Ponderosa Nature Resort Water and Wastewater System Improvements

MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT STUDY

Online Public Information Centre # 3

June 23, 2022

Presentation Team

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- Senior Vice President
- Project Manager

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- Senior Environmental Lead

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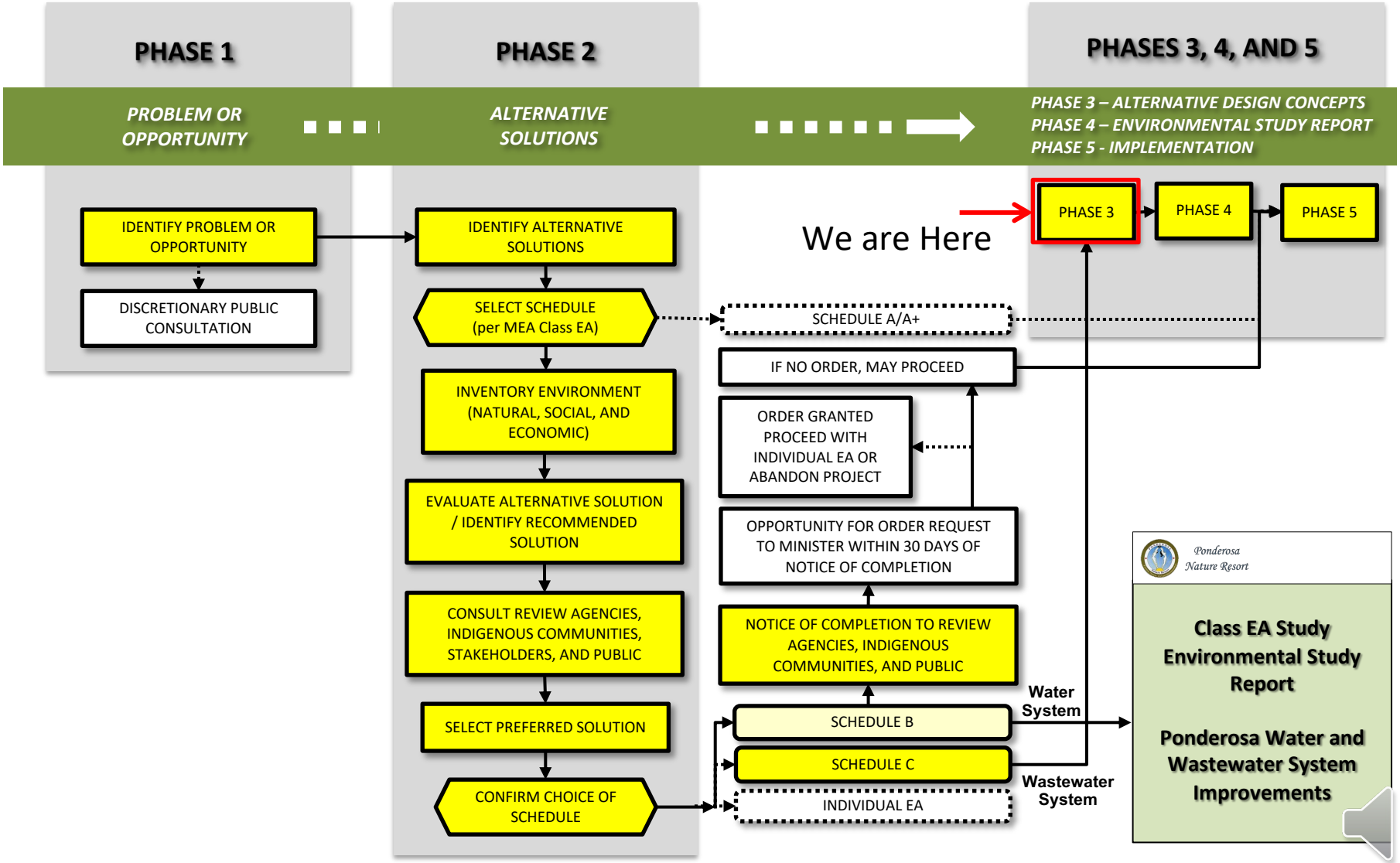
The Class Environmental Assessment Process



Purpose of the Project

- Ponderosa Nature Resort has identified an opportunity to expand.
- The Site is proposed to operate as a private year-round residential / recreational development.
- Approximately 47 additional residential units are proposed.
- A solution is required to provide water/wastewater servicing to the existing and proposed units.
- An Environmental Assessment (EA) Study is required to identify and evaluate potential alternative solutions and alternative design concepts for the Site servicing and assess the potential impacts of the proposed development.

