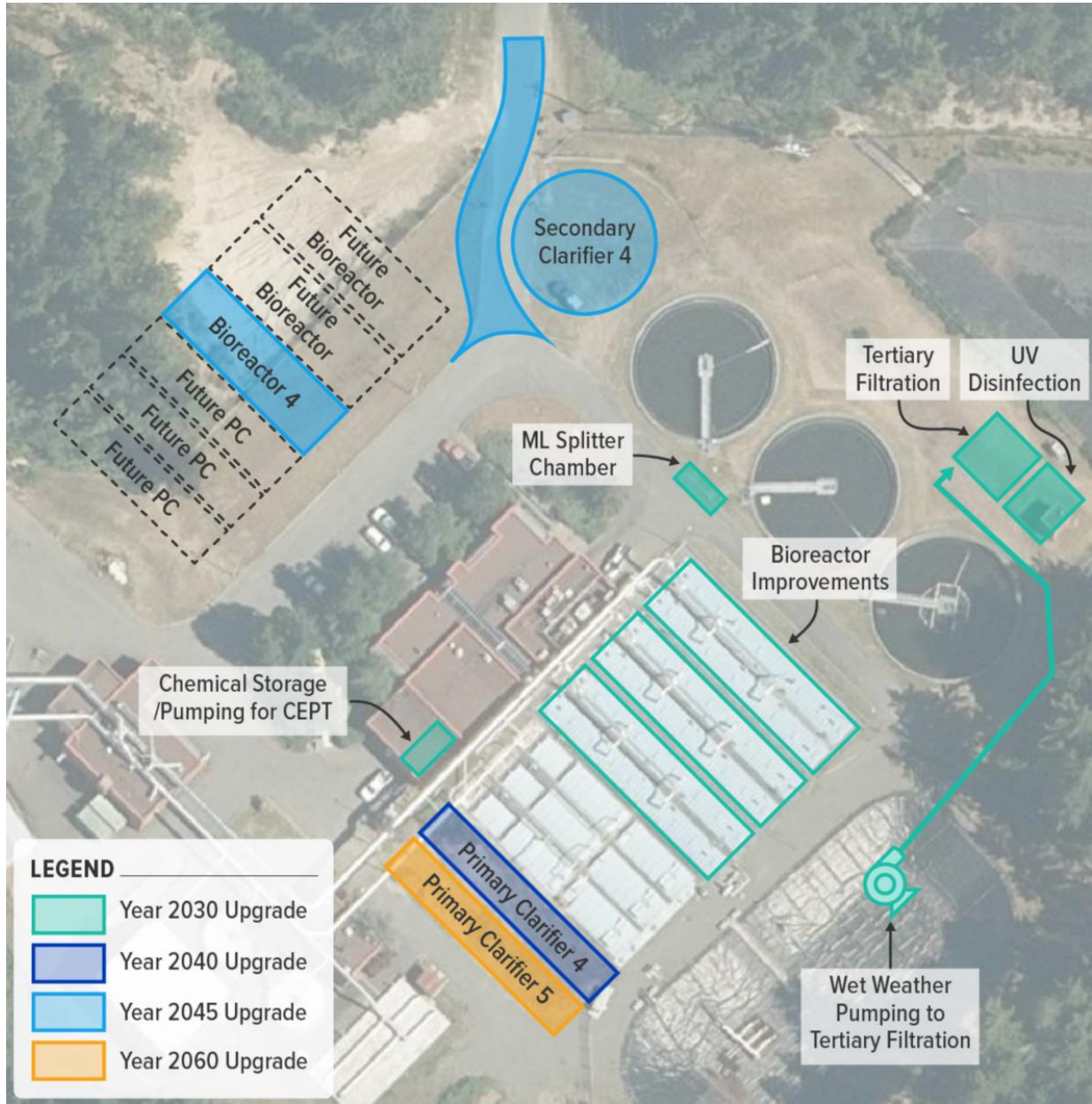
Upgrade Staging – Option 1

- For CEPT option, PC upgrades are able to be deferred with 5 required by year 2060
- Requirement for SCs does not change compared to Baseline



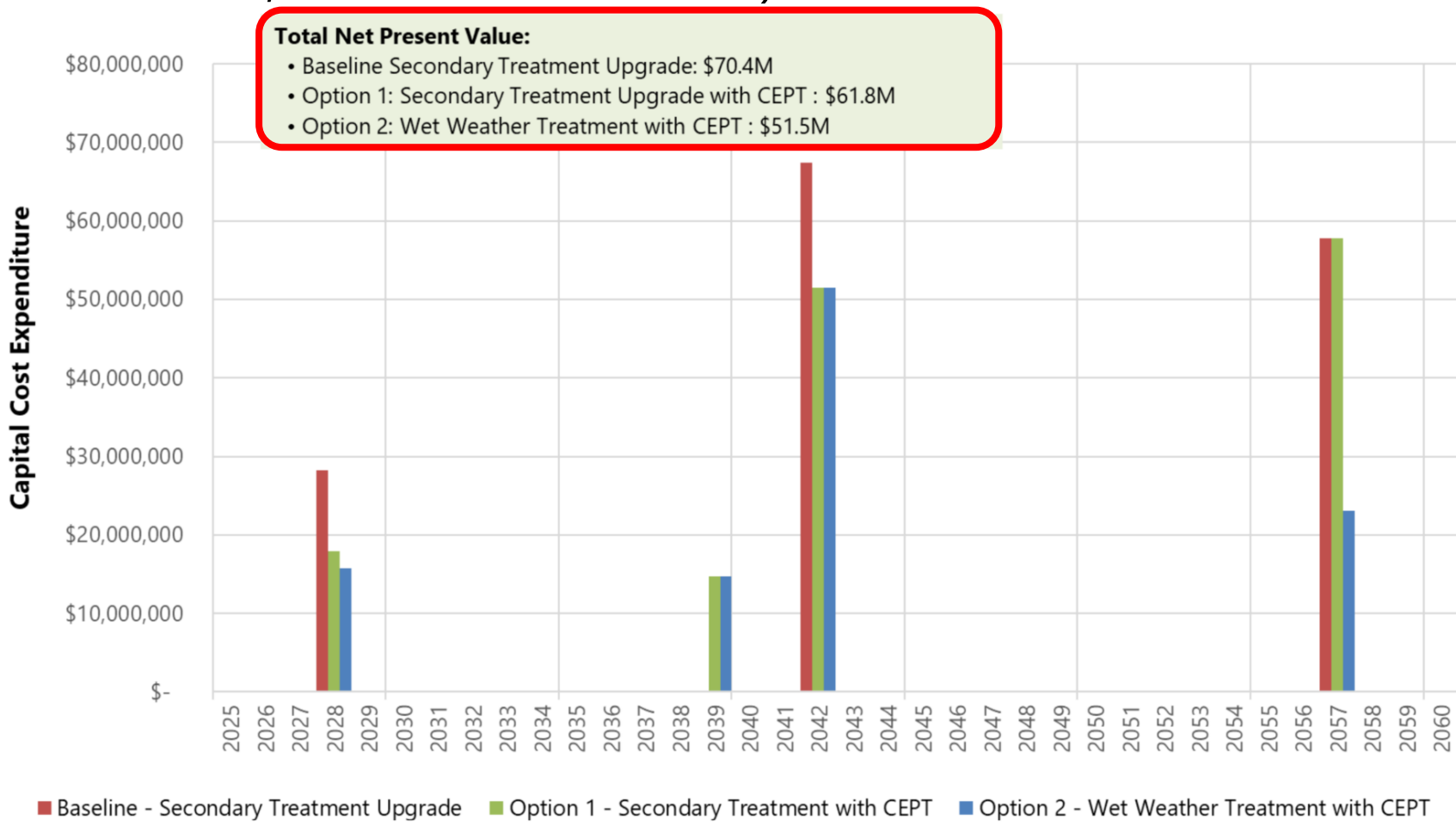
Upgrade Staging – Option 2

- With CEPT and wet weather treatment, both PC and SC upgrades are able to be deferred
- 4 SCs required by 2060 compared to 6 for Baseline
- Requires a tertiary filter by year 2030
- What is the value of these deferred capital costs?



