

Alternative Water Supply Concepts



Presentation to the
City of Parkville

...Trevor Wicks ...

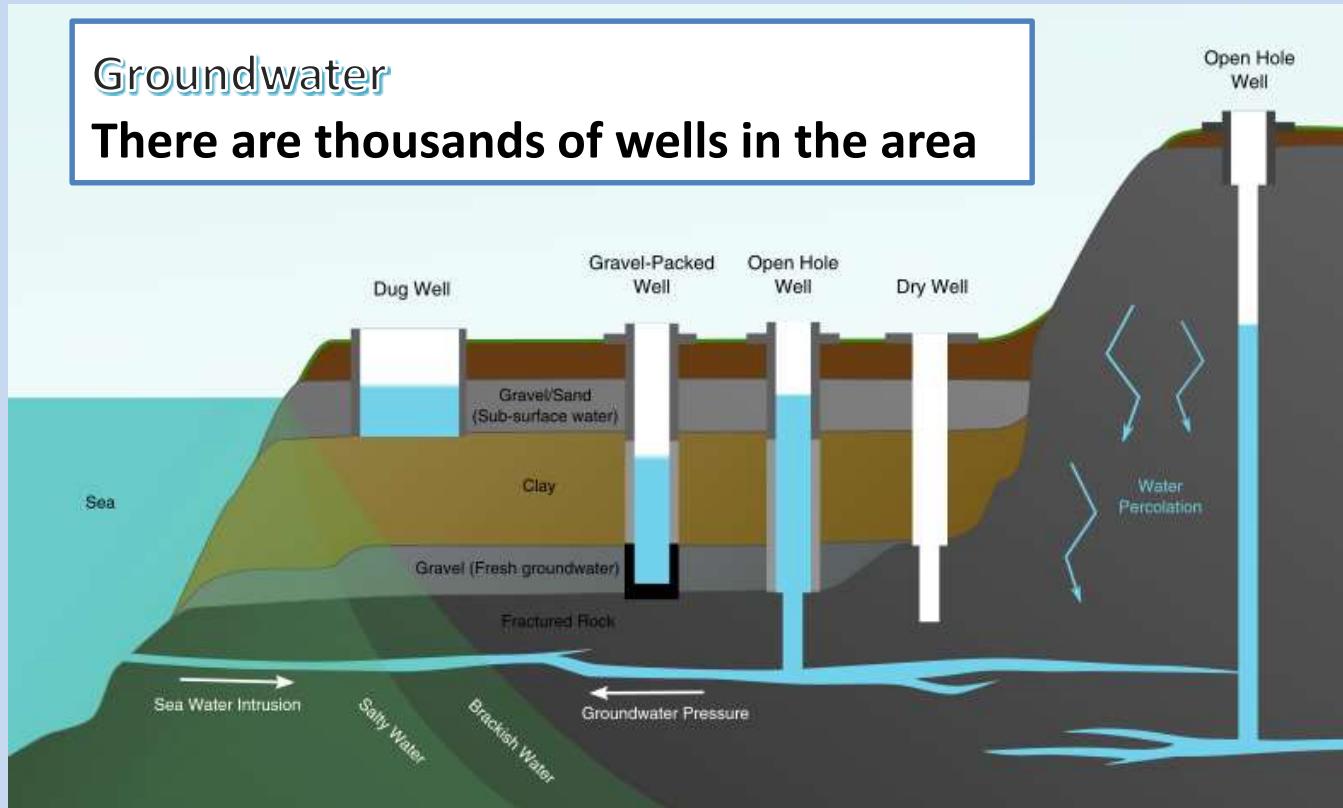
April 2015

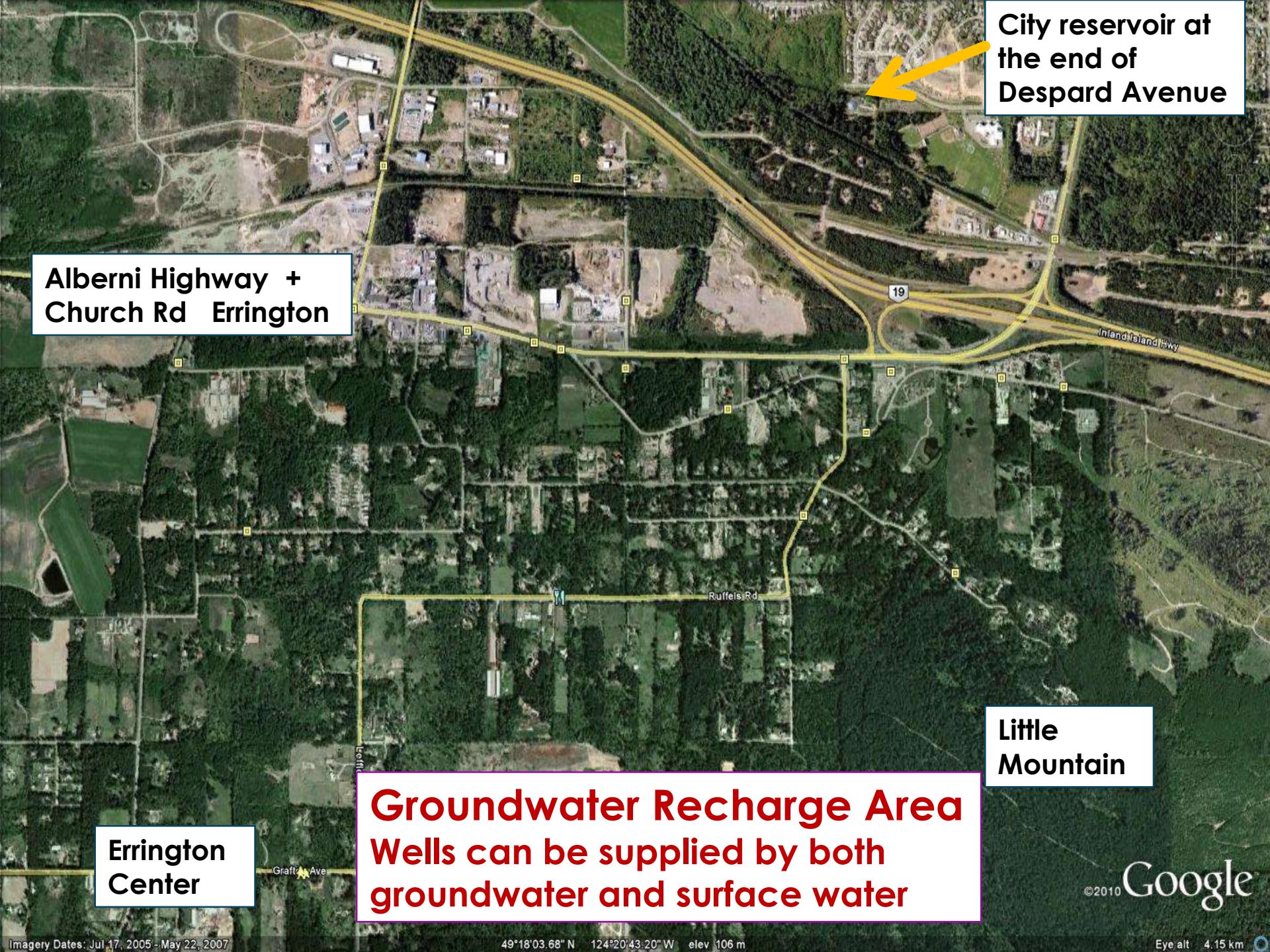
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The City of Parksville depends on both groundwater and surface water to supply a population of just under 12,000 people.