Purpose of the Public Information Centre

The purpose of this Public Information Centre is:

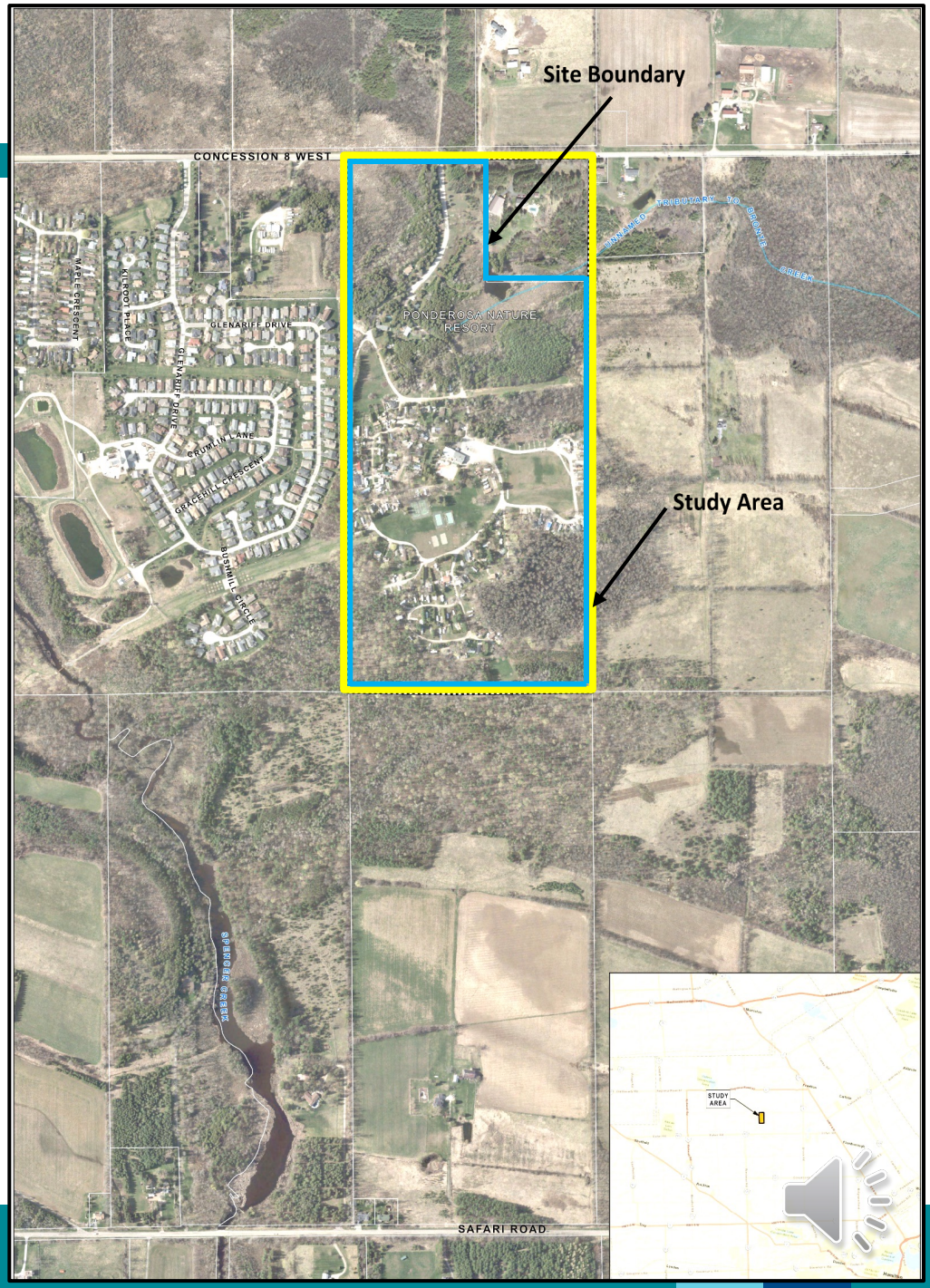
- To present the identified preferred alternative solutions and design concept
- Provide opportunity to participate and input in the planning and decision-making process
- Discuss issues or concerns public may have
- Identify next steps in the process

We will present information and request input on the following:

- Project Description and Background
- Problem / Opportunity Statement
- Explanation of the EA Process
- Alternative Solutions and Alternative Design Concept
- Preferred Alternative Solutions and Preliminary Preferred Design Concept

Study Area

- Study Area for EA includes the entire 37-hectare Site; comprised of 189 private residential units that vary from permanent structures to mobile trailer homes.
- 101 permanent units
- 88 seasonal units (including 9 guest rooms and one apartment).
- Site also includes a clubhouse containing a tavern, restaurant, indoor/outdoor pool, and spa facilities.



Project Background - Water

- Drinking water is provided to the property by four drilled wells.
- The property has a valid Permit to Take Water for a combined maximum taking of 151 litres / minute (216 m^3/day).
- Functional Servicing Report (FSR) completed in 2018 concluded no additional supply wells required if sufficient storage can be provided.
- The Study Team assessed the water system needs for the proposed expanded development as part of the EA and confirmed that no additional supply wells are required.
- Further analysis of alternative solutions for treatment and storage was considered by the Study Team.