Net Present Value Comparison

- Cost estimates based on Class 5 level of detail
- Upgrades common to all options not part of cash flow (i.e., solids treatment, splitters, bioreactor improvements, UV disinfection etc.)
- Wet weather treatment with CEPT has lowest cost – almost $20M less than Baseline



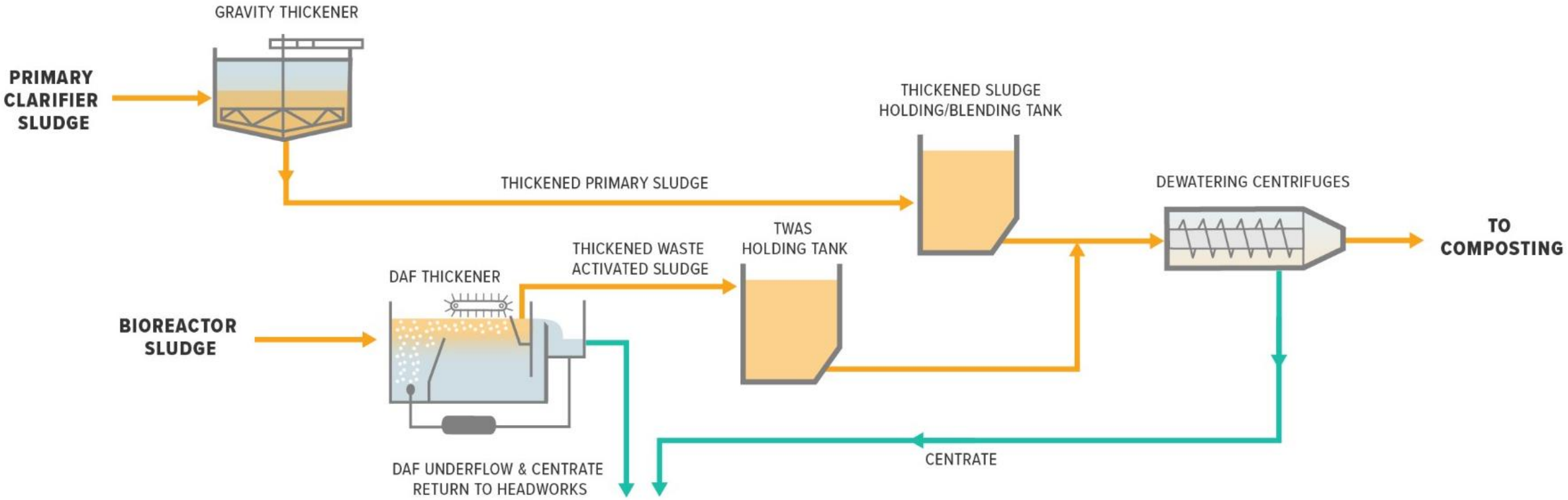
Summary Results and Findings

- Implementing CEPT increases the existing PC capacity and defers upgrades
- Peak wet weather flows more than 2xADWF can be diverted to effluent filter, blended with mainstream flow and meet regulatory objectives
- By limiting peak flows to the secondary treatment process, upgrade requirements to secondary clarifiers is reduced
- Tertiary filtration will improve effluent quality under dry weather flow conditions, allowing for more efficient UV disinfection and more reuse potential

4 Solids Management

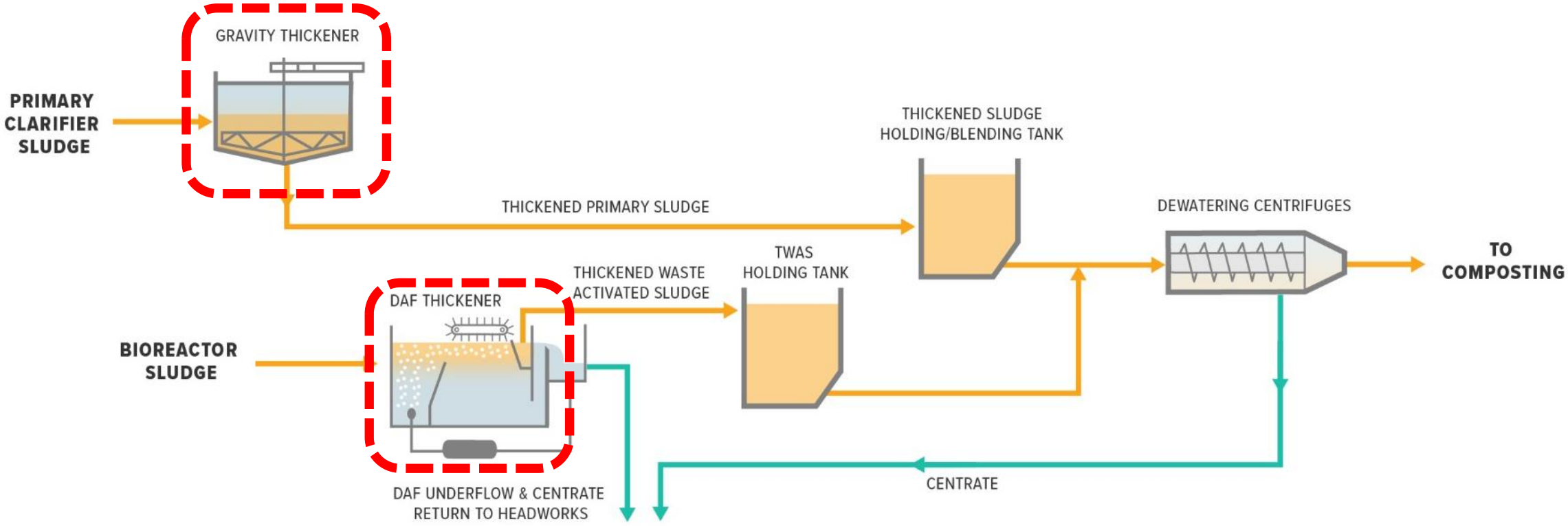
Solids Management

- Sludge production is continuous and management is important
- As part of facility plan, level of redundancy was assessed to address risk
- Regulations do not specifically address redundancy



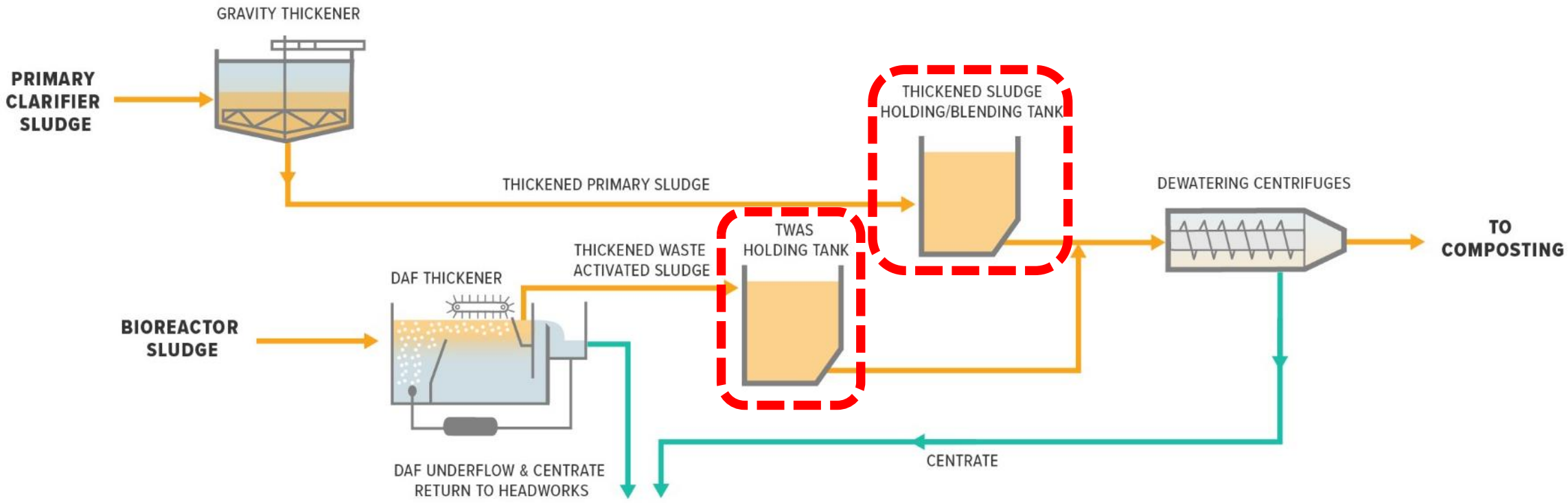
Solids Management

- Settled sludge from primary clarifiers and biological growth from bioreactors is first thickened in separate processes
- Thickening is continuous but dewatering is not