Groundwater

There are thousands of wells in the area





City reservoir at
the end of
Despard Avenue

Alberni Highway +
Church Rd Errington

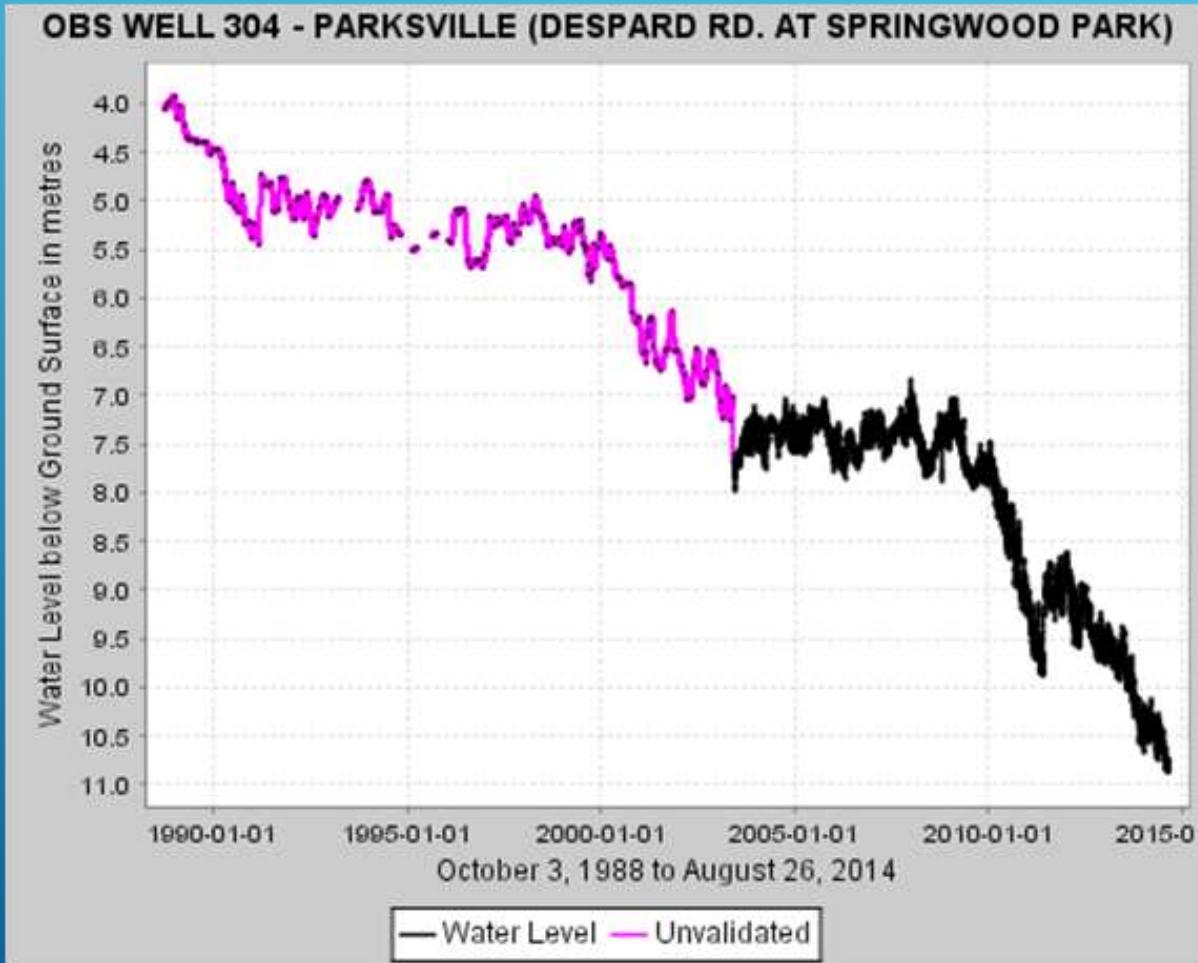
Little
Mountain

Errington
Center

Groundwater Recharge Area
Wells can be supplied by both
groundwater and surface water

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The groundwater levels at an observation well in Springwood Park continue to drop at an alarming rate. The level is now down to 11 meters. Historically the groundwater level was at the surface of the land.





