Vintage Views Sewer & Lakeshore Waterworks Assessment Reports

Prepared for April 25, 2024 – Public Meeting

Liisa Bloomfield, Senior Manager of Utilities

Contains Slides prepared by Consultant - Ecora

Outline

- Acquisition steps
- Sewer system assessment
- Water system assessment
- Capital costs

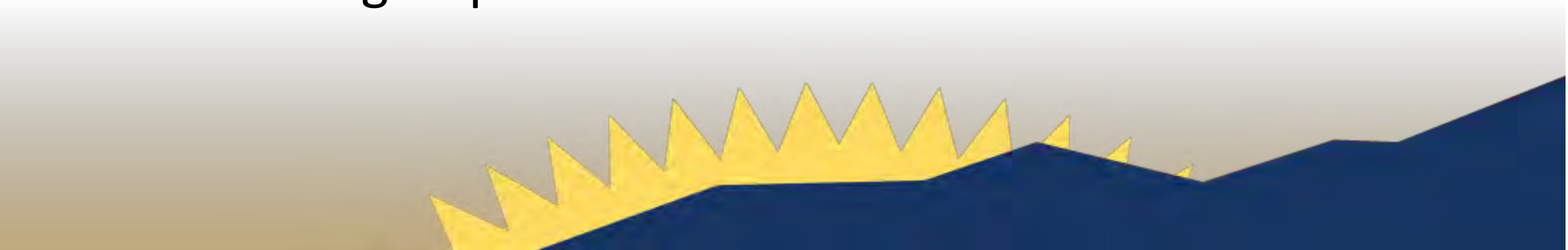


Acquisition Process

- Request to consider acquisition - *complete*
- **Engineering & Financial Assessment** - *complete*
- Financial, liability & asset review - *underway*
- RDOS and owner acquisition agreement
- Bylaws & assent process
- Transition plan
- Transfer of utilities

Acquisition Process

- **Engineering & Financial Assessment**
  - Evaluate the existing infrastructure
  - Compliance with legislation and standards
  - Capital costs for upgrades
  - Long term asset management
  - Staffing requirements

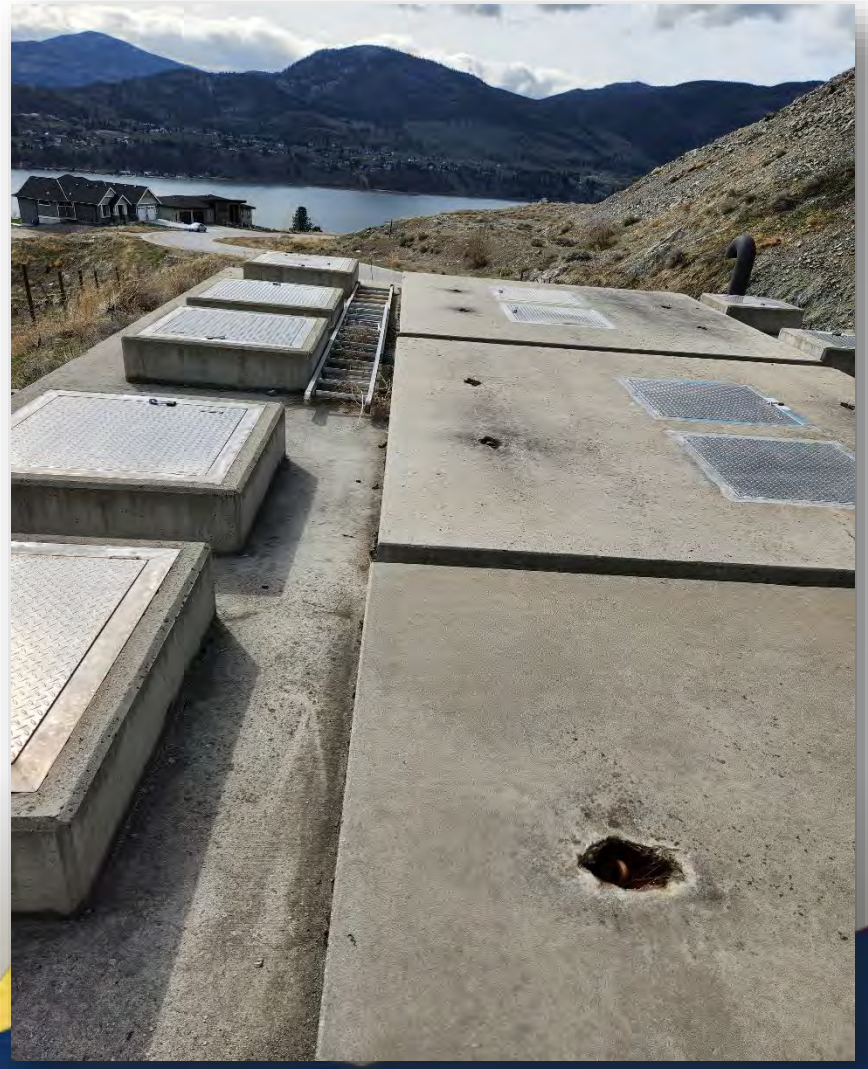




Assessments of the Vintage Views Wastewater System

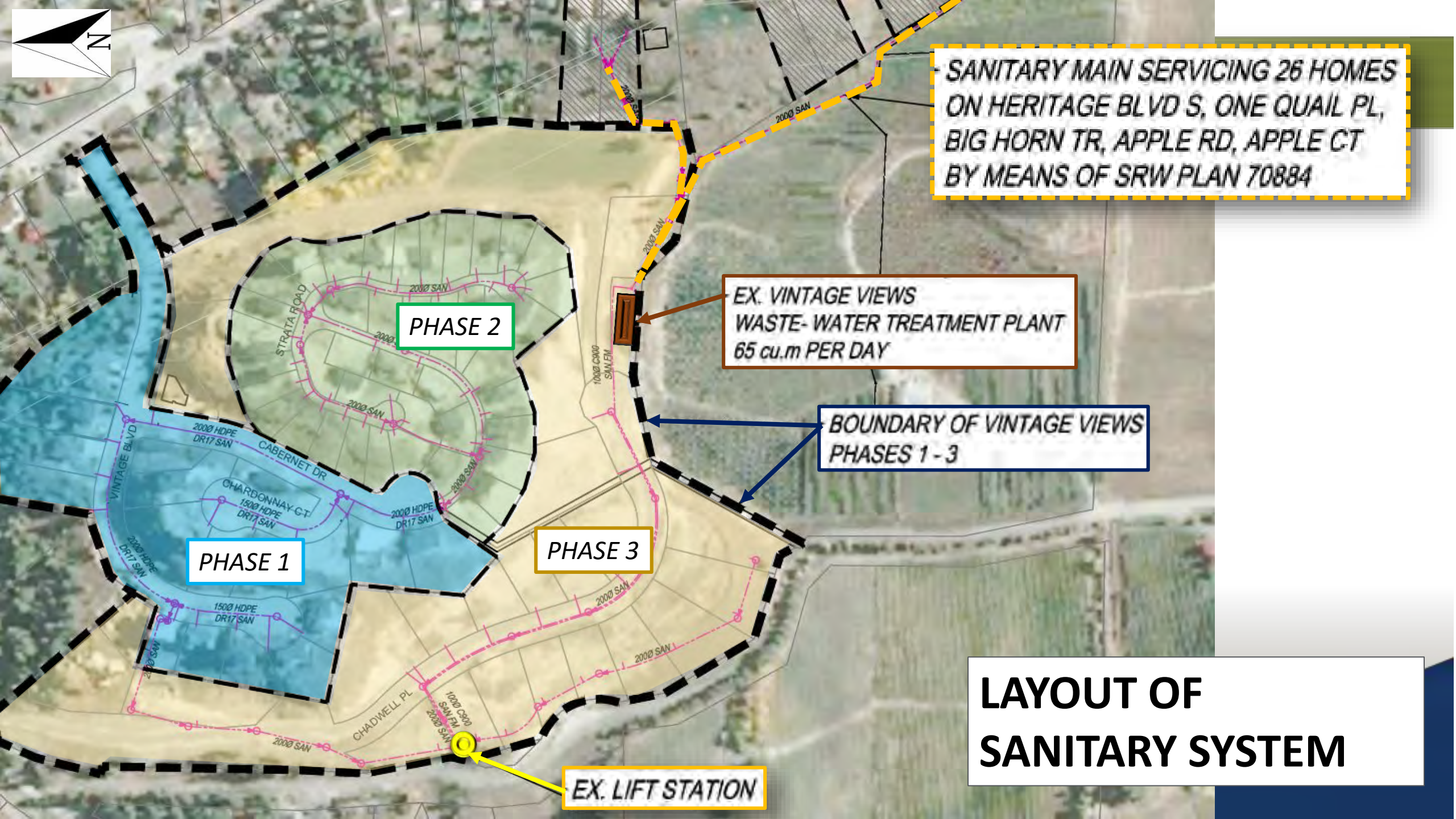
Vintage Views Sewer System

- Designed to service 112 lots at 195 m^3/d with 3 modules
- Current layout has 1 module
  - Capacity of 65 m^3/d
- Collection piping of 2417 m
- 78 lots using service