Solids Management

- Centrifuges operate Monday to Friday but sludge produced continuously
- Storage is important for managing night-time and weekend production

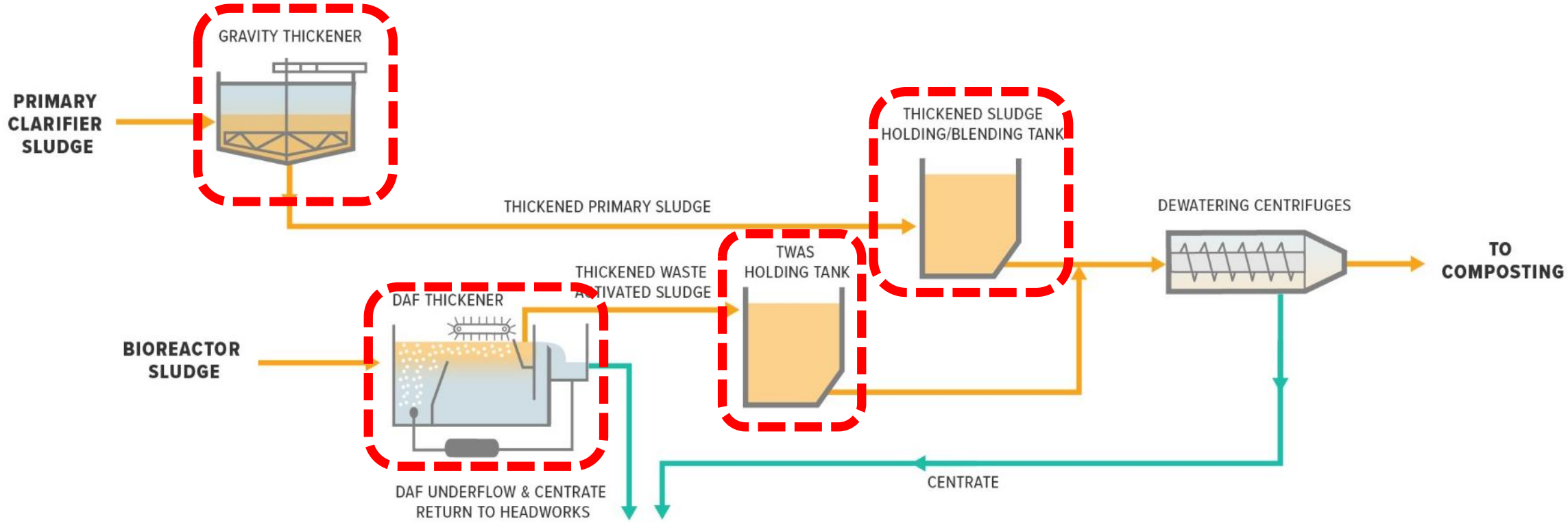


Solids Management

- Redundant centrifuges provided and can be run longer if needed
- Dewatering centrifuges are 20 years old but function well
- Deferring upgrade to year 2040 is proposed but requires adding or extending shifts – currently 5 days per week
- Ventilation in centrifuge room will be improved to minimize hydrogen sulphide exposure – safer for staff and protects equipment

Solids Management

- Additional storage and thickener capacity will be required by 2045
- This would be the time to explore alternatives (i.e., anaerobic digestion)



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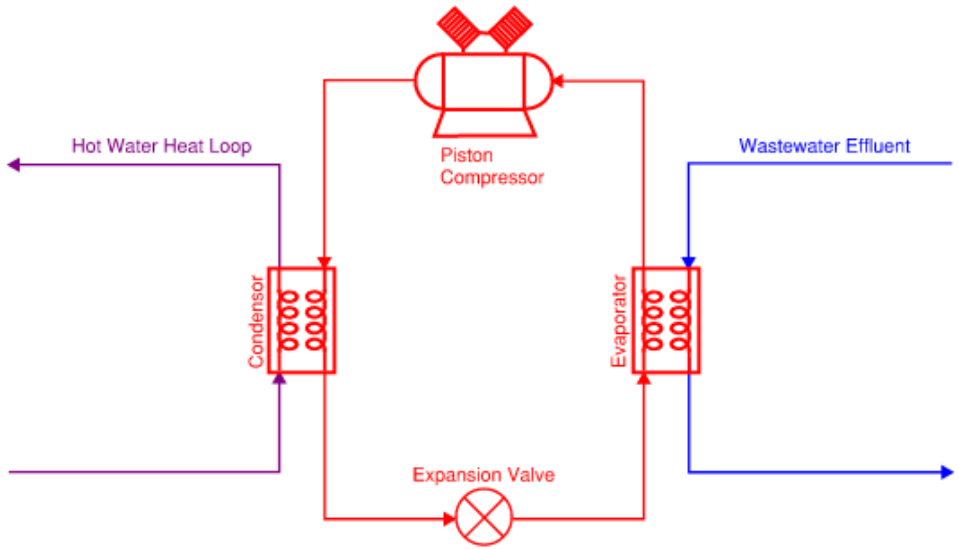
Resource Recovery Options

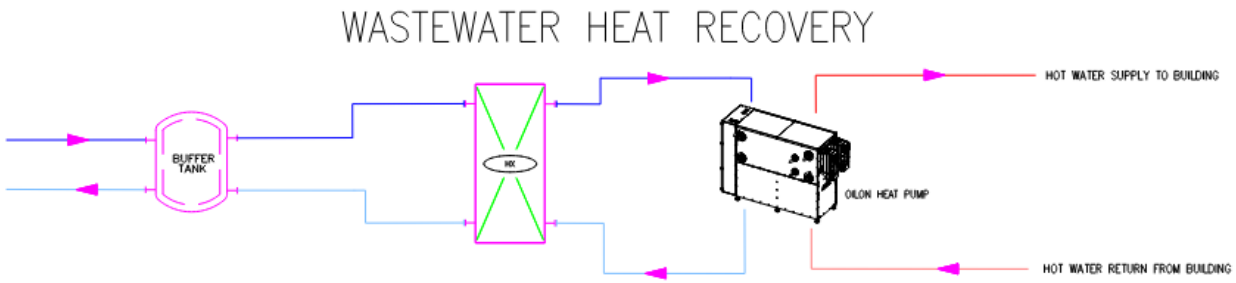
Resource Recovery Options

- The LWMP described resource recovery options and recommended they be considered as part of facility uprade planning
- Options are under review and include:
  1. Reclaimed water reuse
  2. Heat recovery from wastewater
  3. Anaerobic digestion for biogas & nutrient recovery

Resource Recovery Options – Heat Recovery

- Heat can be extracted from effluent and used as a renewable source of energy – similar to household air-to-air heat recovery
- This approach has become increasingly more common at wastewater treatment facilities
- A heat pump can be used to transfer heat from effluent with the existing boiler system maintained as a back-up system





Resource Recovery Options – Reclaimed Water

- Reuse of treated plant effluent is regulated under MWR
- Could replace on-site process water demand currently met with potable water
- Several reclaimed water uses for filling tanks, cleaning of process equipment or pump seal water and landscape irrigation
- Represents a significant portion of the water demand at the CVWPCC

Resource Recovery Options

- **High capital costs** make these options challenging to support financially
- **Payback period is greater than** the expected lifespan of the equipment
- **Non-economic drivers** are compelling (improved sustainability and energy-saving)
- **Not currently being pursued as part of upgrades**, but will be reconsidered separately
- **Grant funding** could change the calculus