The continued decline indicates that extraction at the current rates is unsustainable.

The lowering groundwater levels also increase the risks to human health from contaminating land uses in the groundwater recharge areas.



The current surface water intake is not dependable to supply safe drinking water, for a growing population





The watersheds inland from the coast, provide excellent potential for high elevation water storage

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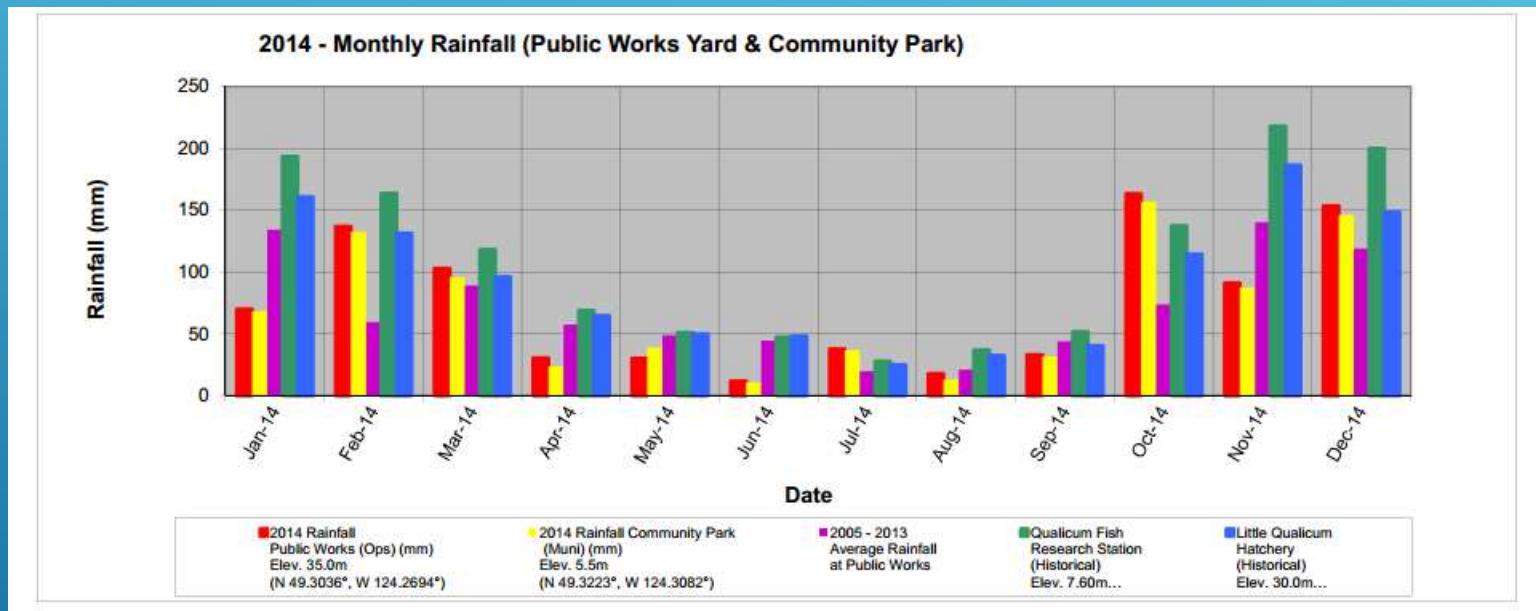
Data SIO, NOAA, U.S. Navy, NGA, GEBCO

Google earth

Storing high quality water, at high elevation has many benefits

- 1. Water is relatively clean**
- 2. Minimal contamination risk**
- 3. Provides ecological and fisheries benefits**
- 4. Eliminates the need for summer extraction from the river**
- 5. Reduces storm flooding**
- 6. Will flow downhill for free**
- 7. Very low operational costs**
- 8. Can generate electric power**
- 9. Can supply many different areas**

High flow diversion and storage of water, would occur in late fall, winter and in spring and early summer during storm events.