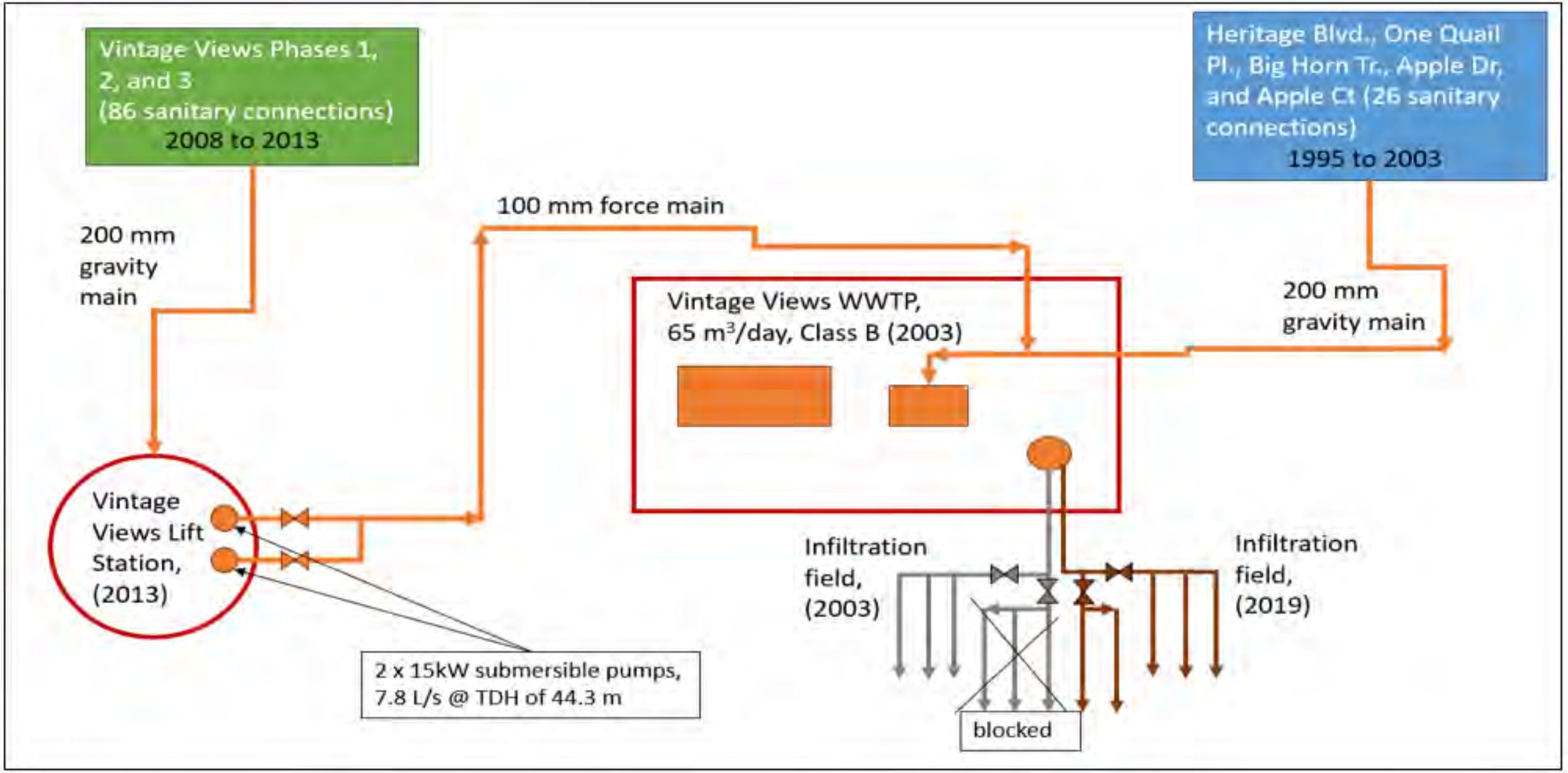


Wastewater Flow for Design

- Based on typical use calculations for 112 lots
- Assume 2.3 people per house = 257 people
- Typical wastewater generated: 450 L/capita/day
- System design flow: 116 cubic metres/day
- Current WWTP setup: 65 cubic metres/day



LAYOUT OF SANITARY SYSTEM



SCHEMATIC OVERVIEW OF THE SYSTEM

Wastewater Regulations

- *Environmental Management Act*
- Municipal Wastewater Regulation
  - Permit for effluent discharge #17170
- Re-registration required
  - Infiltration field not currently authorized
  - Process takes 2-3yrs
- No provincial oversight body for operations

Treated Effluent Quality - Requirements

Requirement	Class B
BOD_5 (mg/L)	<10
TSS (mg/L)	<10
Fecal coliforms Most probable number [MPN]/100mL	<400, if the maximum daily flow is ≥37 m^3/d
Turbidity (NTU)	n/a
Nitrogen (mg/L)	n/a
Phosphorous (mg/L)	n/a



Infiltration Field Pipe Installation

Required Monitoring by MWR

Requirement	Class B, 65 m^3/day
Flow	Twice per week
BOD and TSS	Twice per month, grab samples
Fecal coliforms	Weekly grab samples
Turbidity	None
Nitrogen total and nitrate (as N)	None

2023 Vintage Views Sewer Data

online Provincial database

2023 Data	Fecal Coliforms (cfu/100mL)	Total Coliforms (cfu/100mL)	E. coli (MPN/100 mL)
30-Jan-23	2,750	12,200	2,420
28-Feb-23	overgrown	overgrown	overgrown
30-Mar-23	38,700	overgrown	34,500
26-Apr-23	18,400	overgrown	14,800
30-Apr-23	4,670	21,000	3,700
23-May-23	86,600	overgrown	68,700
31-May-23	17,100	92,100	17,100
30-Jun-23	114,000	overgrown	114,000
14-Jul-23	155	22,800	155
31-Jul-23	38,800	173,000	38,800
16-Oct-23	9,260	68,700	9,260
30-Nov-23	1,860	12,500	1,860
8-Dec-23	106	3,590	106

Membrane Filtration



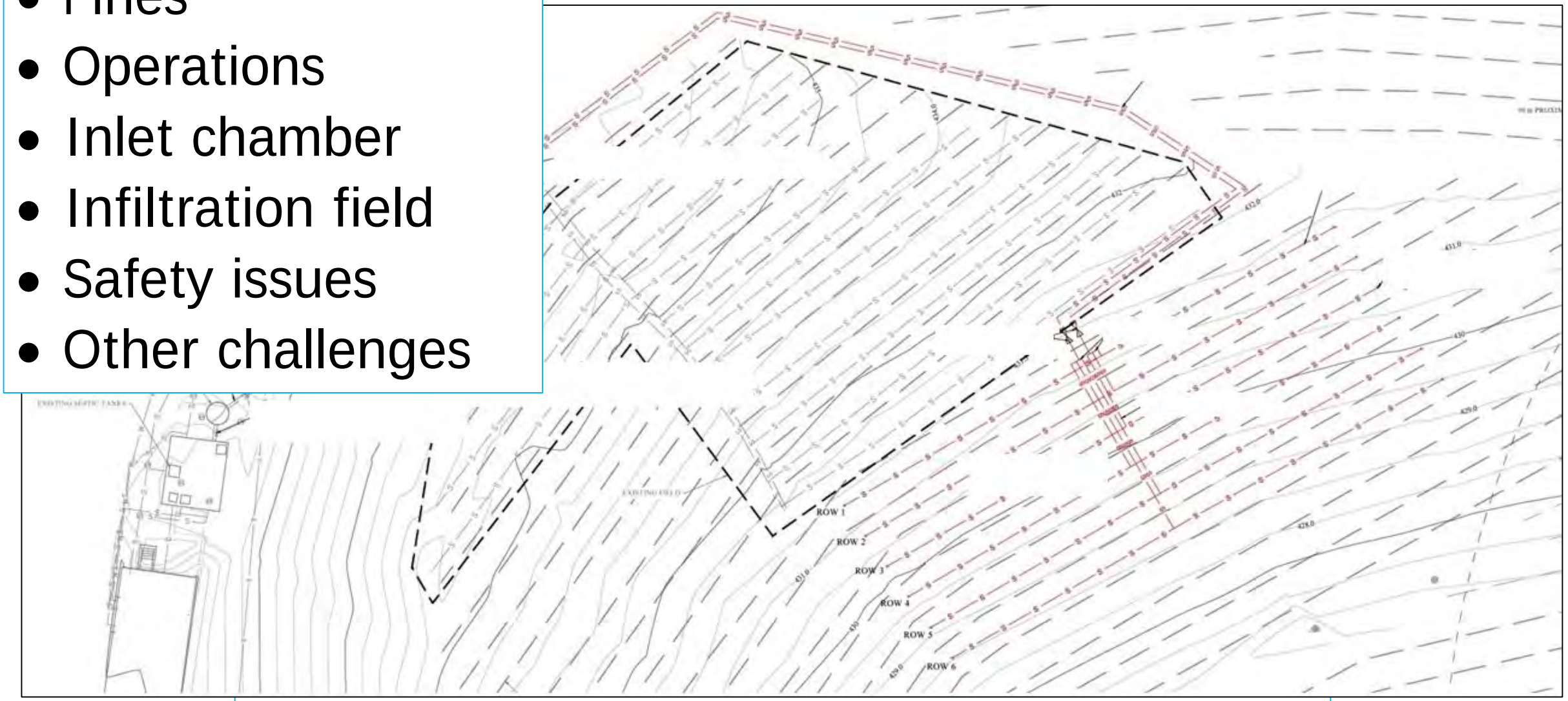
Disinfection





What is needed to achieve the discharge standards?

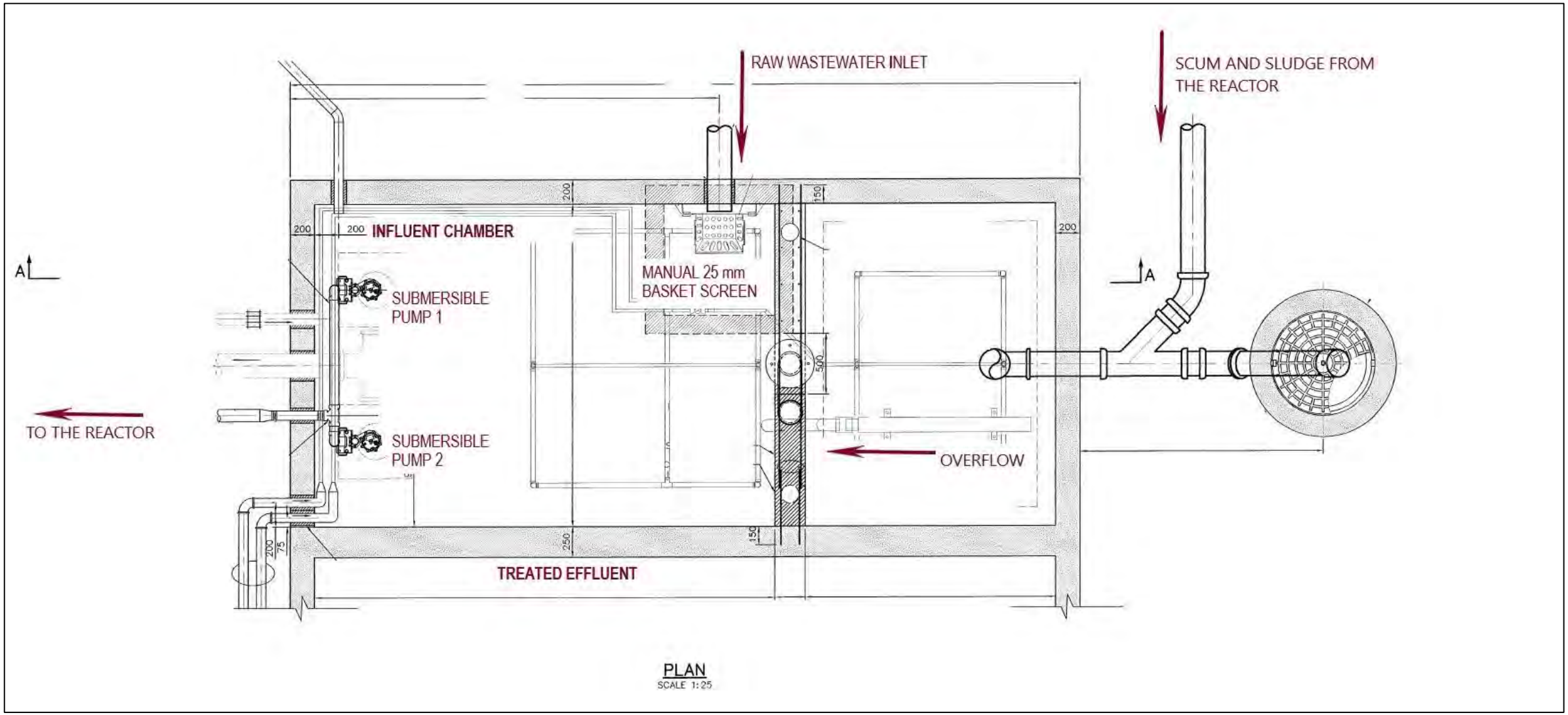
- Fines
- Operations
- Inlet chamber
- Infiltration field
- Safety issues
- Other challenges



What are the other issues with the WWTP?