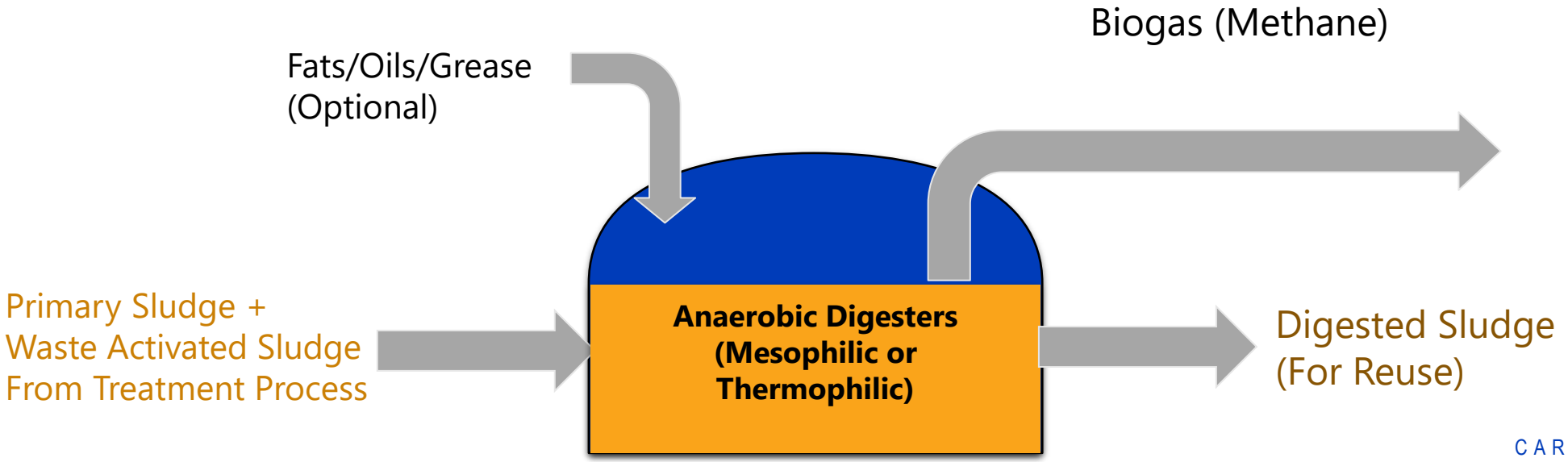
Name	Units	Reclaimed Water		Heat Recovery
		With Irrigation	Without Irrigation	
Net present value (20 yr)	$ in 2024	($514,000)	($606,000)	($695,000)
Payback Period	years	30	29	43

Resource Recovery Options – Anaerobic Digestion

- Currently, dewatered sludge is composted and sold locally as SkyRocket, a Class A compost.
- However, relies on increasing demand that matches population growth
- Changing regulations to control emerging contaminants could impact operations
- To address risk, other pathways considered which can also provide resource recovery value

Resource Recovery Options – Anaerobic Digestion

- Anaerobic digestion occurs in the absence of oxygen at elevated temperature (35°C or 55°C)
- Biosolids are converted into biogas and stabilized by different types of microorganisms in a large digester tank – approximately 50% solids reduction.
- Digestion opens up new opportunities for land application and recovery of resources (methane and nutrients)
- Digested sludge can also be composted to allow continued supply of SkyRocket



Resource Recovery Options – Thermal Drying Biosolids

- Thermal drying is a biosolids management technology producing Class A biosolids through heat treatment.
- Benefits:
  - Produces of Class A or Class B biosolids
  - Reduces the volatile solids resulting in less volume for transportation and disposal.
  - Can be used as a feedstock for high temperature thermal destruction (i.e., pyrolysis)

Resource Recovery Options – Biosolids Management

Recommendation:

- The CVWPCC should continue the use of composting, as other biosolids management options (anaerobic digestion, thermal drying) have significant capital costs for a facility of this size
- As composting facility approaches capacity or when upgrades to sludge process required in year 2045, reassess anaerobic digestion as a staged upgrade
- Should regulations become more stringent or the market for SkyRocket decreases, the CVWPCC could also consider thermal drying as an outlet

6

Staging Plan

Staging Plan

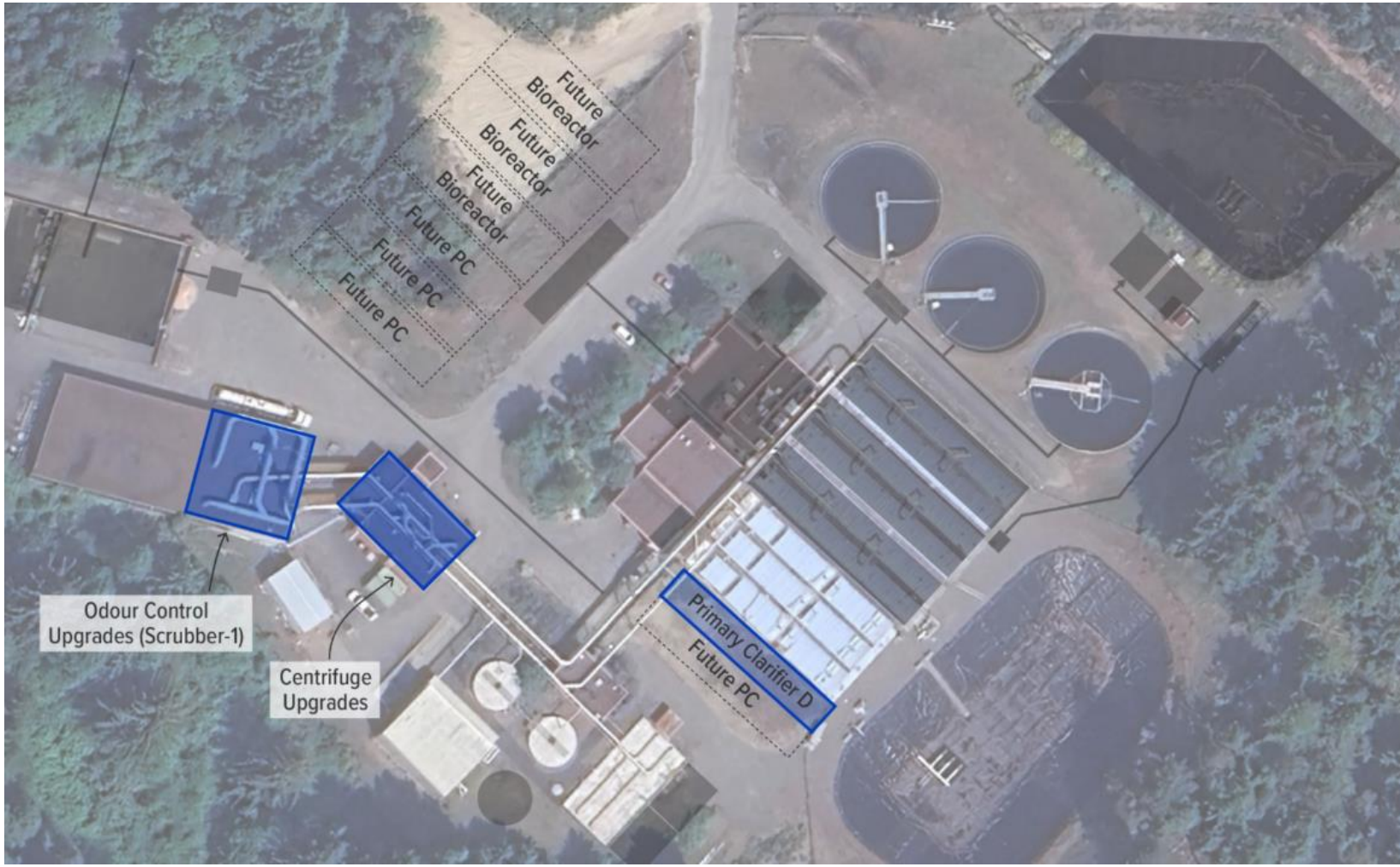
- Based on foregoing analyses, draft upgrade plans developed to year 2060

Phase 4 Site Plan

- Phase 4 upgrades to be completed by year 2030
- Major facilities upgraded or added:
  - New electrical service
  - New headworks
  - UV disinfection
  - Tertiary filtration
  - Bioreactor updates
  - Effluent pump upgrade
  - Admin building retrofit
  - Odour control

Phase 5 Site Plan

- Phase 5 upgrades to be completed by year 2040
- Major facilities upgraded or added:
  - New primary clarifier
  - Increased dewatering centrifuge capacity
  - Odour control upgrades