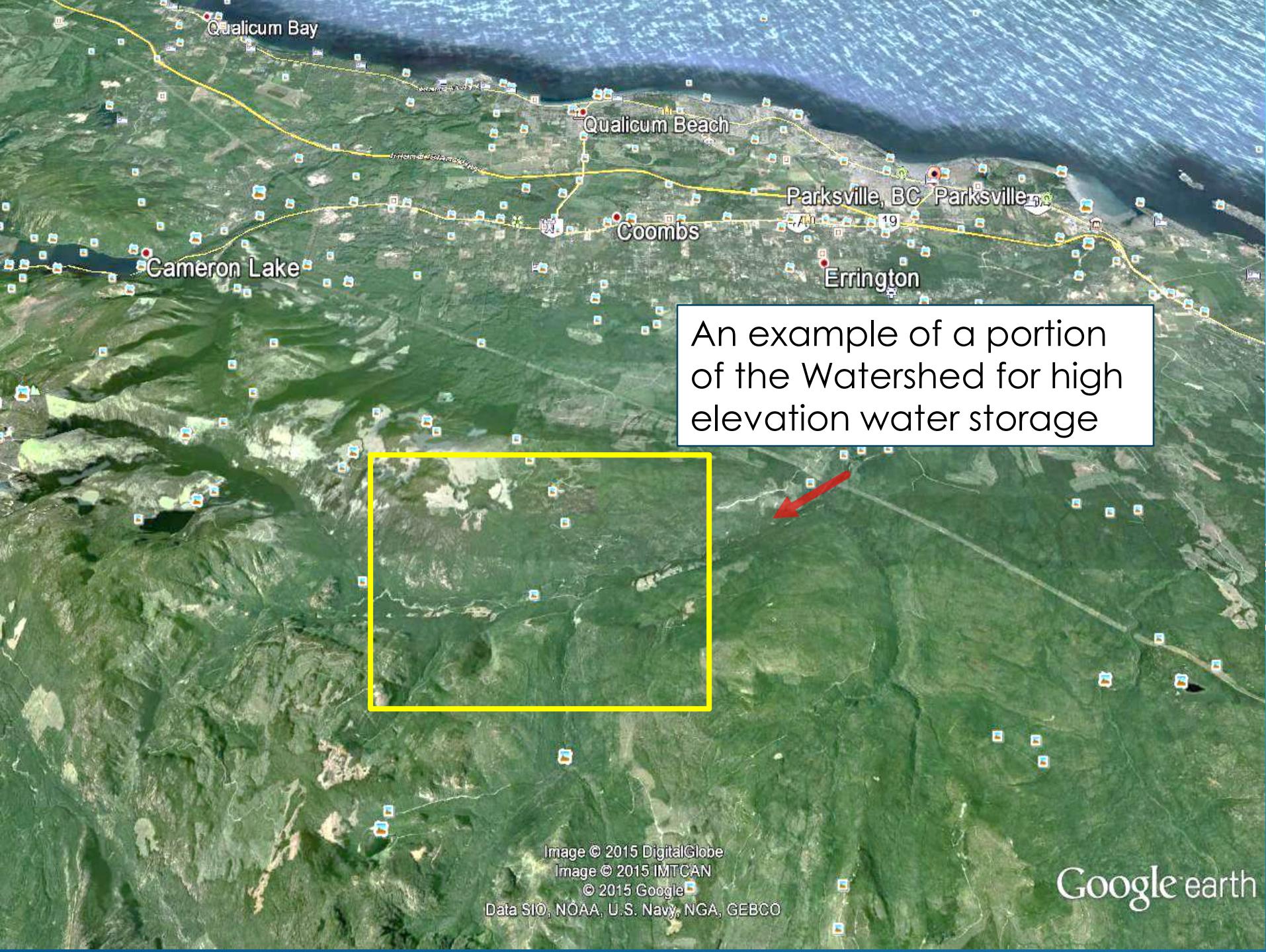
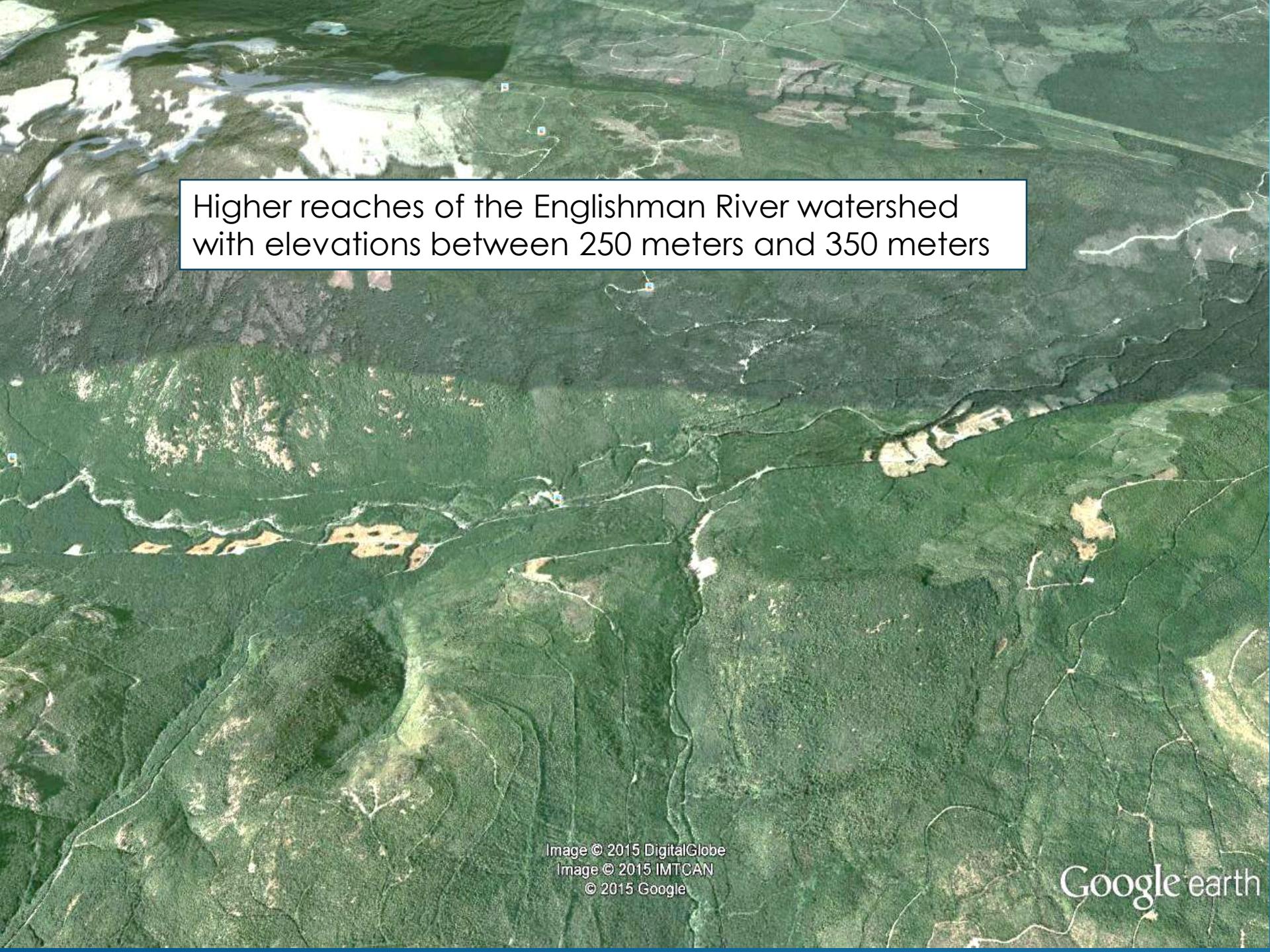