- SCADA, communications
- EOCP certification
- Record keeping
- Sampling



INLET CHAMBER



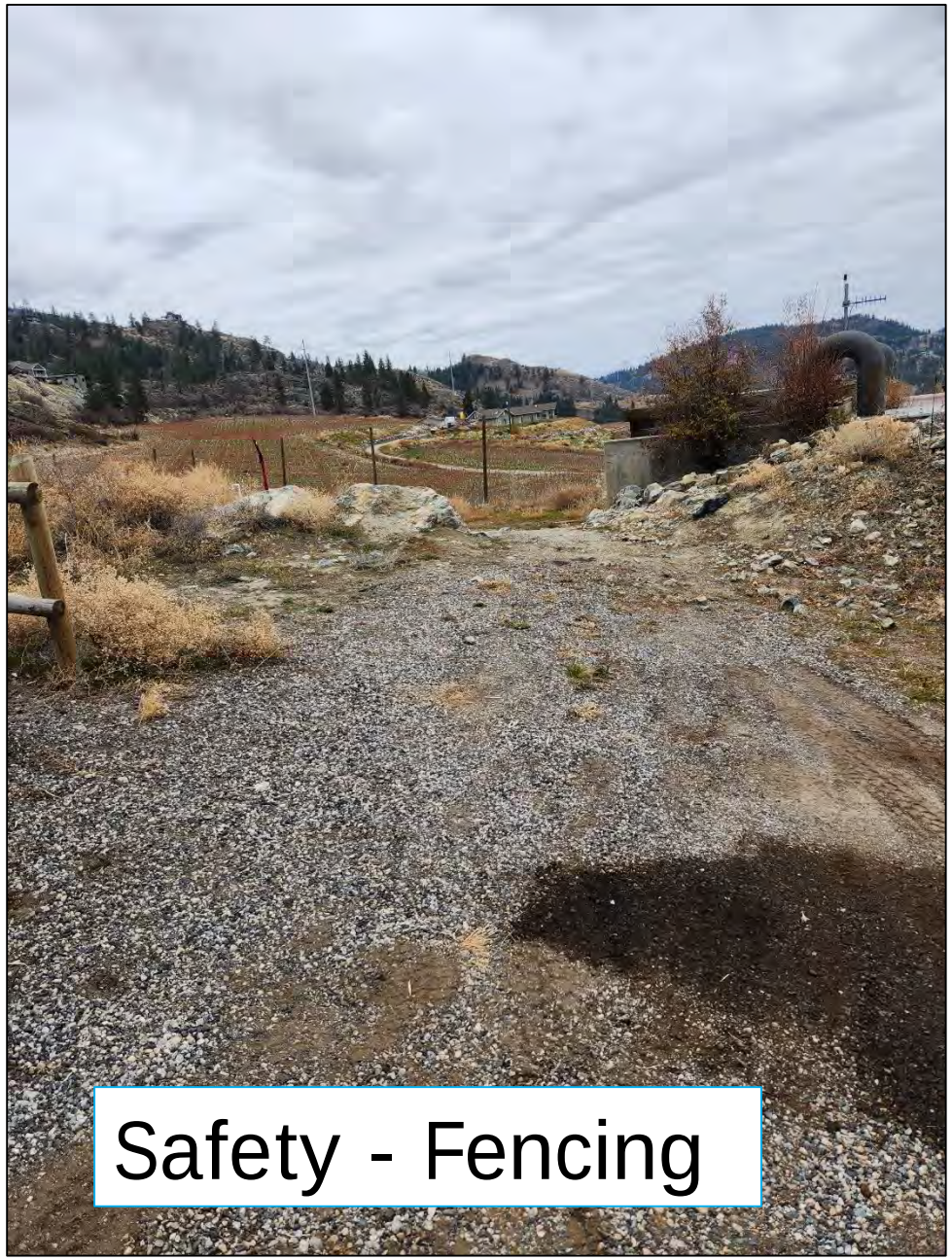




Typical Screening of Influent Flow

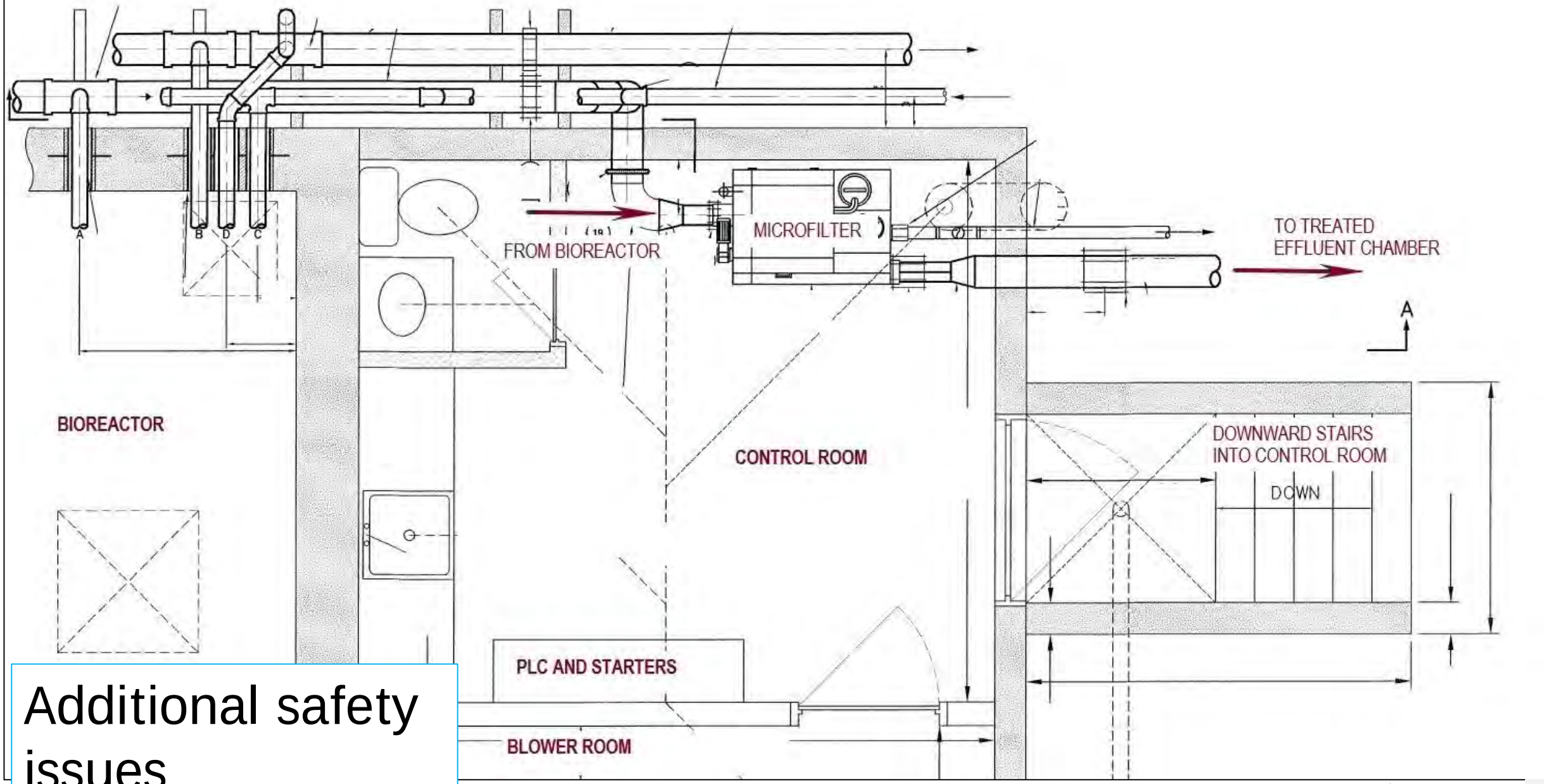


INFILTRATION FIELD

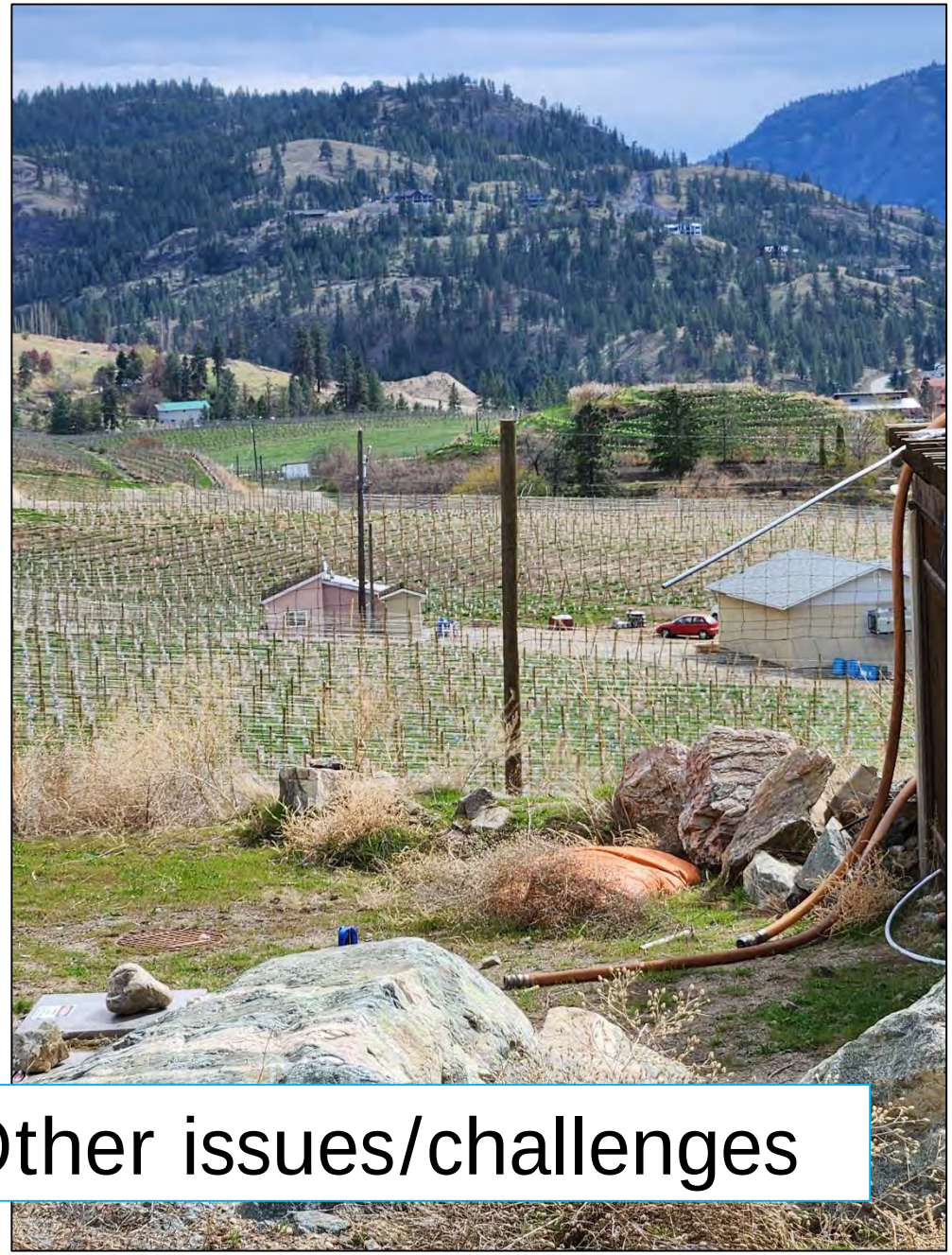


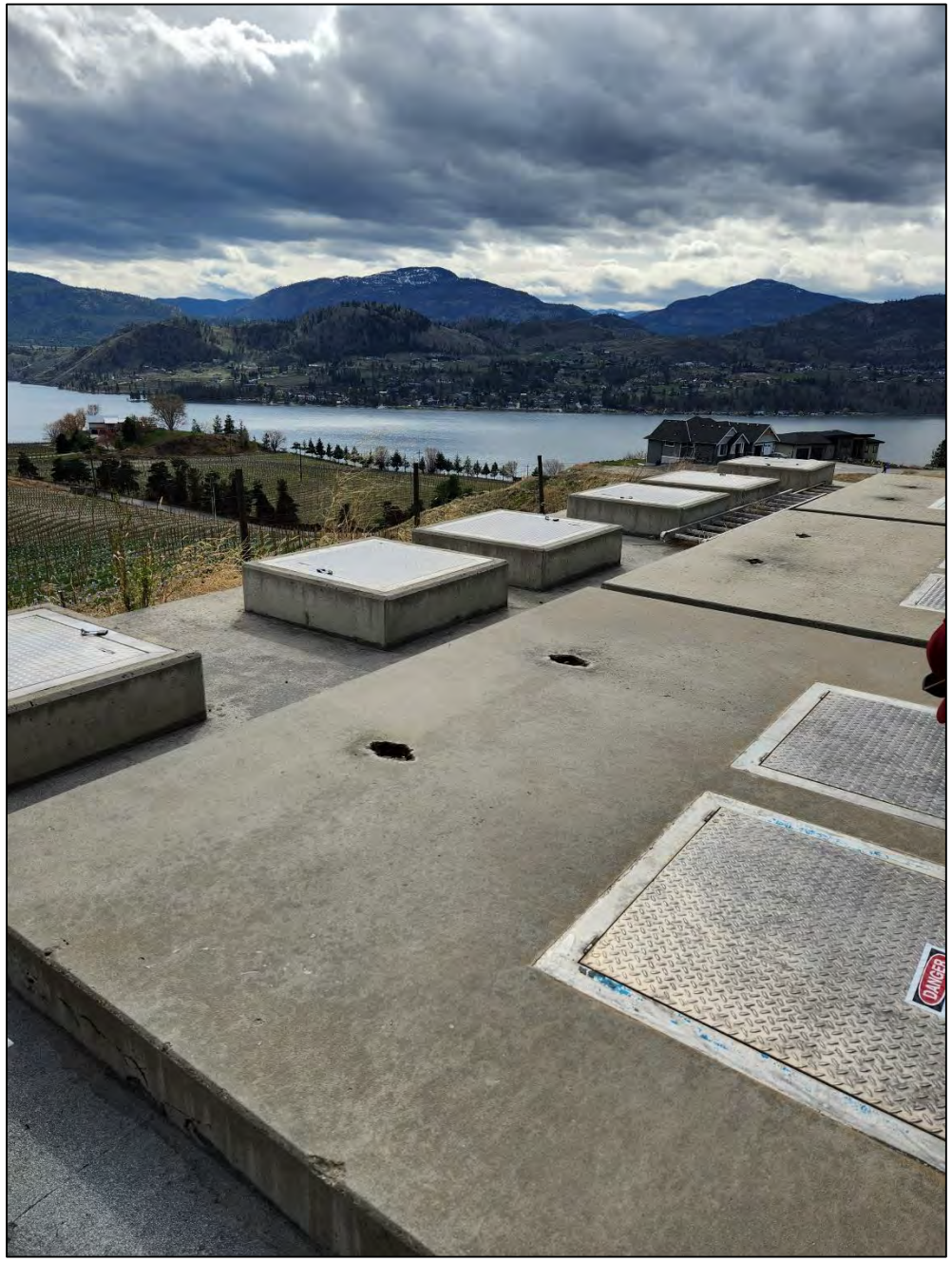
Safety - Fencing





Additional safety issues





Other issues/challenges

Empty Lots

Phase 1 : 3 lots

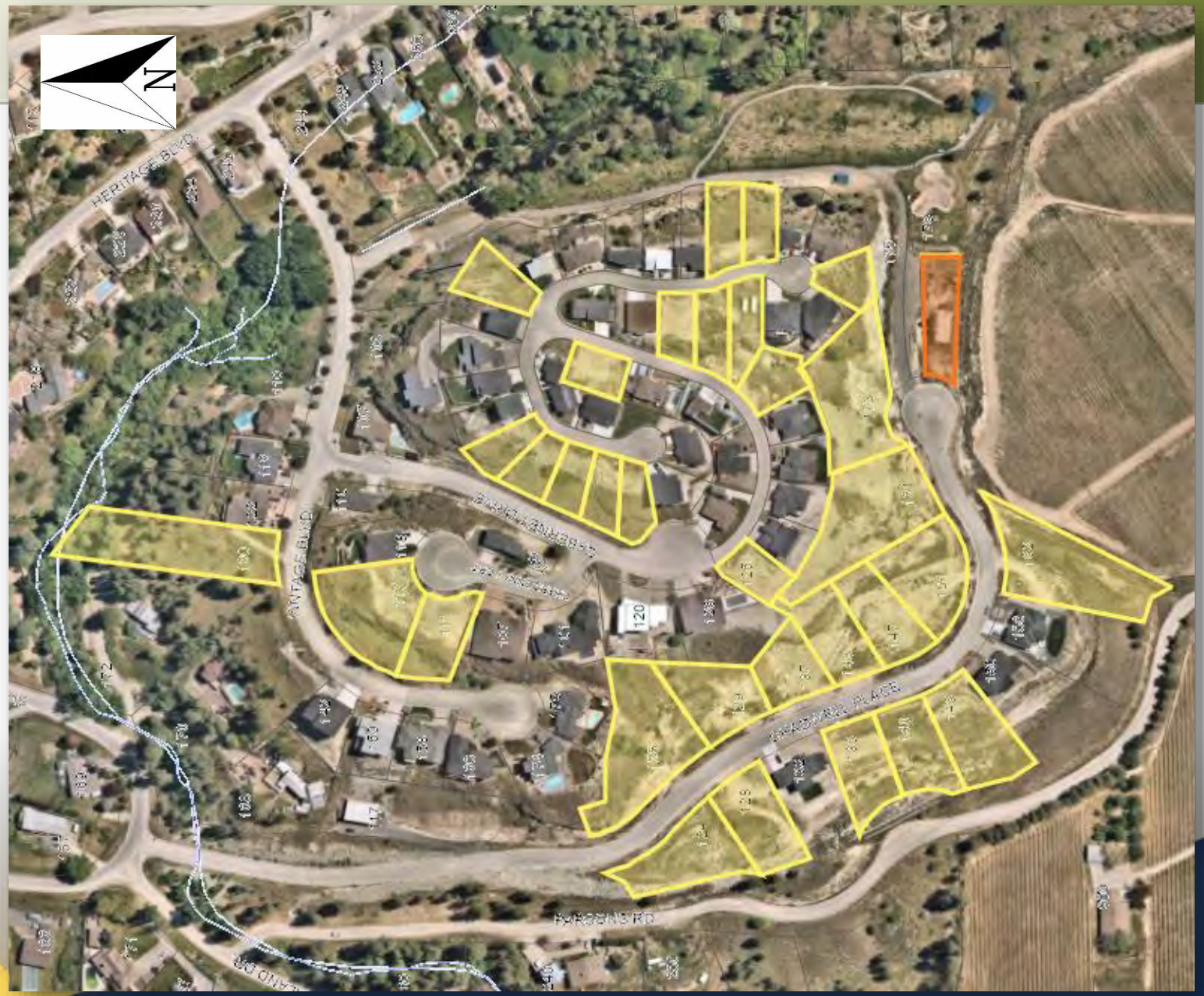