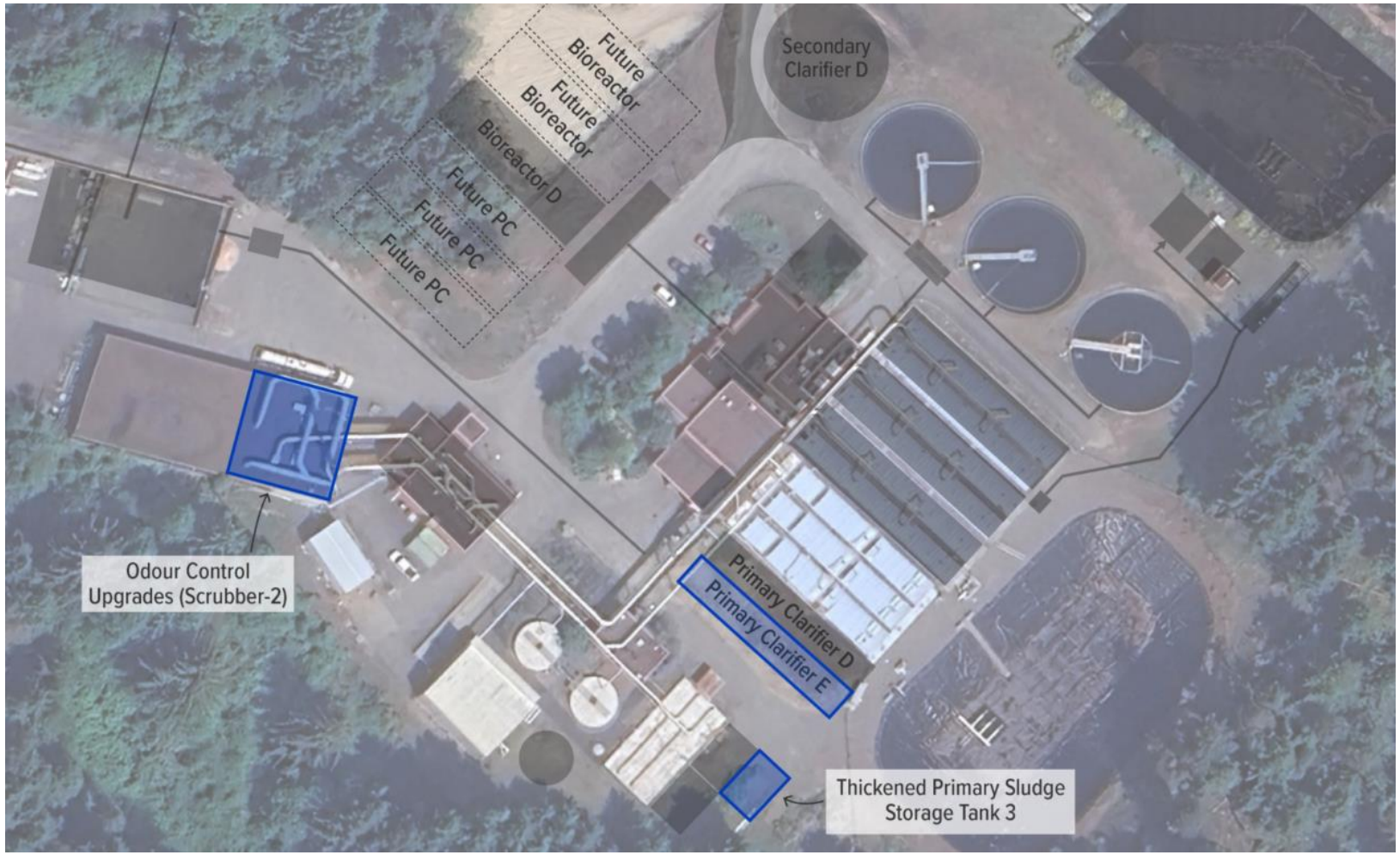


Phase 6 Site Plan

- Phase 6 upgrades to be completed by year 2045
- Major facilities upgraded or added:
  - New bioreactor train
  - New secondary clarifier
  - Sludge storage
  - New gravity thickener and sludge storage

Phase 7 Site Plan

- Phase 7 upgrades to be completed by year 2060
- Major facilities upgraded or added:
  - New primary clarifier
  - Additional sludge storage tank
  - Odour control upgrades



Closure

- Recommended scope of Phase 4 upgrades will be finalized once Site Master Plan complete
- Additional design is being advanced to refine cost estimate

Thank you

Stage 3 LWMP Scope- Source Control
WSP

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CVSS Stage 3 LWMP Update

Michael Desilets, P. Eng., PMP
Principal Engineer
Water and Wastewater Treatment and Facilities
WSP Canada Inc.

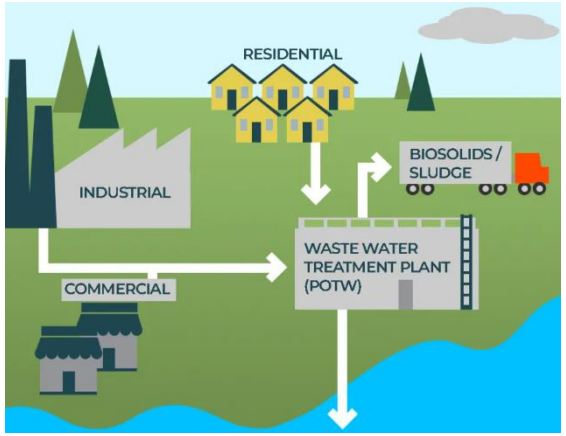
Outline

1. Stage 3 LWMP Overview
2. Source Control Program

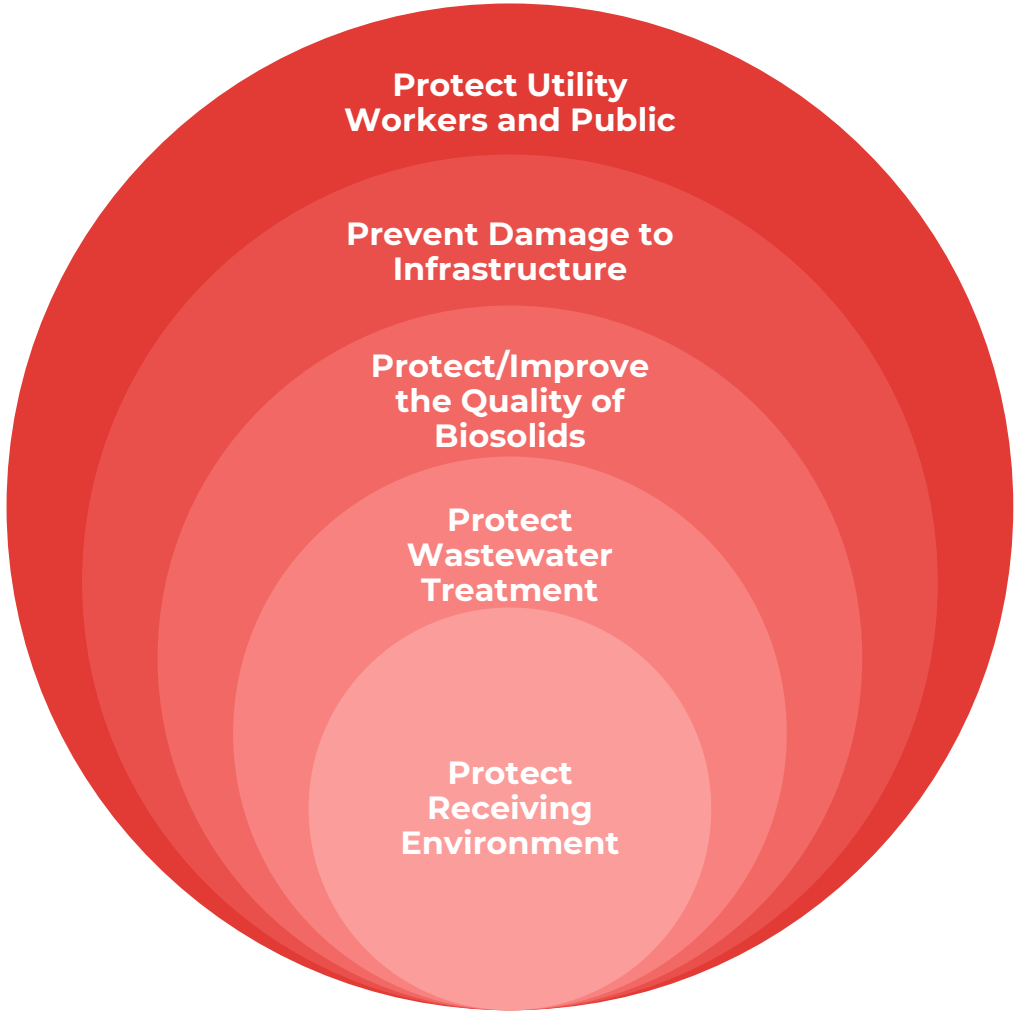
Source Control Program

Source Controls Overview

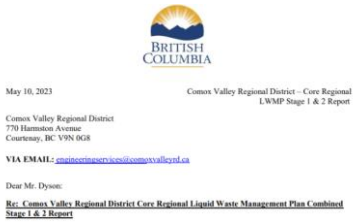
Best Practices used to discourage and reduce problematic pollutants at their source before they enter the sewage system