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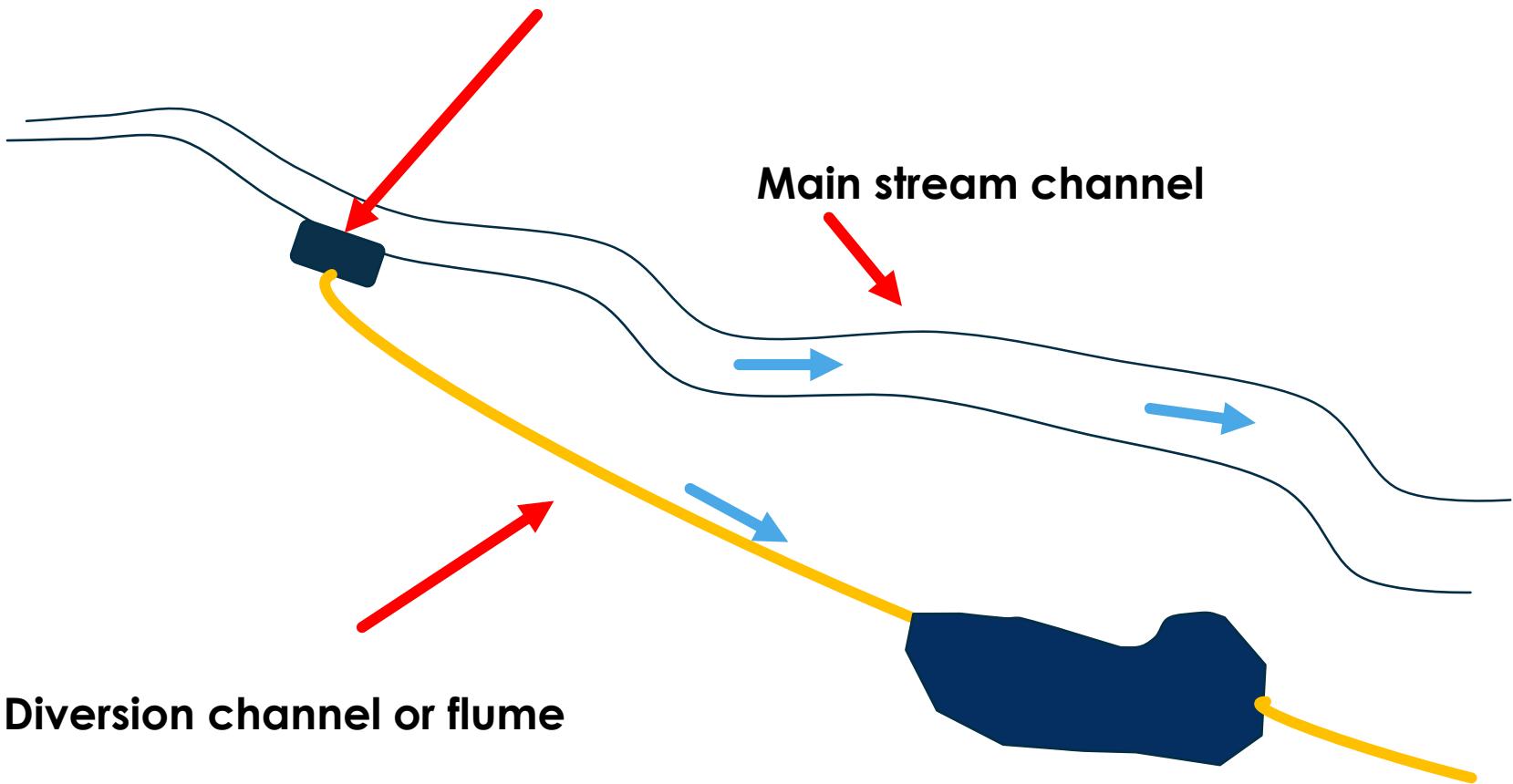
Higher reaches of the Englishman River watershed
with elevations between 250 meters and 350 meters

Channel overflow structure on
the side of the main stream

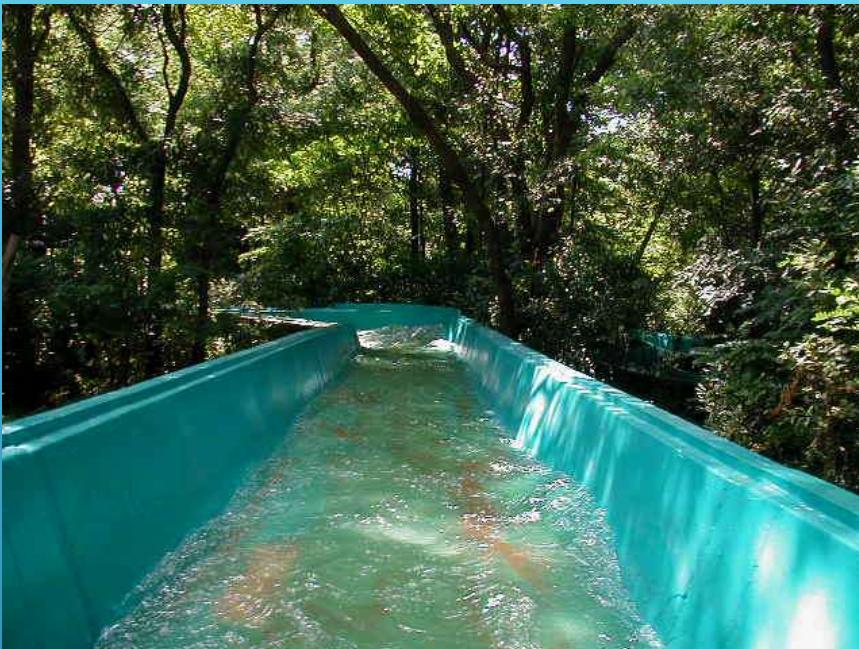
The existing creek or river
channel would not be directly
impacted