Phase 2: 15 lots

Phase 3: 14 lots

Apple Ct area: 2 lots

Empty Lot Total: 34

No Building Permits



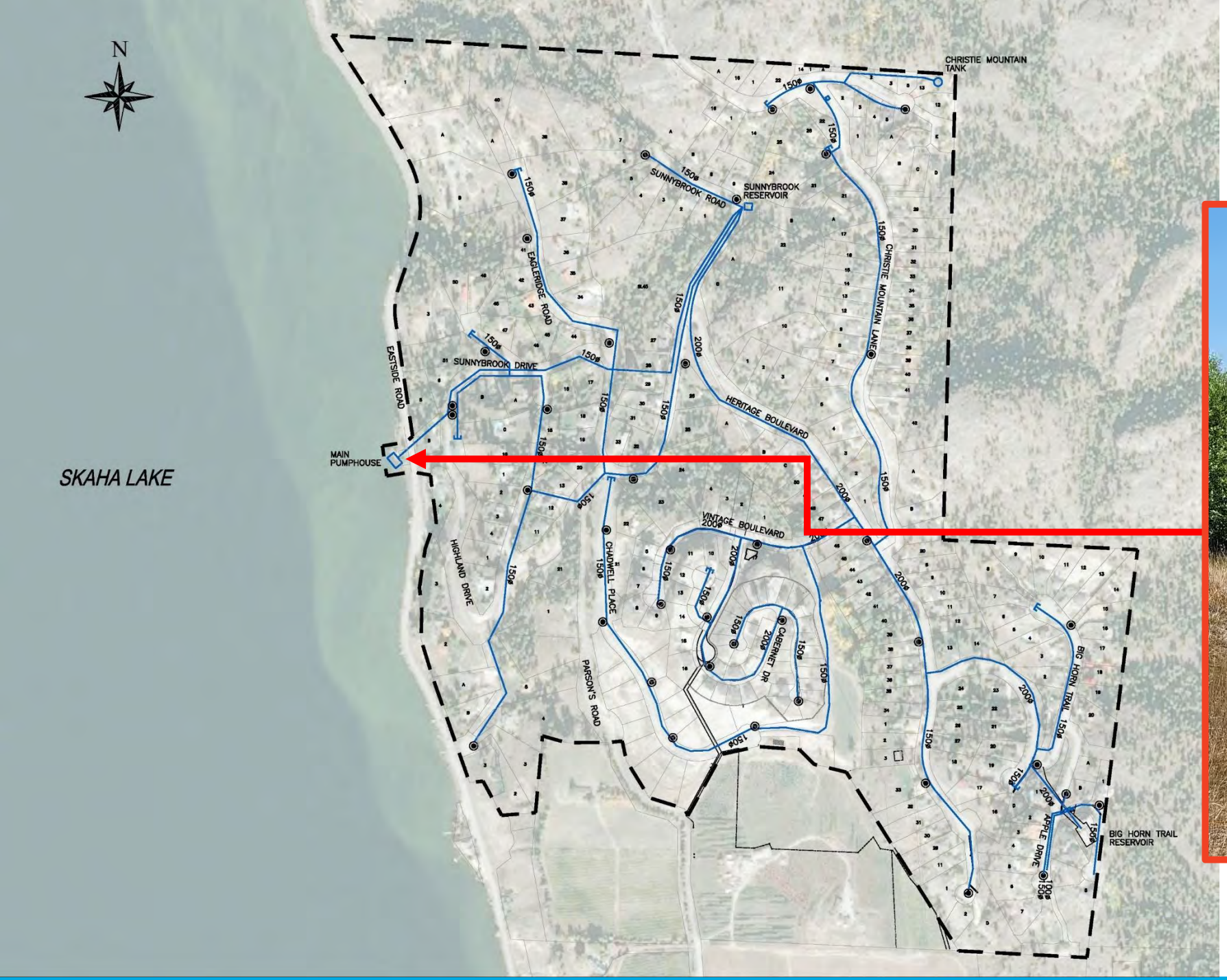


Assessments of the Lakeshore Water System

Regulations

- *Water Sustainability Act*
  - Comptroller of Water Rights
  - Operating under a Certificate of Public Convenience and Necessity (CPCN)
- *Drinking Water Protection Act*
  - Water quality and treatment requirements
- IHA monitors the ongoing operations