Objectives of Source Control Programs



Drivers for Source Control Program


BRITISH COLUMBIA

May 10, 2023 — Comox Valley Regional District – Core Regional LWMP Stage 1 & 2 Report

Comox Valley Regional District
770 Harmston Avenue
Courtenay, BC V9N 0G8

VIA EMAIL: engineeringservices@comoxvalleyrd.ca

Dear Mr. Dyson:

Re: Comox Valley Regional District Core Regional Liquid Waste Management Plan Combined Stage 1 & 2 Report

Address Ministry Comments Stage 1&2 LWMP

Ensure Stage 3 LWMP includes commitment to develop Source Control Program

Meet Ministry LWMP Guidelines

Source Control important planning component for approval of LWMP and based on community specific issues and priorities

Meet BC MWR Regulatory Requirement

Source Control Bylaw requirement for acceptance of non-domestic wastewater.

Incorporate and Address Public Feedback

Public concerns around contaminants of emerging concern (CECs), microplastics and a need for education around what not to flush.

Approaches to Source Control

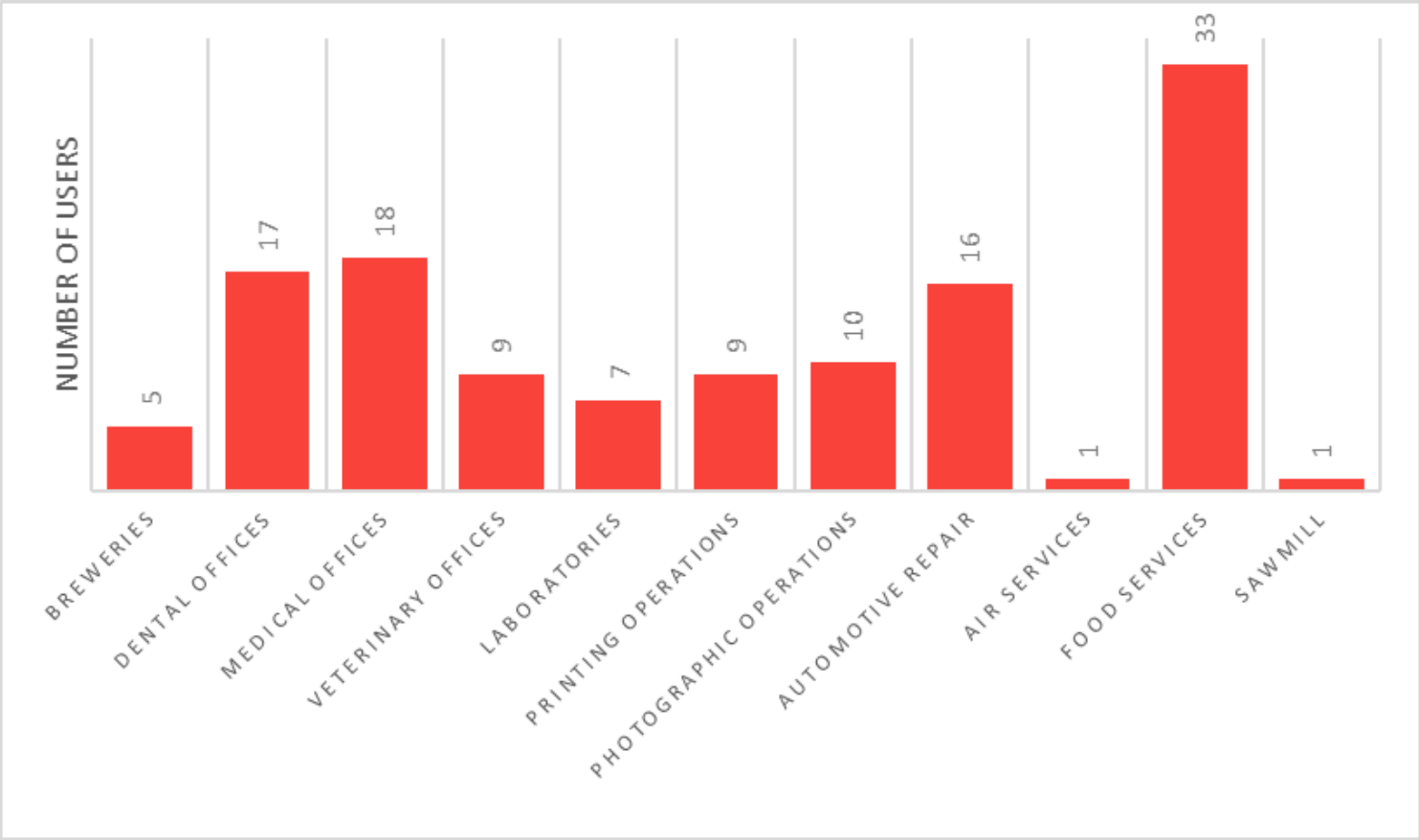
Approach	Focus and Implementation	What's Included
Educational What Are You Putting Down Your Pipes? 	• Focus on both domestic and non-domestic discharges • Implemented through education programs and campaigns	• Municipality Fact Sheet Web Pages • Printed brochures • Social media/online campaigns • Public workshops
Regulatory Bylaw Lookup 	• Focused on non-domestic discharges (ICI) • Implemented through Sewer Use Bylaw	• Restricted and prohibited compounds • Requirements for permits and authorizations • Monitoring and enforcement • Industry / business specific codes of practice

Stage 3 LWMP Work on Source Control

Current Source Controls

Approach	Focus and Implementation	What's Included
Educational What Are You Putting Down Your Pipes? 	• "What Are You Putting Down Your Pipes" CVRD Web page • "Septic System Education" CVRD Web Page	• Focus on obstructive wastes • Proper disposal of pharmaceuticals • Keeping toxic compounds out of storm sewers • Fact sheet and webinar focused on Septic Systems
Regulatory Bylaw Lookup 	• TOWN OF COMOX BYLAW NO. 713 • CITY OF COURTENAY BY-LAW NO. 1327	• Description and listing of prohibited discharges / substances, • Standards for waste discharges including, requirements for connecting to the sewerage system • Pre-treatment requirements for industrial and high strength wastewaters, volume control, • Offenses and penalties for violation of the bylaw

CVRD User Characteristics



- Industrial parcels was estimated to be 12 in the CVRD, 11 in Comox and 146 in Courtenay.
- The majority of these parcels are identified as “light industrial”, which have a variety of uses and may not produce nondomestic wastewater
- User outreach and survey program to identify all potential non-domestic IIC discharges to the CVSS, evaluate compliance with existing Courtenay and Comox sewer use bylaws, and inform the development of a regional source control program.

Outcomes and Benefits

- Expected to be well received by the public
- Established based on community specific issues and priorities
- Discourage/regulate/reduce the discharge of problematic waste
- Contribute to reduced capital and O&M costs associated with infrastructure
- Account for operability or treatment concerns at the CVWPCC
- Demonstrate further action to address public and stakeholder feedback
- Specific Project/initiative approval through LWMP
- Meet regulatory requirements for regulation of non-domestic discharges
- Ministry's requirements and expectations for approval of the Stage 3 LWMP

Recommendations

Key Commitment: Develop framework for an effective source control program including improved or added source control measures

1. Strengthen and harmonize Comox and Courtenay Sewer Use Bylaws based on community specific issues and priorities.
    - With this, also develop a strategy and policy for consistent application and enforcement to all system users, and in particular current and future non-domestic discharges.
2. Develop and execute educational campaigns focused at domestic users on one or more of the following topics:
    - Microplastics: Awareness and alternatives and use reduction.
    - Persistent organic compounds, PFAS: Awareness of sources, alternatives, and use reduction.
    - Pharmaceuticals and personal care products: Proper disposal and products to avoid.
    - Non-flushables and hazardous household products: Proper disposal options and preventing discharges to sewer system.
    - Survey of IIC sewer users to identify any IIC users discharging non-domestic liquid waste, and assess compliance with existing Sewer use bylaws.
        - Use the survey to develop an inventory of IIC users and inform updates to municipal sewer use bylaws and educational programs for businesses/industry.