Project Background - Wastewater

- Site wastewater servicing consists of a combination of communal sewage systems, individual sewage systems, holding tanks and leaching pits.
- Nine onsite sewage systems (septic systems) consisting of septic tanks and leaching beds provide sanitary service to some of the residential units as well as the clubhouse.
- Other residential units are serviced with either holding tanks or leaching pits.
- Wastewater collected in holding tanks is emptied by the residents at the dumping station on the site.

Problem/Opportunity Statement

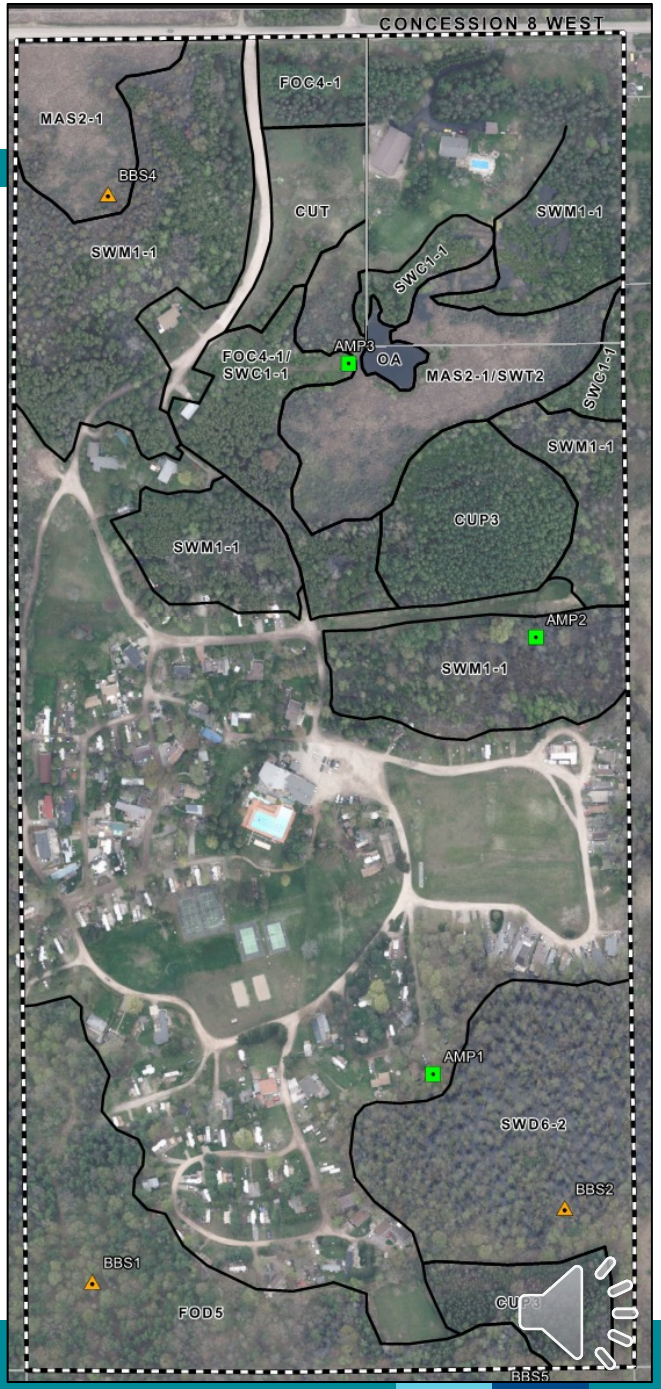
The purpose of the EA Study is to identify a preferred solution and design concept that provides a cost-effective and environmentally sound means of providing water supply, treatment and distribution and wastewater collection, treatment and discharge for Ponderosa with sufficient capacity to service existing and proposed facilities. Alternatives will be examined as part of the EA Study including the impacts of alternatives on the natural, socio-cultural, technical and economic environment.

Existing Conditions

Natural Environment

Vegetation communities were characterized using the Ecological Land Classification system at the ecosite level. Three vegetation community types were identified in the Study Area, split between eight distinct vegetation community polygons.

ELC Descriptions
CUP3: Coniferous Plantation
CUT: Cultural Thicket
FOC4-1: Fresh-Moist White Cedar Coniferous Forest
FOD5: Dry-Fresh Sugar Maple Deciduous Forest Ecosite
MAS2-1/SWT2: Cattail Mineral Shallow Marsh/Mineral Thicket Swamp complex
OA: Open Water
SWC1-1: White Cedar Mineral Coniferous Swamp
SWD6-2: Silver Maple Organic Deciduous Swamp
SWM1-1: White Cedar - Hardwood Mineral Mixed Swamp



- The Site contains sections of the Beverly Swamp Provincially Significant Wetland (PSW) Complex, which is also a headwater drainage feature for Fairchild Creek, Spencer Creek, and Bronte Creek.
- Most woodlands on the Study Area are either considered Significant Woodland or are within the required 30 m minimum vegetation protection zone (MVPZ).
- Portions of the Beverly Swamp PSW Complex are designated as Life Science Area of Natural and Scientific Interest (ANSI).