SYSTEM OVERVIEW: Lakeshore Pumphouse

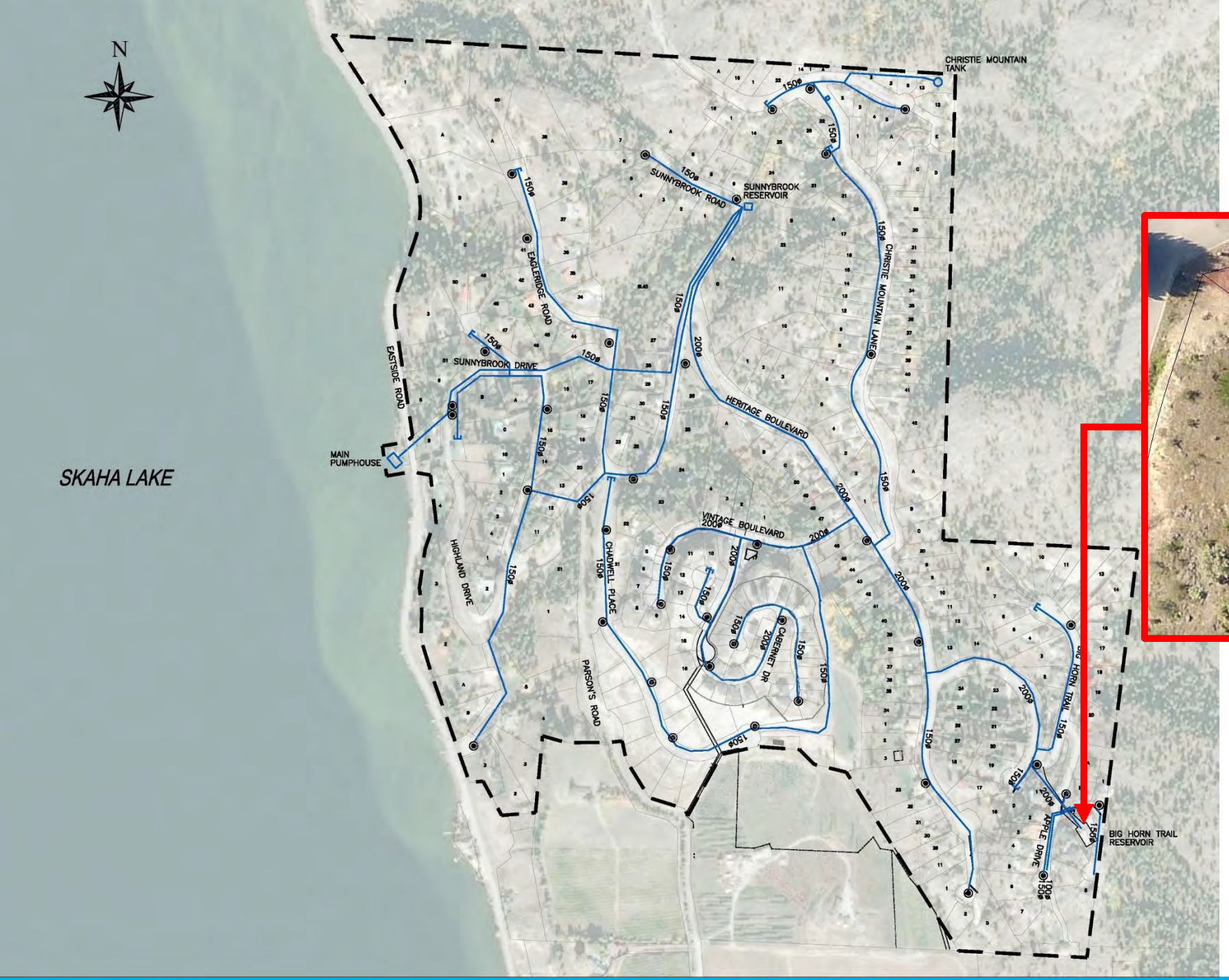




SYSTEM OVERVIEW: Sunnybrook PH & Reservoir

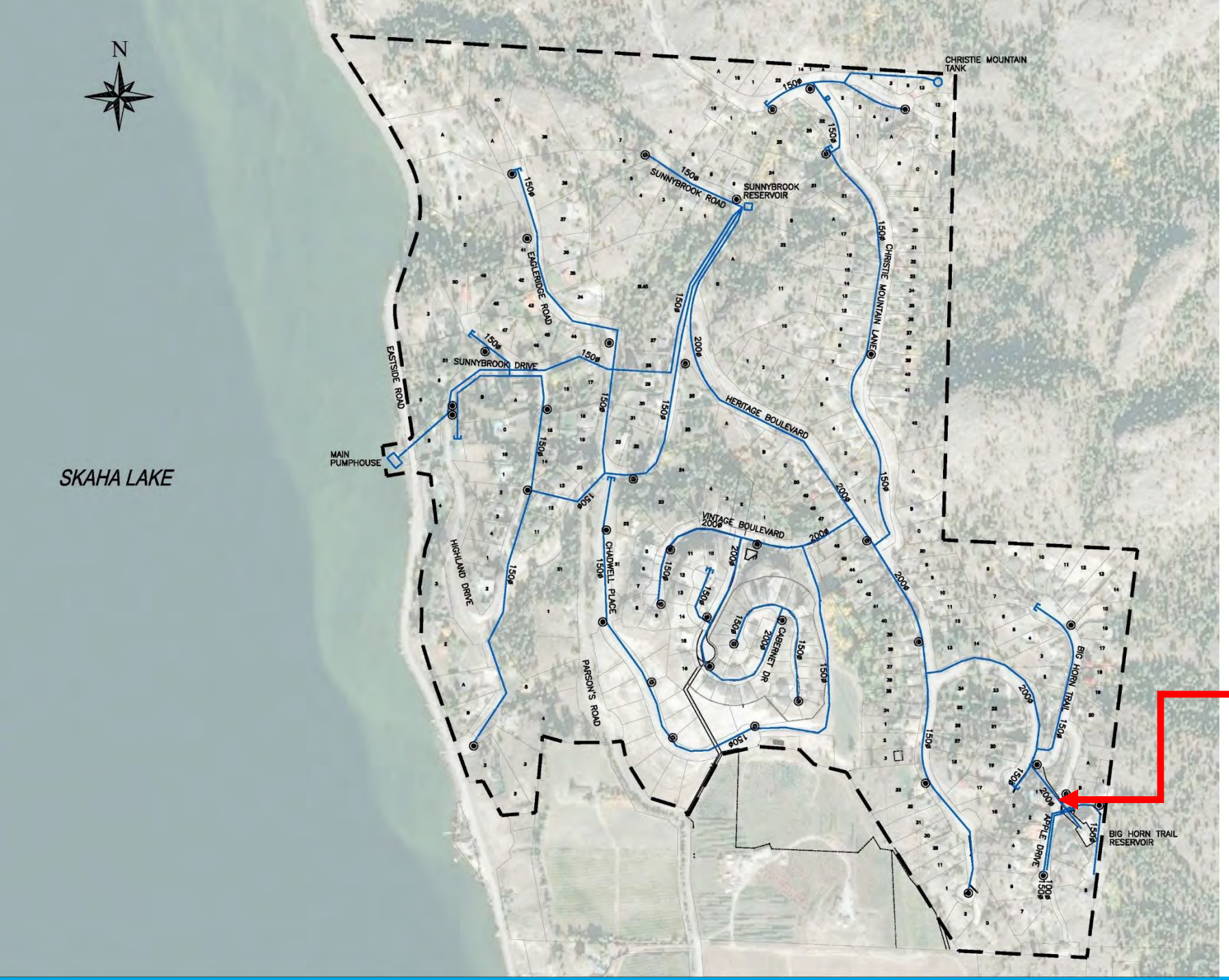


SYSTEM OVERVIEW: Big Horn Trail/Apple Court Reservoir





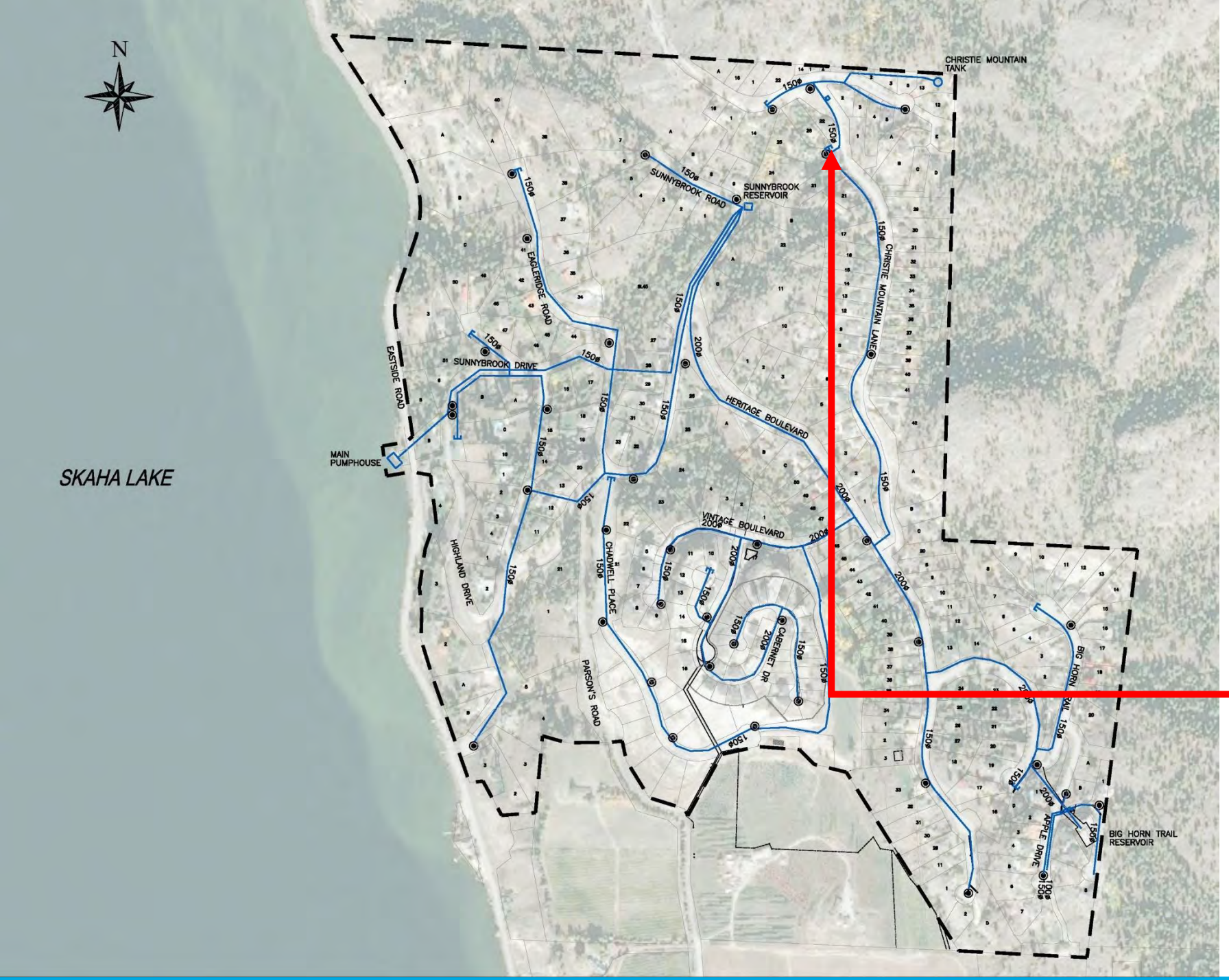
SYSTEM OVERVIEW: Apple Court Pump House

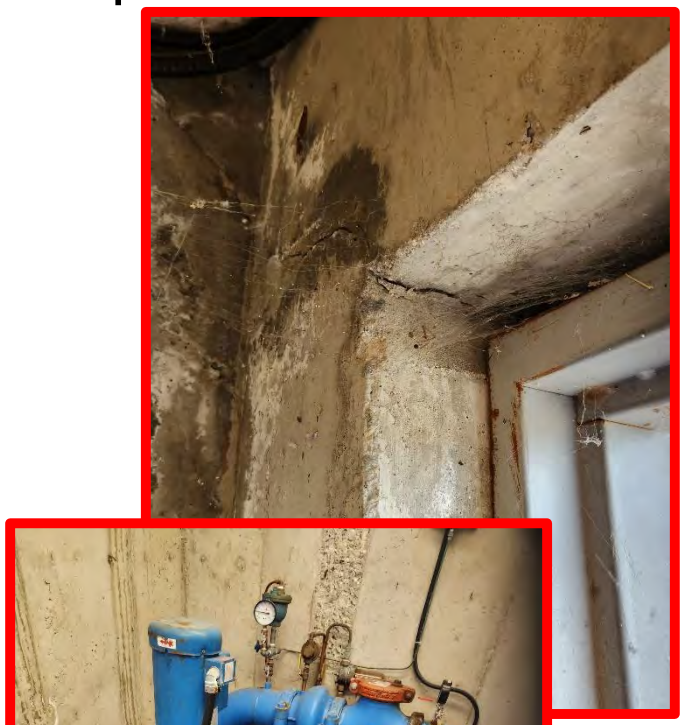






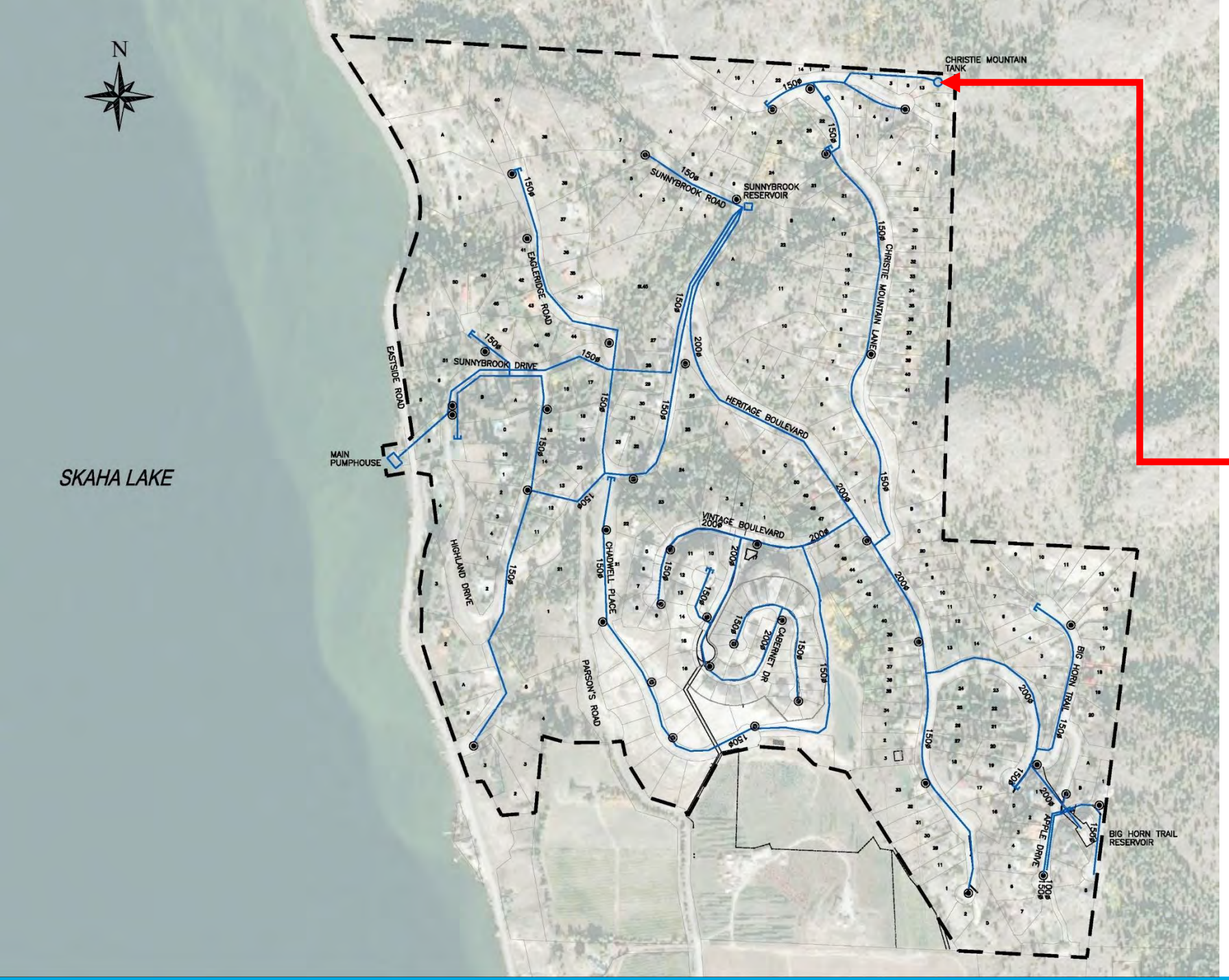
SYSTEM OVERVIEW: Christie Mountain Pumphouse





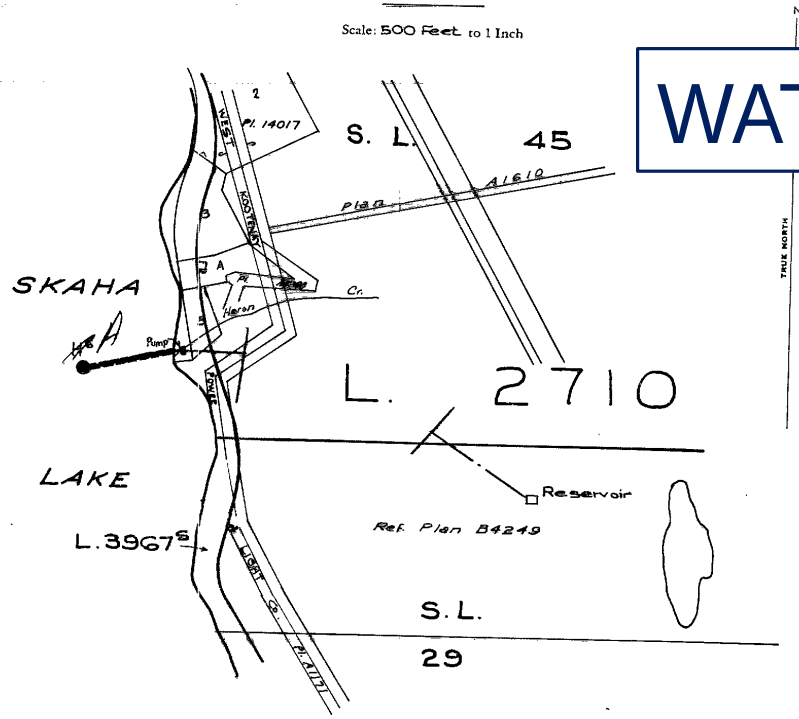


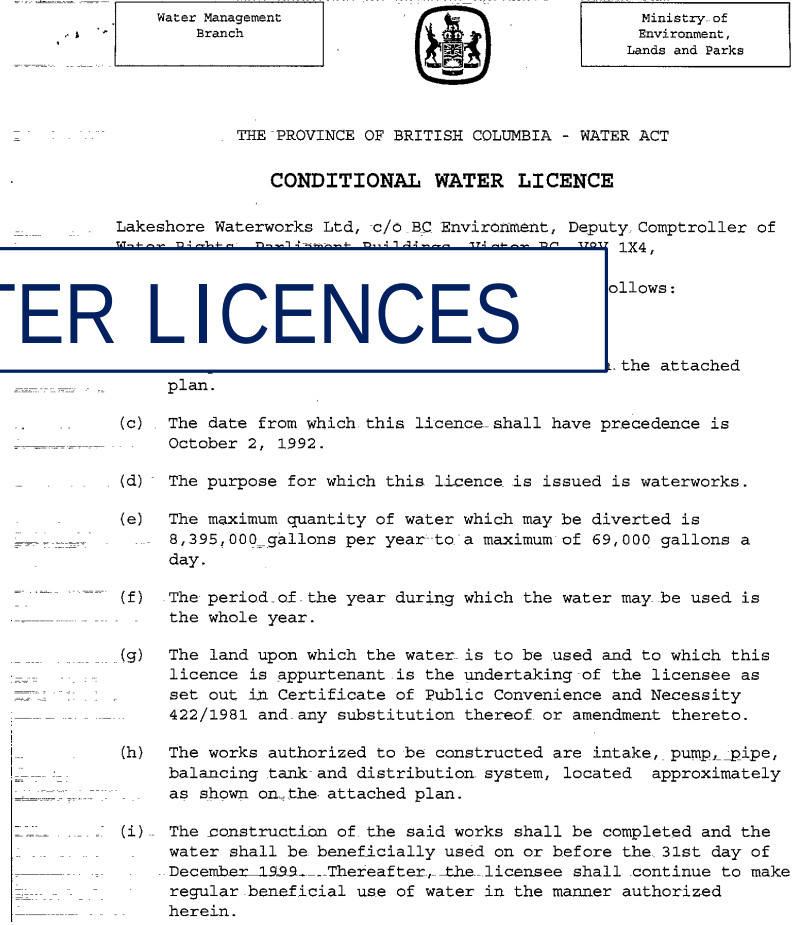
SYSTEM OVERVIEW: Christie Mountain Tank





WATER LICENCES





Water Management Branch

Ministry of Environment, Lands and Parks

THE PROVINCE OF BRITISH COLUMBIA - WATER ACT

CONDITIONAL WATER LICENCE

Lakeshore Waterworks Ltd, c/o BC Environment, Deputy Comptroller of Water Rights, Parliament Buildings, Victoria BC, V8V 1X4,

...ollows:

...the attached plan.

(c) The date from which this licence shall have precedence is October 2, 1992.

(d) The purpose for which this licence is issued is waterworks.