Questions on Source Control LWMP Planning Component?

Thank you

wsp.com

Update on Outfall Path Forward and Results of Condition Assessment

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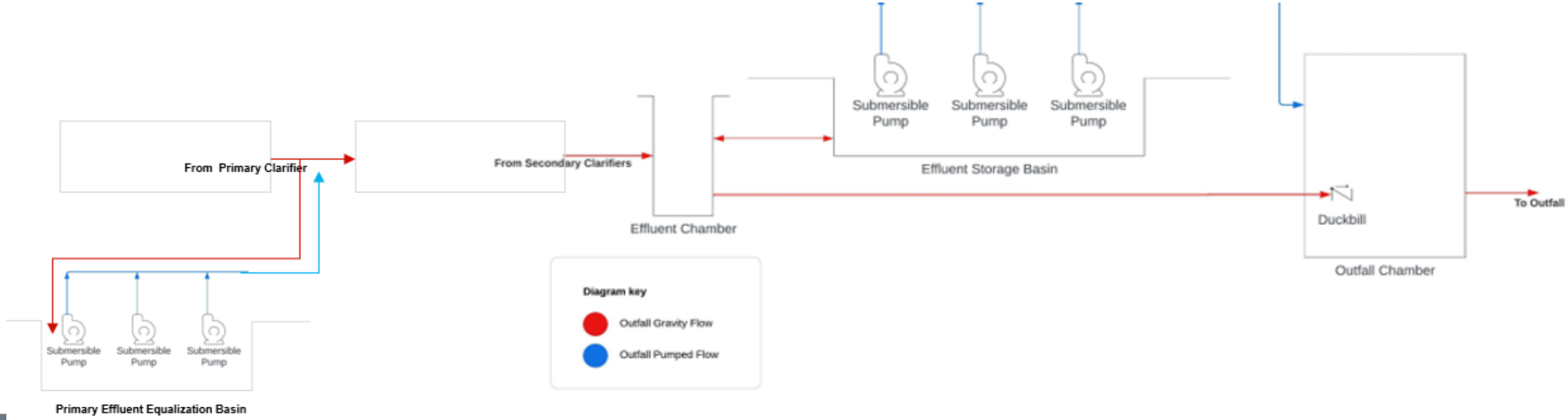
Overview of Outfall System

- Constructed in 1982
- Outfall includes onshore, offshore and diffuser sections
- System primarily flows by gravity
- System includes effluent storage basin and primary effluent equalization basin (PEEQ) to pump effluent when capacity limitations occur



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Key Stage 1& 2 Decisions and Recommendations
Outfall

- Inspections of the offshore section of the outfall have revealed surface corrosion and some areas where the concrete encasement has separated from the pipe.
- The capacity of the outfall is a concern during high tide/high wastewater flow conditions.
- An effluent storage and equalization basin are in use to prevent overflows, but there are concerns that increasing wastewater flows may lead to overflows
- Upgrading or replacement of the outfall will be required by the year 2030
- Upgrades including a new outfall pipe with pumped assistance was recommended for future flows

Current Challenge

- Capacity limitations during Peak Wet Weather Flow and High Tides
  - Effluent storage basin and pump station used in these situations
  - Primary Effluent Equalization Basin (PEEQ) commissioned in 2020 as temporary stop gap measure
- Predicted “Combined” capacity of outfall system with PEEQ to year 2031
- While the outfall pipe itself is not the limiting factor, increasing flows to the outfall will exert additional pressure on the pipe
- Better understanding of the condition of the outfall was recommended prior to deciding on full-scale or staged upgrading
- **Ministry Comment that timing and costs for outfall replacement need to be determined as part of Stage 3 LWMP**

Outfall Sections & Condition

Offshore and Diffuser Sections

- Inspected by remote operate vehicle in 2023
  - Some leakage around diffuser wye
  - Signs of corrosion on pipe exterior in some places
  - Few areas where there is damage to concrete pipe encasement