Existing Conditions

Natural Environment

Portions of the Study Area have the potential to support habitat for eight Species of Conservation Concern:

- *Avian*
  - Canada Warbler
  - Eastern Wood-pewee
  - Golden-winged Warbler
  - Wood Thrush
- *Butterflies*
  - Monarch
  - West Virginia White
- *Reptiles and Amphibians*
  - Eastern Ribbonsnake
  - Snapping Turtle

Nine SAR were assessed with potential for presence in the Study Area:

- *Avian*
  - Barn Swallow
  - Chimney Swift
  - Cerulean Warbler
  - Least Bittern
- *Flora*
  - American Chestnut
  - Butternut
- *Mammals*
  - Little Brown Myotis
  - Northern Myotis
  - Tri-colored Bat
- *Aquatic Habitat*
  - Not observed

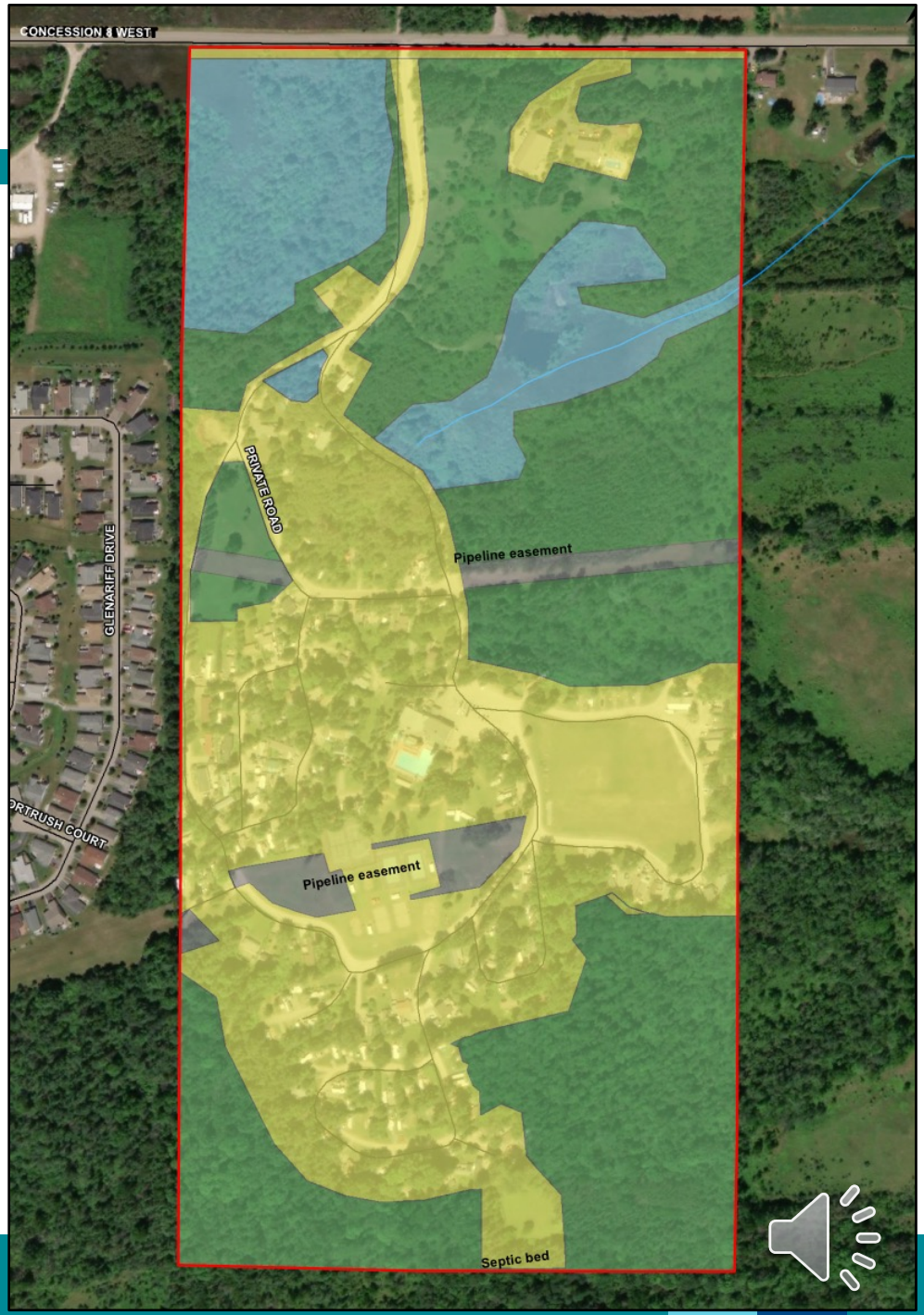
A pond is present in the Study Area and it discharges to an unnamed tributary of Bronte Creek. The pond is considered fish habitat as defined by the *Fisheries Act*.