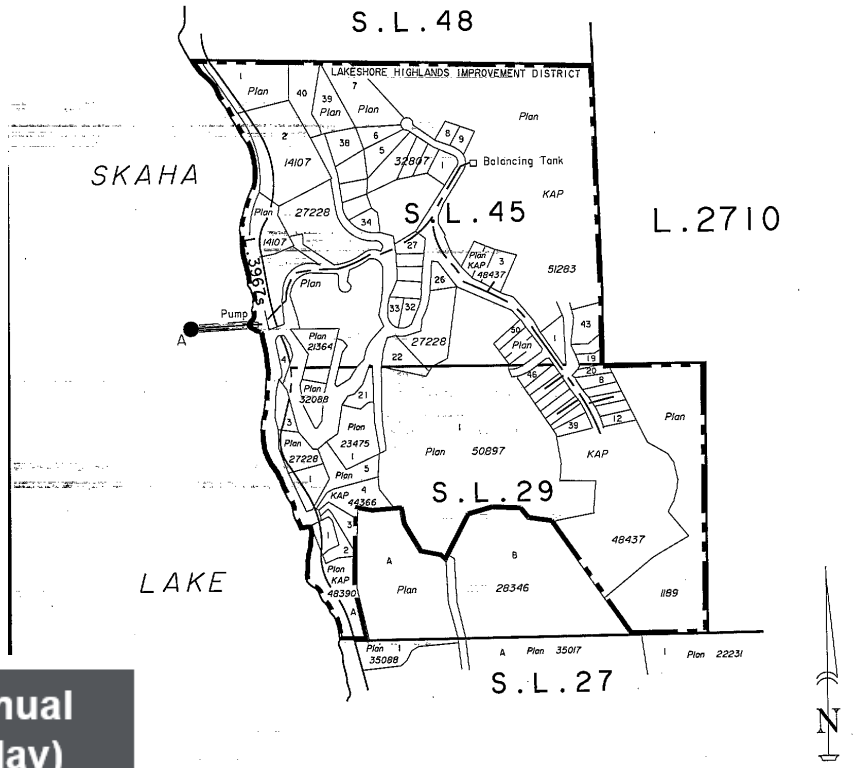
(e) The maximum quantity of water which may be diverted is 8,395,000 gallons per year to a maximum of 69,000 gallons a day.

(f) The period of the year during which the water may be used is the whole year.

(g) The land upon which the water is to be used and to which this licence is appurtenant is the undertaking of the licensee as set out in Certificate of Public Convenience and Necessity 422/1981 and any substitution thereof or amendment thereto.

(h) The works authorized to be constructed are intake, pump, pipe, balancing tank and distribution system, located approximately as shown on the attached plan.

(i) The construction of the said works shall be completed and the water shall be beneficially used on or before the 31st day of December 1999. Thereafter, the licensee shall continue to make regular beneficial use of water in the manner authorized herein.



DISTRICT : PENTICTON
NCT : PENTICTON
DISTRICT : SIMILKAMEEN DIV. OF YALE
D
Signature:
Date: February 6, 1996
1:10 000
Diversion
ber : WR 82.E.033.3.3
ver Crown Land :
C.L. 105487
File 8001929
P.C.L. 21855

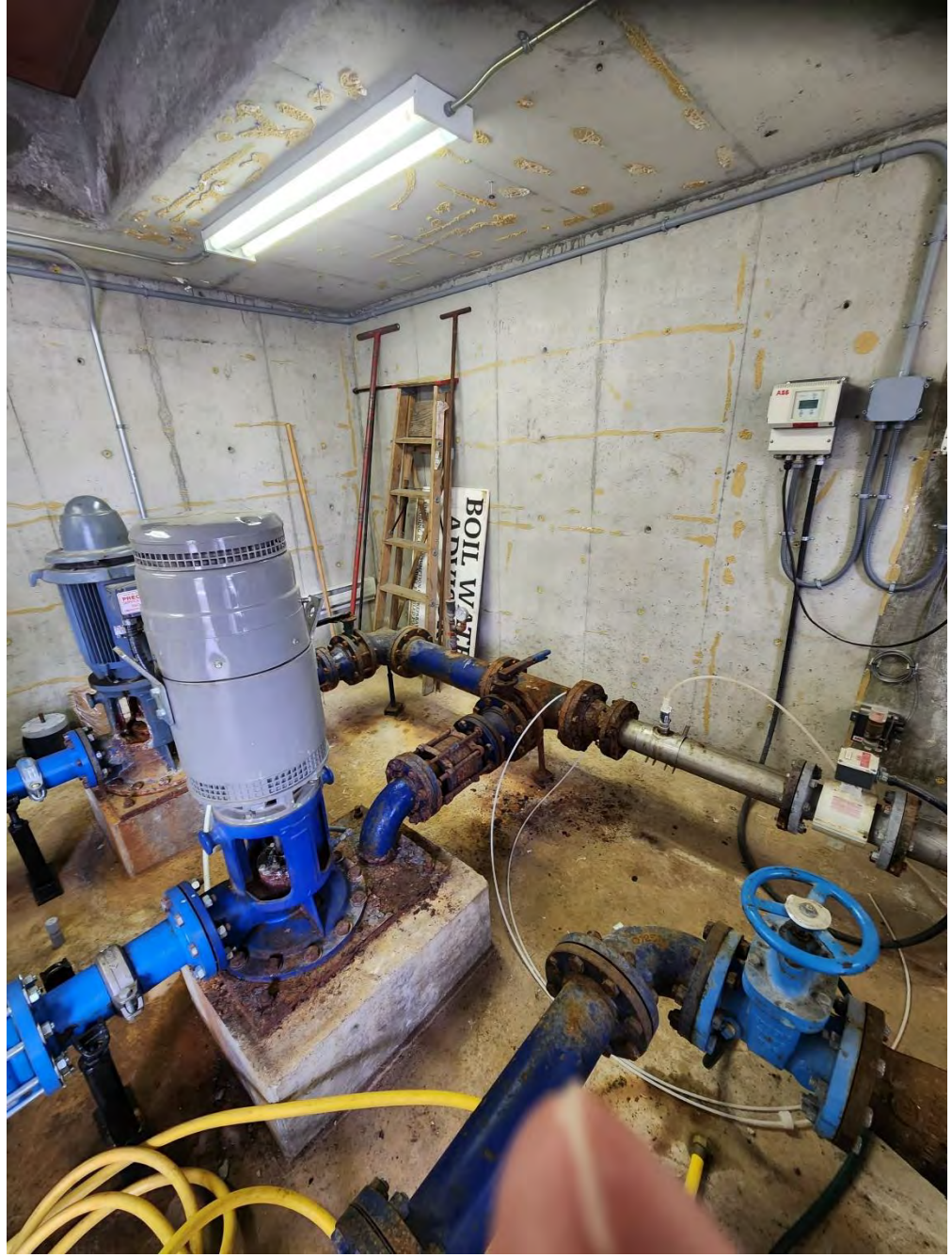
Licence Number	Date Issued	Maximum Daily Volume (m^3/day)	Maximum Annual Volume (m^3/day)
C047163	15 November 1976	97	
C060448	3 December 1984	17	
C105487	8 February 1996	261	
C107476	29 April 1996	250	83
C117063	22 May 2002	1,628	452
Total		**2,253**	

PUMPING CAPACITY

Description	Required Capacity (L/s)	Modeled Capacity (L/s)
Lakeshore Pumphouse	28.8	40.9
Sunnybrook Pumphouse	21.9	13.3
Apple Court Pumphouse	1.3	9.5
Christie Mountain	7.0*	3.2

Legend

- Meets flow rate requirements
- Does not meet flow rate requirements



FIRE DEMAND

- 60 Lps
- 302.4 m^3

- Varied flows available
  - Between 30 Lps to 100 Lps
  - Apple Court: 3 Lps



- Water storage volume required:
  - Fire volume = 302 m^3
  - Balancing volume = 622 m^3
  - Emergency storage = 231 m^3
  - Total Required Volume = 1,156 m^3

- Provided:
  - Sunnybrook Reservoir = 113 m^3
  - Apple Court = 573 m^3
  - Christie Mountain Tank = 250 m^3
  - Total Provided = 936 m^3

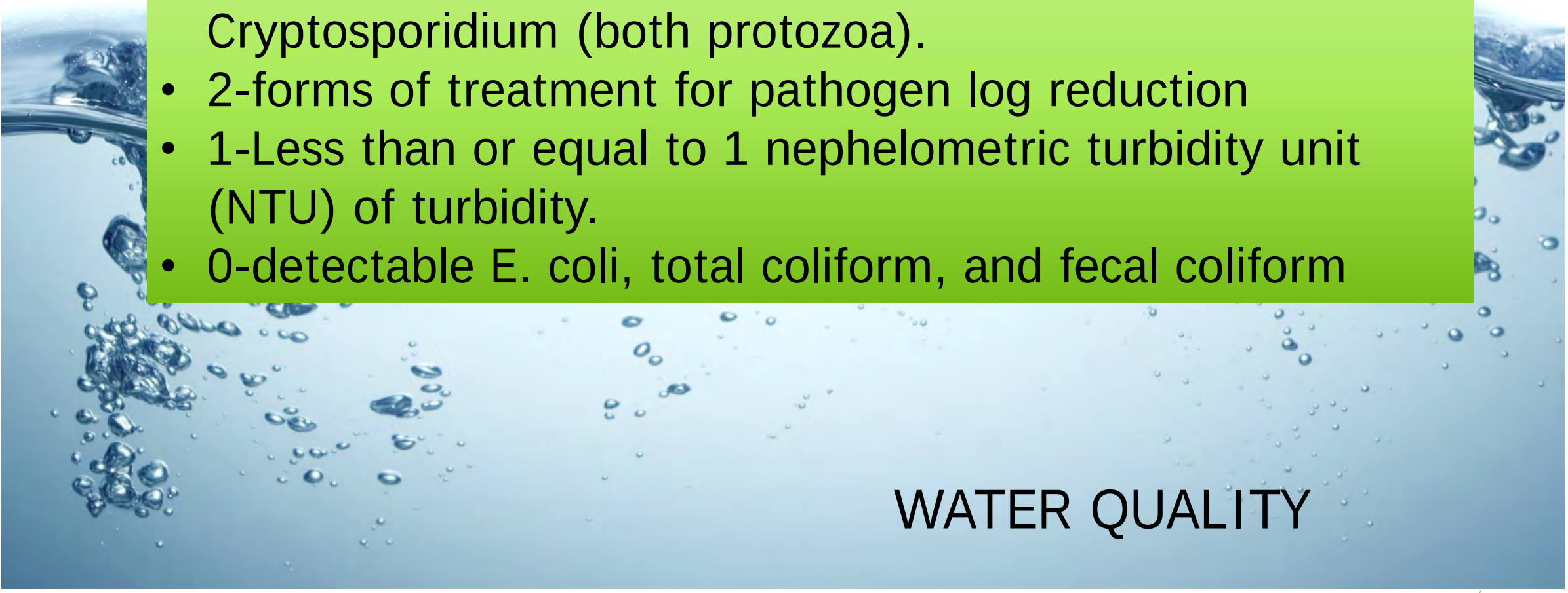


- Deficit = 220 m^3

WATER STORAGE TANKS AND RESERVOIRS

BC Drinking Water Treatment Objectives (November 2015)

- 4-log (99.99 percent) reduction of enteric viruses.
- 3-log (99.9 percent) reduction of Giardia and Cryptosporidium (both protozoa).
- 2-forms of treatment for pathogen log reduction
- 1-Less than or equal to 1 nephelometric turbidity unit (NTU) of turbidity.
- 0-detectable E. coli, total coliform, and fecal coliform