Overflow diversion weir



Diversion channel or flume

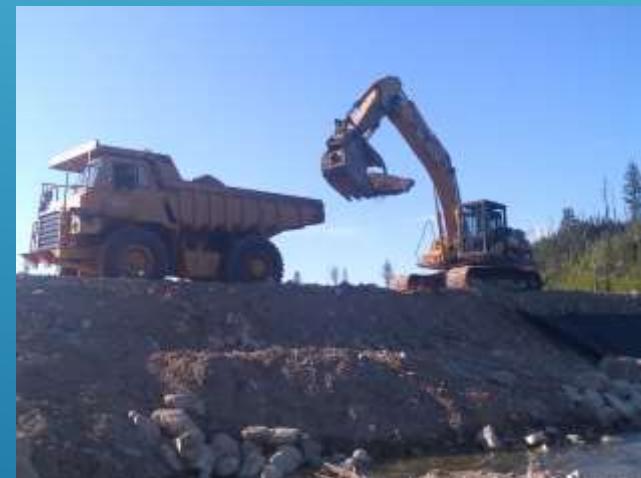


The diversion channels carry water, to fill constructed storage ponds / lakes





The ponds /lakes are constructed into the natural topography and are interconnected with naturalised streams and/or wetlands





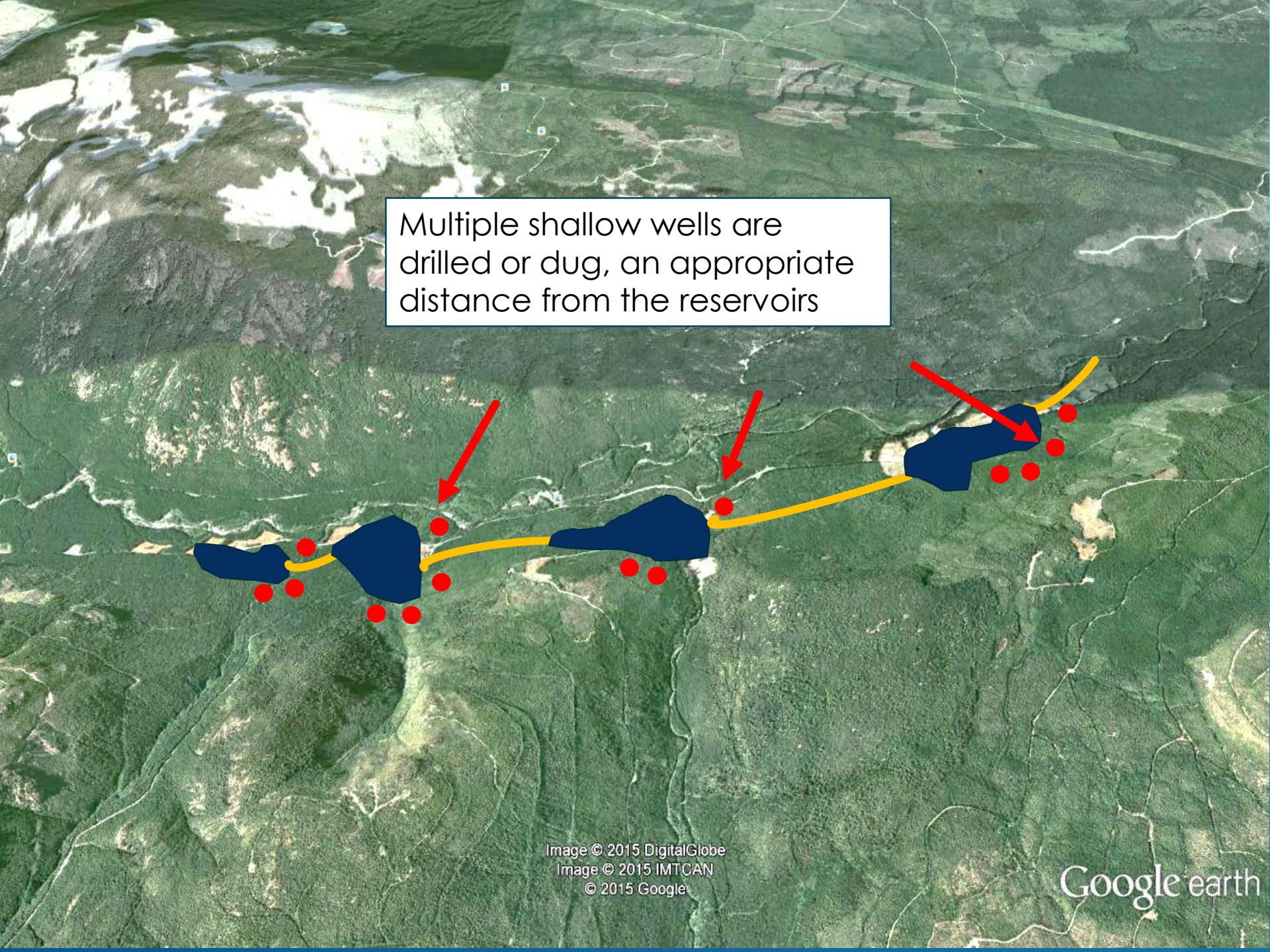


Many of the retention areas will receive inflow from surrounding land

The ponds/lakes will be vegetated with indigenous plants and trees.