Existing Conditions

Socio-Cultural Environment

The Stage 1 Archaeology background study determined that:

- One previously registered archaeological site is located within 1 km of the Study Area.
- Property inspection determined that parts of the Study Area exhibit archaeological potential and would require Stage 2 assessment.
- The preferred solution for wastewater system improvements will require a Stage 2 assessment.



Alternative Solutions - Water

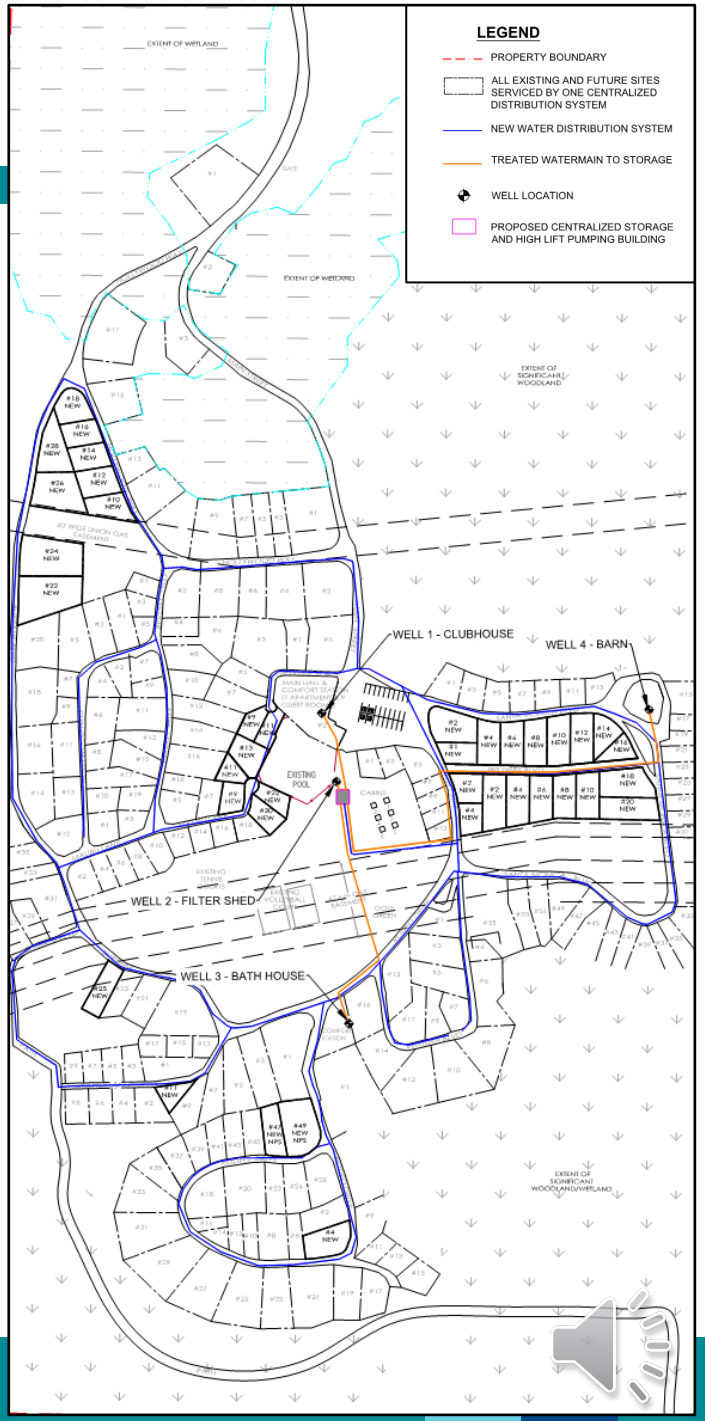
The Class EA will consider alternatives for the water servicing, which would typically include options for water supply, treatment and storage. These Alternatives are identified below:

1. Do Nothing
2. Upgrade Existing Treatment Systems and Construct Centralized Storage, High Lift Pumping and Distribution System
3. Construct New Centralized Treatment, Storage and High Lift Pumping with New Distribution System

Preferred Solution - Water

Alternative 2: Upgrade Existing Treatment Systems and Construct Centralized Storage, High Lift Pumping and Distribution System

Construction of a centralized treated water storage reservoir, high lift pumping system and new distribution system. The existing four wells and their respective treatment systems will be utilized with minor upgrades to provide potable water to the centralized storage reservoir.