WATER TREATMENT PLANT

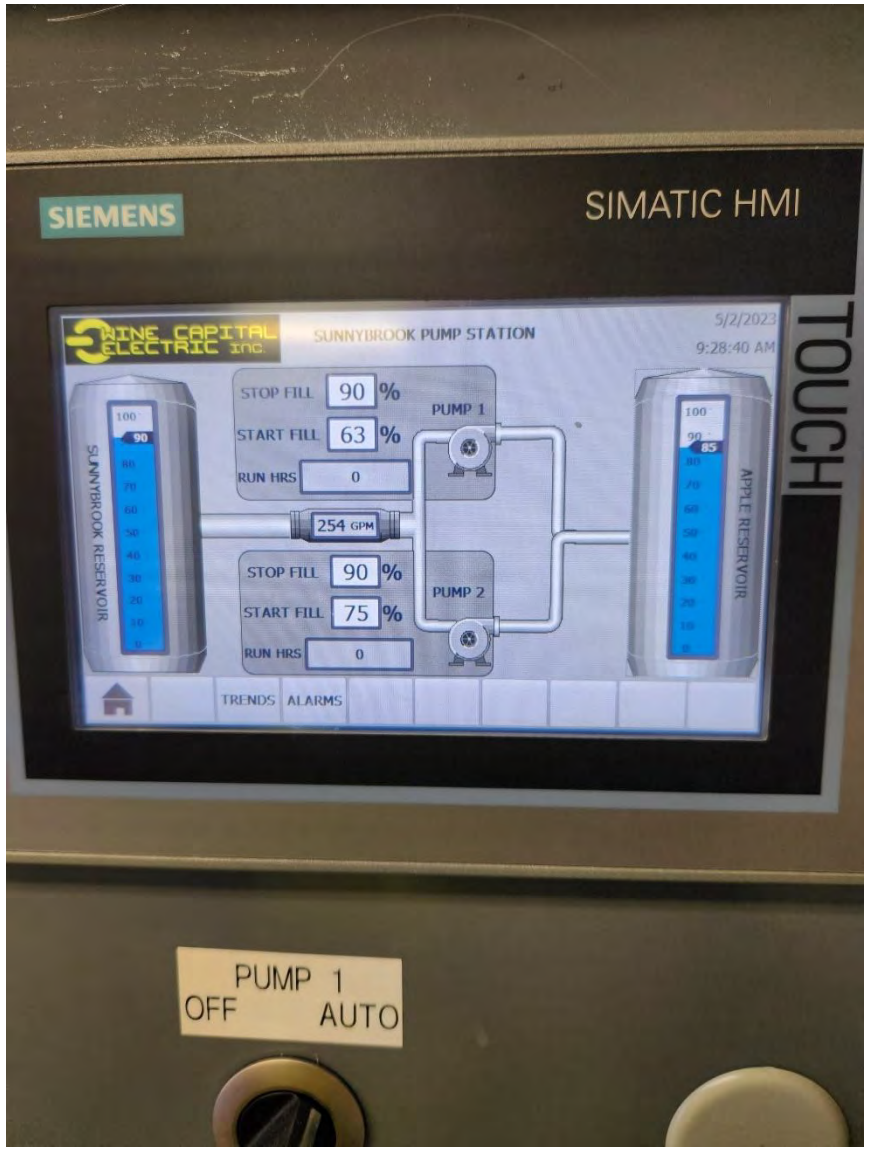
Condition of the existing infrastructure





Electric, control, and instrumentation engineering upgrades





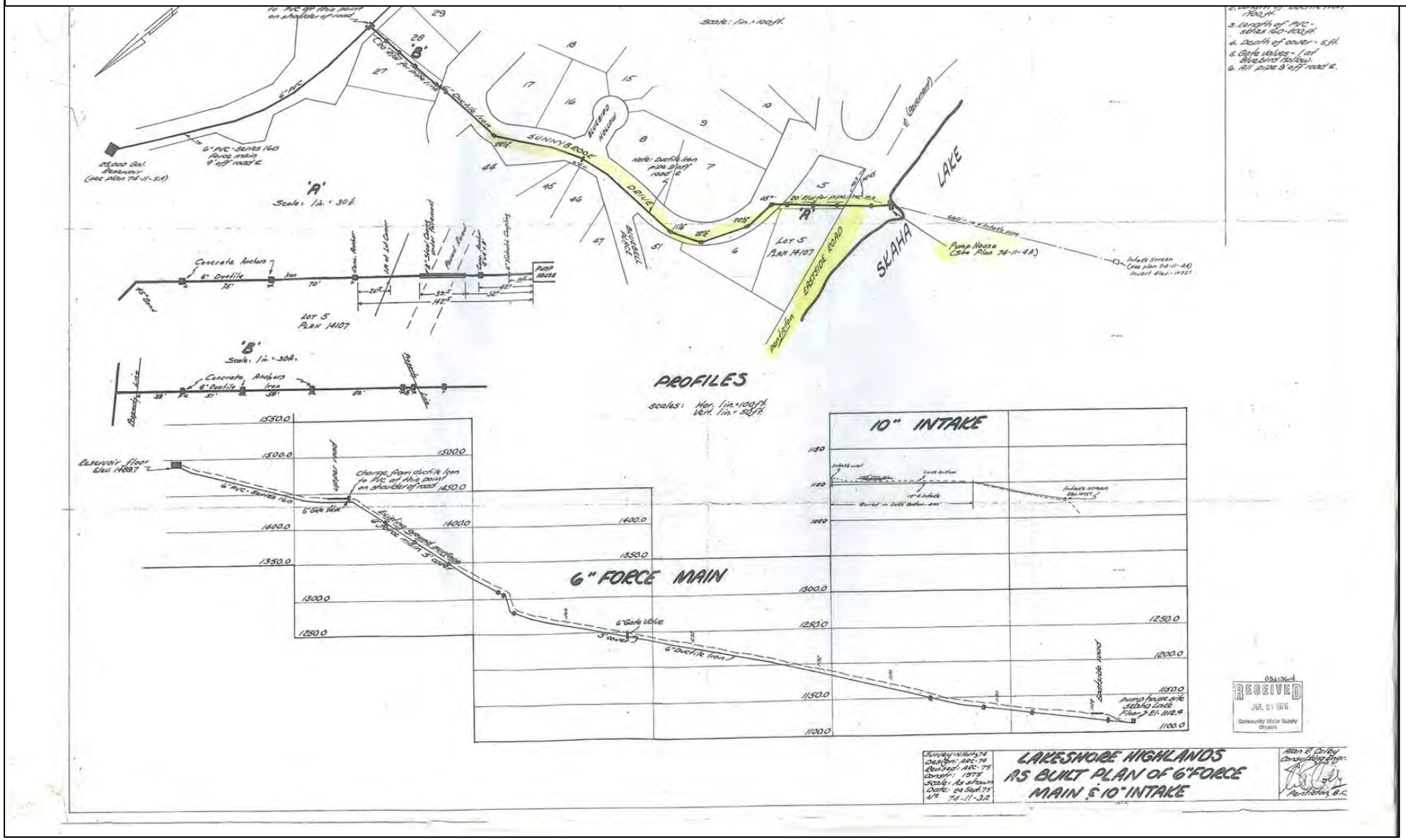
VT Scada

Additional Projects:
Christie Mountain PRV & Pumphouse Building





Additional Projects:
Pumping Main from Lakeshore Pumphouse



Additional Projects:
Christie Mountain Reservoir and Access Road



Additional Projects:
PRV Station Required at Sunnybrook Reservoir



Additional Projects:
Generators required for Pumphouses



Additional Projects:
Water Meters



Costs for System Upgrades

- Vintage Views Sewer System
- Lakeshore Waterworks
- Borrowing amounts [high estimates]
- Actual costs will vary due to:
  - Labor rates
  - Material prices
  - Specific design choices

Wastewater Initial Capital Costs

- Required to meet safety, regulatory and operational standards
- Costs do not include ongoing asset replacement as infrastructure ages
  - Pipe network – about 50-60 years remaining
  - Liftstation – 15-20 years remaining



Estimated Value of Wastewater System

Year	Description of Asset	Estimate for 2023 Construction Costs	Depreciation based on age of asset	Estimated Current Value
2003	WWTP	$ 1.33 M	$ 953 k	$ 381 k
2008	Phase 1 pipe network	$ 260 k	$ 51 k	$ 209 k
2010	Phase 2 pipe network	$ 420 k	$ 72 k	$ 348 k
2016	Phase 3 pipe network & LS	$ 855 k	$ 172 k	$ 683 k
	Totals	$ 2.87 M	$ 1.25 M	**$ 1.62 M**

Wastewater Capital Upgrades Required

Project	Estimated Cost	When Required
Hydrogeological study for new Infiltration Field	$ 75 k	ASAP
Safety and operational upgrades (fencing, SCADA, security, electrical, etc)	$ 325 k	ASAP
WWTP upgrade options analysis and designs for construction	$ 100 k	ASAP
Construction of new infiltration field	$ 500 k	Year 2
Upgrading WWTP Construction	$ 5.2 M	Year 4
Project Costs (within 4-5 years)	**$ 6.2 M**	

Wastewater Capital Upgrades Required

BORROWING FOR WASTEWATER UPGRADES	
Estimated Funds required	$ 6.2 M
Borrowing for 25 years – **NO GRANTS**	
Annual debt & interest payment (4.38%)	$ 426,550
Number of properties	112
Annual DEBT Cost per Property for 25 years	**$ 3,800**
OR One time cost per Property	**$ 55,400**

Water Initial Capital Costs

- Required to meet safety, regulatory and operational standards
- Costs do not include ongoing asset replacement as infrastructure ages
  - Pipe network – about 10-50 years remaining
  - Pump stations – 15-20 years remaining
  - Reservoirs – 20-30 years remaining

Current Value of Water System

Year	Description of Asset	Estimate for 2023 Construction Costs	Depreciation based on age	Estimated Current Value
1976	Lake pumphouse and intake pipe	$ 2.09 M	$ 1.96 k	$ 130 k
Multi	Reservoirs (3)	$ 2.73 M	$ 1.45 M	$ 1.28 M
Multi	Pipe network (10.3 km)	$ 5.07 M	$ 2.92 M	$ 2.15 M
Multi	Pumphouses (3)	$ 4.54 M	$ 3.05 M	$ 1.49 M
	Totals	$ 14.43 M	$ 9.38 M	**$ 5.05 M**

Capital Upgrades Required

- Remedial workplace safety
- Structural assessment of pumphouse
- SCADA, communications, analyzers and alarms
- PRV Assessments and upgrades
- Access road to storage reservoir
- Replace pumping main from lake
- Filtration & UV plant

Water Capital Upgrades Required

Project	Estimated Cost	When Required
Remedial Work – Workplace Safety	$ 380 k	ASAP
Upgrade Projects – Years 1 and 2	$ 3.1 M	Start in year 1
Upgrade Projects – Years 3 and 4	$ 9.8 M	Start in year 3
Upgrades anticipated to be complete by year 6 to 7 to achieve Regulatory and Operational Compliance		
Total Upgrade Project Cost Estimates	**$ 13.1 M**	

Water Capital Upgrades Required

BORROWING FOR WATER UPGRADES	
Estimated Funds required	$ 13.0 M
Borrowing for 25 years – **NO GRANTS**	
Annual debt & interest payment (4.38%)	$ 894,378
Number of properties	311
Annual DEBT Cost per Property for 25 years	**$ 2,880**
OR One time cost per Property	**$ 42,000**

Operational Expenses

- Wastewater System (112 connections):
  - Anticipated annual operating cost:
    - $1,600-2,400 per connection
- Water System (311 connections):
  - Anticipated annual operating cost:
    - $1,000-1,500 per connection
- Based on high level estimates

Overall Water & Sewer System Issues

- Not meeting provincial regulations
  - Provincial order for no new connections – sewer
- No capital reserves
- Multiple safety concerns
- Inconsistent record keeping
- Major upgrades required
- Very complex process with many variables

Next Steps & Schedule

- Issues being discussed with multiple parties
  - Including Province, IHA, owner, etc.
- Unknown timeline for RDOS Board decision

- All available information will be posted:
  - RDOS Regional Connections website

https://rdosregionalconnections.ca

Questions?

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General Utilities Email: Utilities@rdos.bc.ca

https://rdosregionalconnections.ca