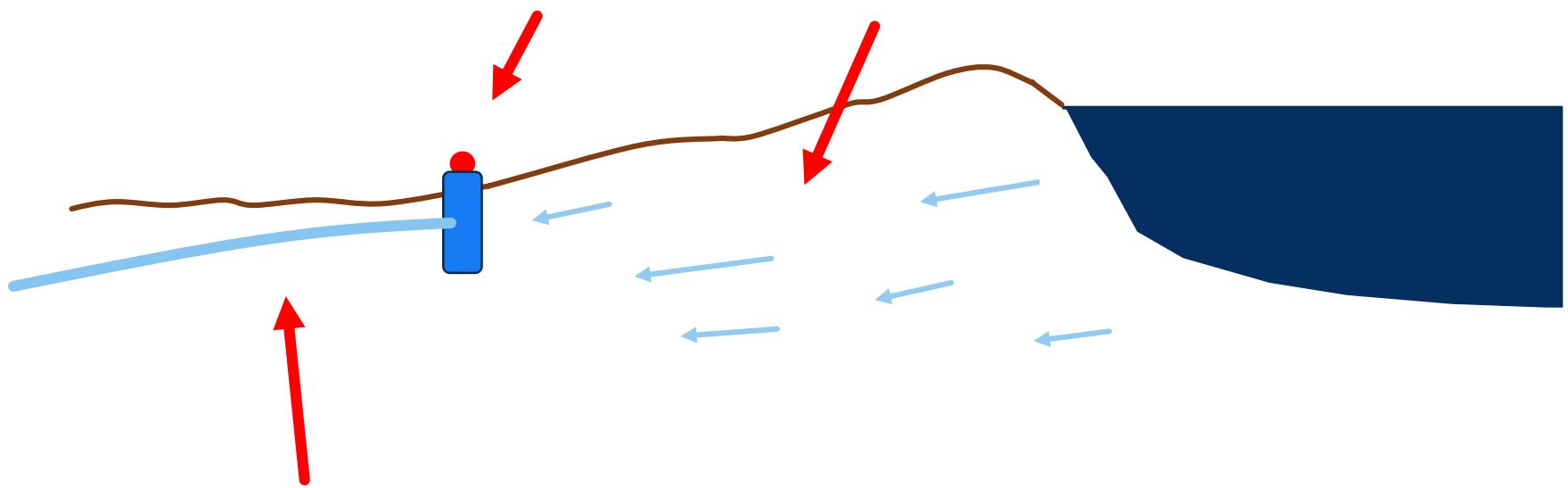


Overflow structures allow the fresh water to fill the ponds and the surplus to flow back to the stream



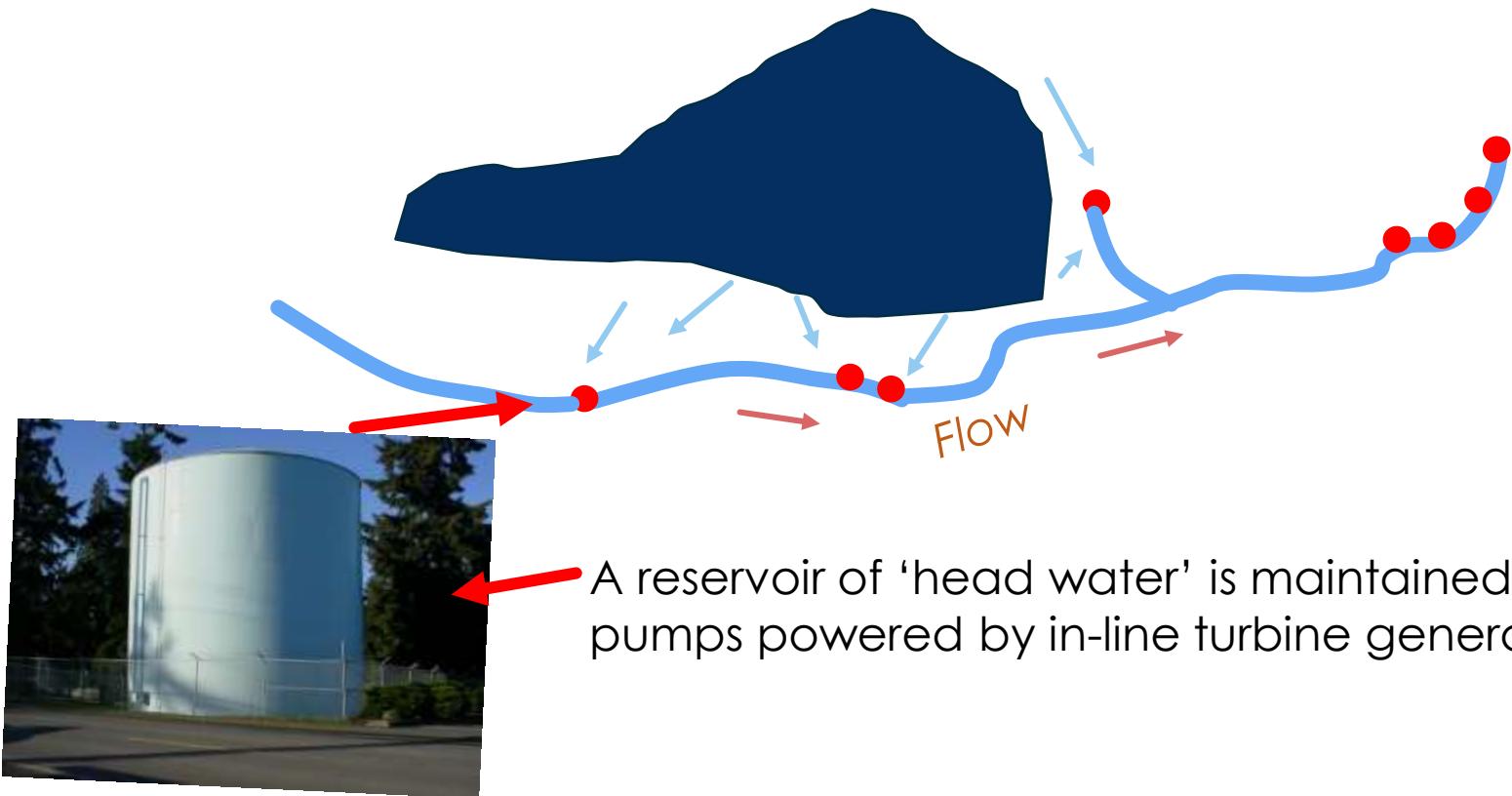
Multiple shallow wells are drilled or dug, an appropriate distance from the reservoirs