Projected Wastewater Design Flows

Parameter	Value	Unit
Total Units Serviced (existing + future)	236	units
Average Flow Per Unit	250	L/unit/day
Projected Average Day Flow (rounded)	60	m^3/day
Peaking Factor (based on MECP standards)	3.0	N/A
Projected Peak Flow	180	m^3/day

Alternative Solutions - Wastewater

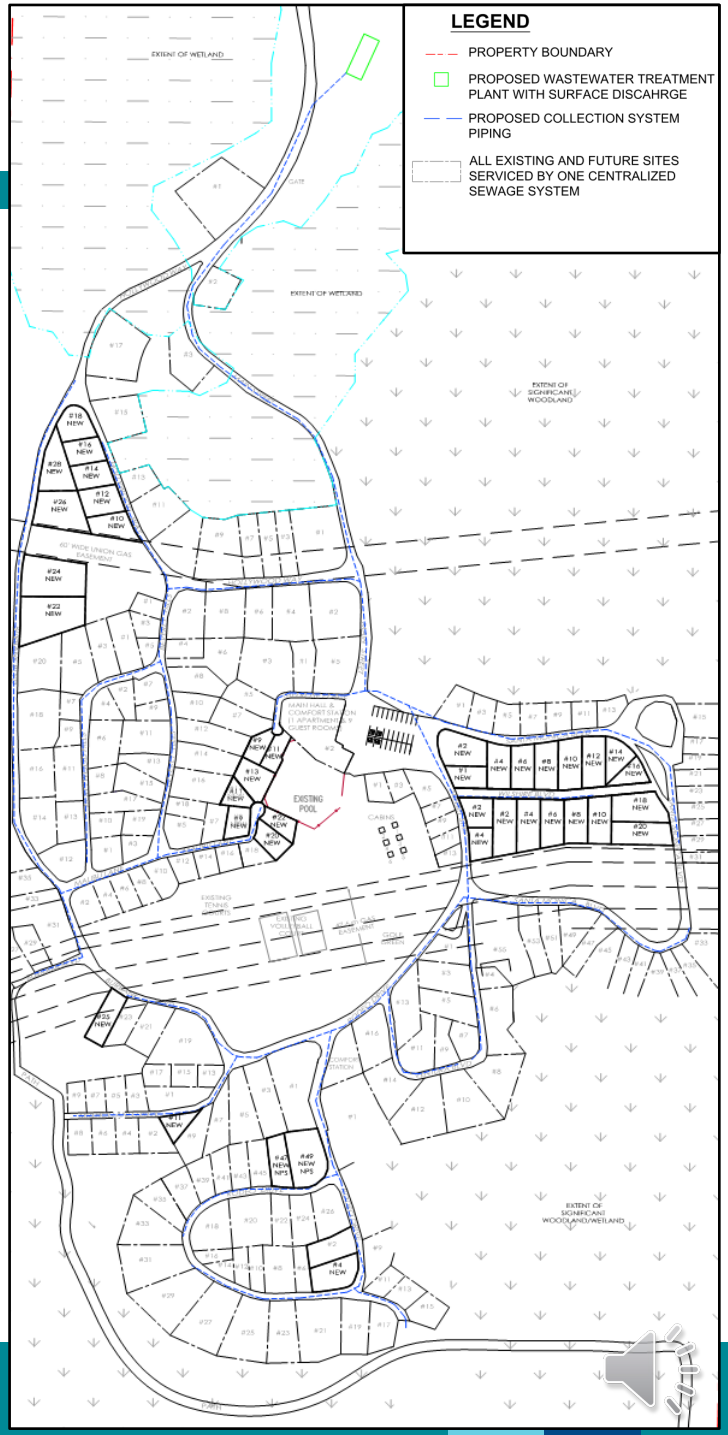
The Class EA will consider alternatives for the wastewater servicing, which would typically include options for subsurface or surface discharge of effluent, as well as treatment system options based on the required effluent quality to prevent impacts to the environment. These Alternatives are identified below:

1. Do Nothing
2. Improve the Current Wastewater System
3. Establish a New Centralized Wastewater System with Subsurface Discharge
4. Establish a New Centralized Wastewater System with Surface Discharge

Preferred Solution - Wastewater

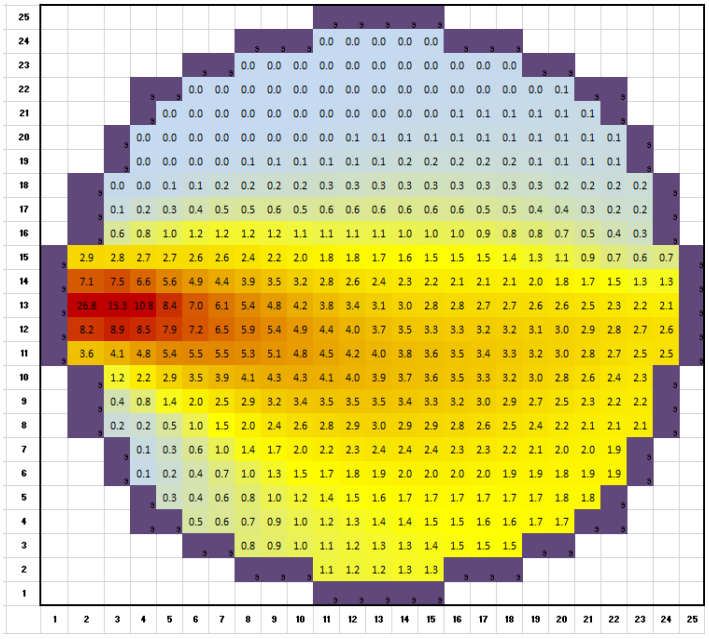
Alternative 4: Establish a New Centralized Wastewater System with Surface Discharge

Construction of a new centralized wastewater system including wastewater collection, treatment, and discharge of treated effluent to surface water via the existing onsite pond. The wastewater treatment plant would be located in the northern portion of the Site in the vicinity of the pond.