Photo 74 – Close Up of Possible Corrosion on Exposed Steel Pipe

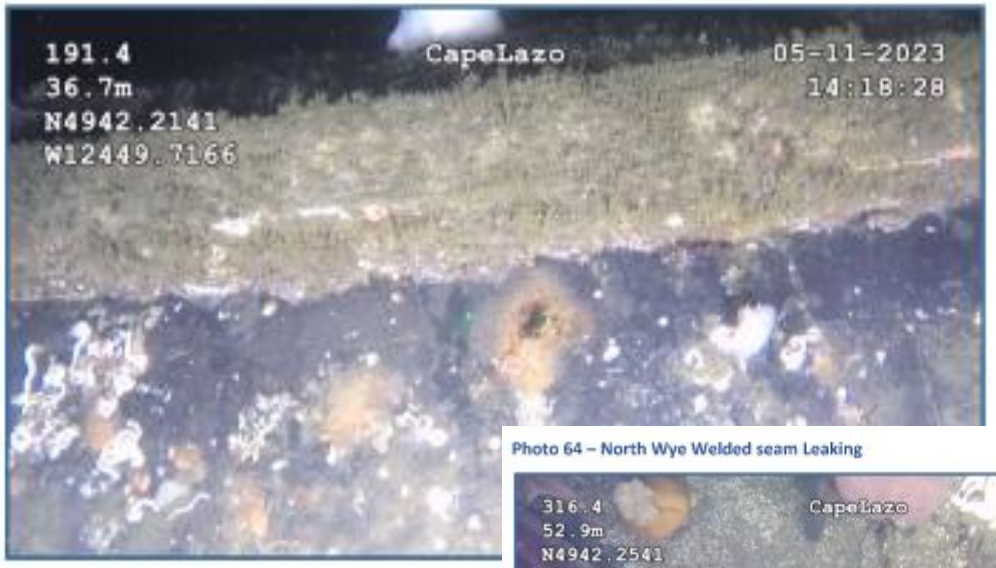

Photo 64 – North Wye Welded seam Leaking

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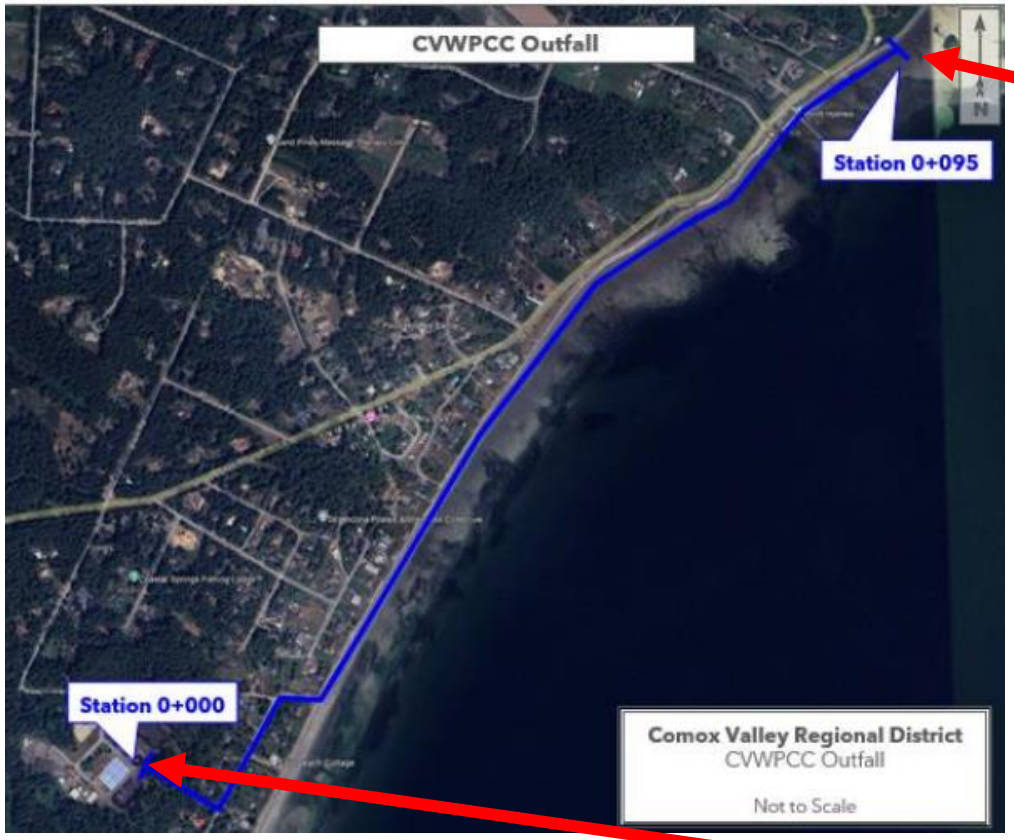
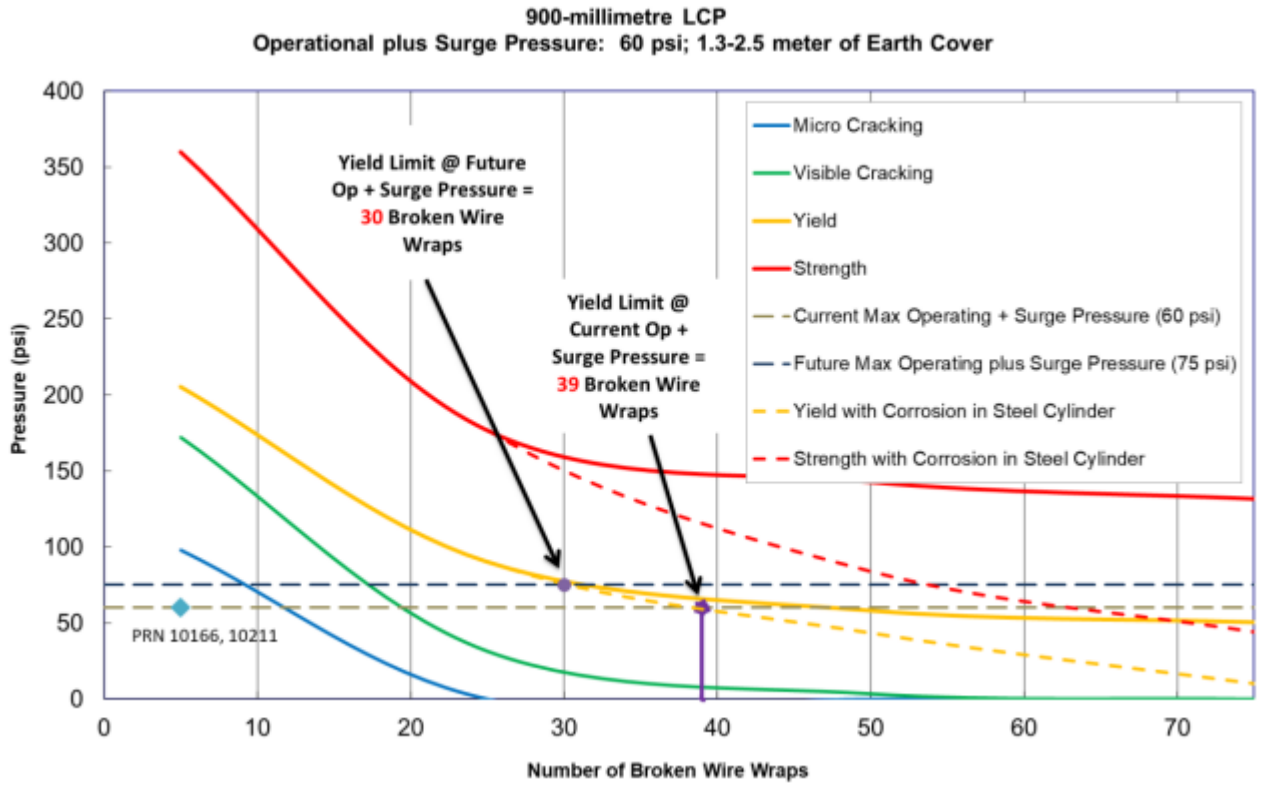
Onshore Section Condition Assessment



Electromagnetic Inspection Tool

Onshore Condition Assessment Results



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Path Forward

- Recommend proceeding with infrastructure upgrades necessary for approximately 10 year extension of capacity
  - Effluent pump station capacity
  - Modifications to outfall chamber
- Incorporate upgrades into phase 4 scope

Stage 3 LWMP Commitments

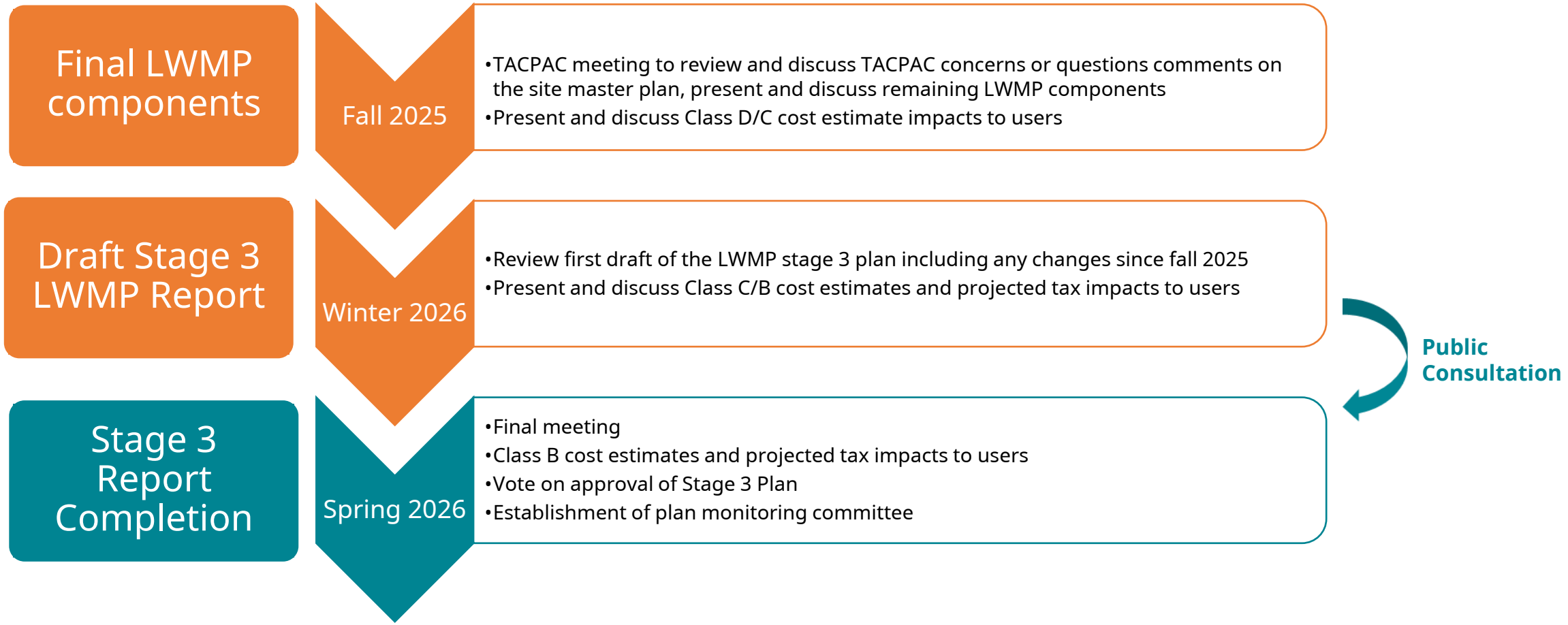
- Include interim upgrades and associated costs as part of phase 4 upgrade scope at CVWPCC
- Full outfall replacement and timing to be included/ reviewed as part of future LWMP plan update

Next Steps &
Engagement with TACPAC

Stage 3 LWMP Timing

- **Summer 2025:** Full site master plan sent via email to TACPAC for “light summer reading”
- **Now until winter 2026:**
  - Engagement with K'ómoks Chief and Council
  - Drafting Stage 3 LWMP Report
- **Fall 2025- Winter 2026:** Stage 3 report review
- **Spring 2026:** Stage 3 LWMP report submittal
- **2026:** Provincial Review
- **2027:** Plan approval and begin Phase 4 Upgrades

Planned TACPAC Meetings



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