Receiver Assessment for the Proposed WWTP

- A receiving water study was completed to confirm the proposed discharge location for treated effluent and to support the development of proposed effluent requirements.
- A hydrogeological assessment determined that the pond is likely groundwater fed and groundwater outflow is in a north easterly direction, generally in the direction of the unnamed tributary.
- Mixing zone modelling estimated that with appropriate treatment there would be no impact of proposed effluent discharge on water quality in the pond or surrounding local surface and groundwaters.
- **The Study recommended that the new WWTP discharge to the local pond.**



Proposed Effluent Objectives and Compliance Limits

Effluent Parameter	Proposed Objective	Proposed Limit
cBOD5	5 mg/L	7 mg/L
TSS	5 mg/L	7 mg/L
TP	0.08 mg/L	0.10 mg/L
TAN		
Cold Weather (Nov 1 – Apr 30)	4.0 mg/L	5.0 mg/L
Warm Weather (May 1 – Oct 31)	2.5 mg/L	3.0 mg/L
DO	≥ 6.0 mg/L	-
E. coli **	200 CFU/100 mL	100 CFU/100 mL
pH ***	6.5 to 8.5	6.0 to 9.0

*Monthly average concentrations unless otherwise noted.

**Based on monthly geometric mean density.

***Based on single sample results.

Wastewater Alternative Design Concepts
Treatment

- A membrane bioreactor treatment technology is the only alternative that can meet the proposed effluent objectives and compliance limits.
- Other alternatives (for example, Extended Aeration, Sequencing Batch Rector (SBR), Rotating Biological Contactor (RBC)) could not meet the required effluent objectives; therefore, these design alternatives were removed from further consideration.
- An evaluation matrix for treatment is not required as only one option can meet the design requirements.

Wastewater Alternative Design Concepts

Collection System

Alternative 1: Gravity Sewers and Sewage Pumping Station

- Main sanitary sewer with manholes collecting wastewater from surrounding units through servicing connections.
- Sewage pumping station that collects and pumps the wastewater through a forcemain to the wastewater treatment plant.
- Based on a review of ground elevations at the Site, this collection system would require one sewage pumping station, given that the pipe route would be relatively flat.
- The proposed sewage pumping station would be located in the central portion of the site.

Wastewater Alternative Design Concepts

Collection System

Alternative 2: Septic Tank Effluent Pump (STEP) with Low-Pressure Sewer Collection System

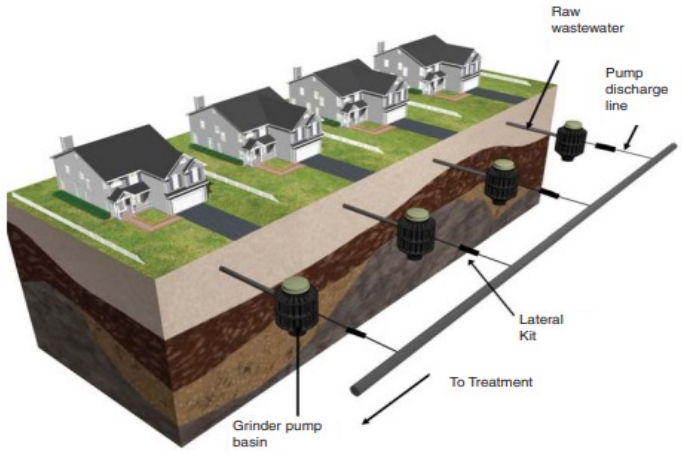
- STEP system consists of a septic tank as primary treatment allowing solids, grits and greases to settle and collect at the bottom of the tank.
- Effluent pumps will convey the partially treated liquid wastewater through low-pressure sewers to the proposed WWTP.
- Sewer pipe will be small diameter (50-75 mm) pressurized pipe. Using flexible piping removes the need for straight alignment and manholes as in conventional gravity sewers.
- Pressurizing the sewers eliminates the need for a minimum slope, reducing construction costs as piping can all be placed at a single depth.

Wastewater Alternative Design Concepts

Collection System

Alternative 3: Grinder Pumps with Low-Pressure Sewer Collection System

- Consists of a small grinder pump station at each unit that pumps the wastewater into the small diameter (50-75 mm) pressurized pipe collection system.
- Grinder pumps will convey the wastewater through low-pressure sewers to the proposed WWTP.
- Flexible piping removes the need for straight alignment and manholes as in conventional gravity sewers.
- Pressurizing the sewers eliminates the need for a minimum slope, reducing construction costs as piping can all be placed at a single depth.



Evaluation Criteria – Wastewater Collection System

NATURAL ENVIRONMENT

- Impacts to designated sites/species
- Impacts to surface water quality
- Impacts to groundwater quality and quantity
- Impacts to hazard lands (erosion, slope stability, flooding)
- Impacts to vegetation and terrestrial habitat
- Impacts to aquatic habitat
- Source Water Protection

SOCIO-CULTURAL ENVIRONMENT

- Conformity with City/Region official plan
- Heritage resources (archaeological features, built heritage, and cultural landscapes)
- Nuisance impacts

TECHNICAL ENVIRONMENT

- Monitoring requirements
- Operation & Maintenance requirements and complexity
- Special engineering requirements [Footprint Requirements] [Conformity with guidelines and standards]

ECONOMIC ENVIRONMENT

- Comparative capital costs
- Estimated operations and maintenance costs
- MRA financial assurance (Note: The MRA Financial Assurance is significantly higher if the systems are not up to the required standards).

Evaluation Criteria	Alternative 1: Gravity Sewers and Sewage Pumping Station		Alternative 2: Septic Tank Effluent Pump (S.T.E.P.) with Low Pressure Sewer Collection System		Alternative 3: Grinder Pumps with Low-Pressure Sewer Collection System	
Natural Environment	?	No anticipated impacts to designated sites/species or aquatic habitat and surface water. More susceptible to infiltration compared to pressure sewers, and will have deeper excavations, increasing the potential for interaction with local groundwater. Larger area of disturbance due to deeper and wider trenches to accommodate larger, deeper sewers.	?	No anticipated impacts to designated sites/species or aquatic habitat . No anticipated impacts to surface or groundwater. Some larger excavations in localized areas of the site to accommodate septic tanks.	●	No anticipated impacts to designated sites/species or aquatic habitat . No anticipated impacts to surface or groundwater. Localized disturbance for small grinder pump stations, which have a smaller footprint than a septic tank.
Socio-cultural Environment	?	Will comply with City Official Plan. Location of pumping station would be within the already disturbed area. Potential for short term nuisance impacts such as noise, dust, emissions, and odour as a result of construction activities.	?	Will comply with City Official Plan. Location of septic pre-treatment tanks would be within the already disturbed area. Potential for short term nuisance impacts such as noise, dust, emissions, and odour as a result of construction activities. Potential for periodic nuisance impacts as a result of haulage from pre-treatments tanks. No ongoing nuisance impacts are anticipated	?	Will comply with City Official Plan. Location of grinder pump tanks would be within the already disturbed area. Potential for short term nuisance impacts such as noise, dust, emissions, and odour as a result of construction activities. no ongoing nuisance impacts are anticipated.
Technical Environment	?	Lowest operation and maintenance requirements due to reliance on gravity and limited use of pumps. Requires significant bedrock removal due to shallow bedrock and limited slope on the site. Inflow and infiltration would need to be incorporated into the design flows.	?	Regular pump-outs required for the multiple pre-treatment unit pumps will require maintenance in order to ensure proper function. Requires design of effluent pumps for each unit or group of units, and confirmation of adequate power supply. Sewers to be insulated to allow shallower depth of burial.	?	Pumps will require regular maintenance to ensure proper function. Requires design of grinder pumps for each unit or group of units and confirmation of adequate power supply. Sewers to be insulated to allow shallower depth of burial.
Economic Environment	?	Highest Capital Cost due to increased rock excavation. Operational costs are lower due to relying on gravity to convey wastewater.	?	High capital cost. Multiple pre-treatment settling units increases cost over use of grinder pumps to convey wastewater. Higher operational costs due to regular pump-outs and greater number of pumps throughout the site	?	Lowest Capital cost. Less bedrock excavation needed due to using pumps. Grinder pump less costly than STEP systems. Moderate operational costs due to greater number of pumps throughout the site as compared to a gravity sewer
Overall Summary	**Not Carried Forward**		**Not Carried Forward**		**Carried Forward**	

Level of Preference: Least Preferred ○ Less Preferred ??? Moderately Preferred ??? More Preferred ???Most Preferred ●

Next Steps

- Review the input received from this PIC and Agencies
- Confirm preferred design concept for wastewater servicing
- Validate preferred design concept for water servicing
- Complete of Environmental Study Report based on feedback
- File Environmental Assessment Study for Public and Stakeholder review

Invitation for Participation

Thank you for participating in this PIC.

Public input is an important component of the decision-making process.

You are invited to submit a Comment Sheet to one of the Study Team members below on or before July 8, 2022.

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Comment Sheet and PIC Presentation available at:

www.rjburnside.com/ponderosa