The water from the reservoirs slowly infiltrates the surrounding land and recharges the groundwater for the wells.



The wells are inter-connected by small diameter siphon pipes, that carry the water downhill under pressure

The multiple siphon pipes are sized for continuous flow with remotely controlled valves downhill



Micro hydro in-line turbines could be installed, anywhere in the downhill pressure side of the supply system.





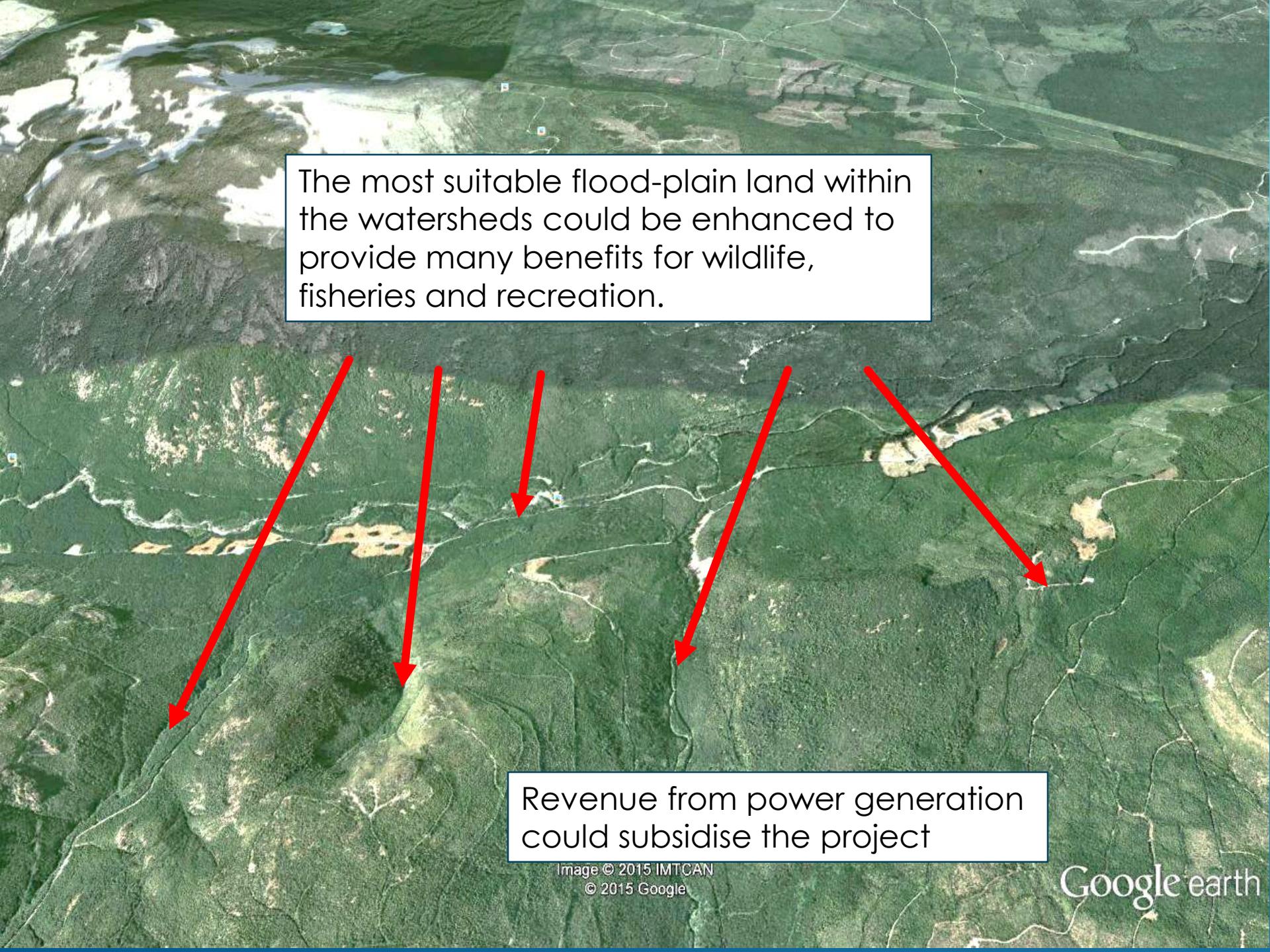
An advantage of multiple, small diameter, high pressure gravity lines, is that the source to delivery has many available options.

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The most suitable flood-plain land within the watersheds could be enhanced to provide many benefits for wildlife, fisheries and recreation.

Revenue from power generation could subsidise the project



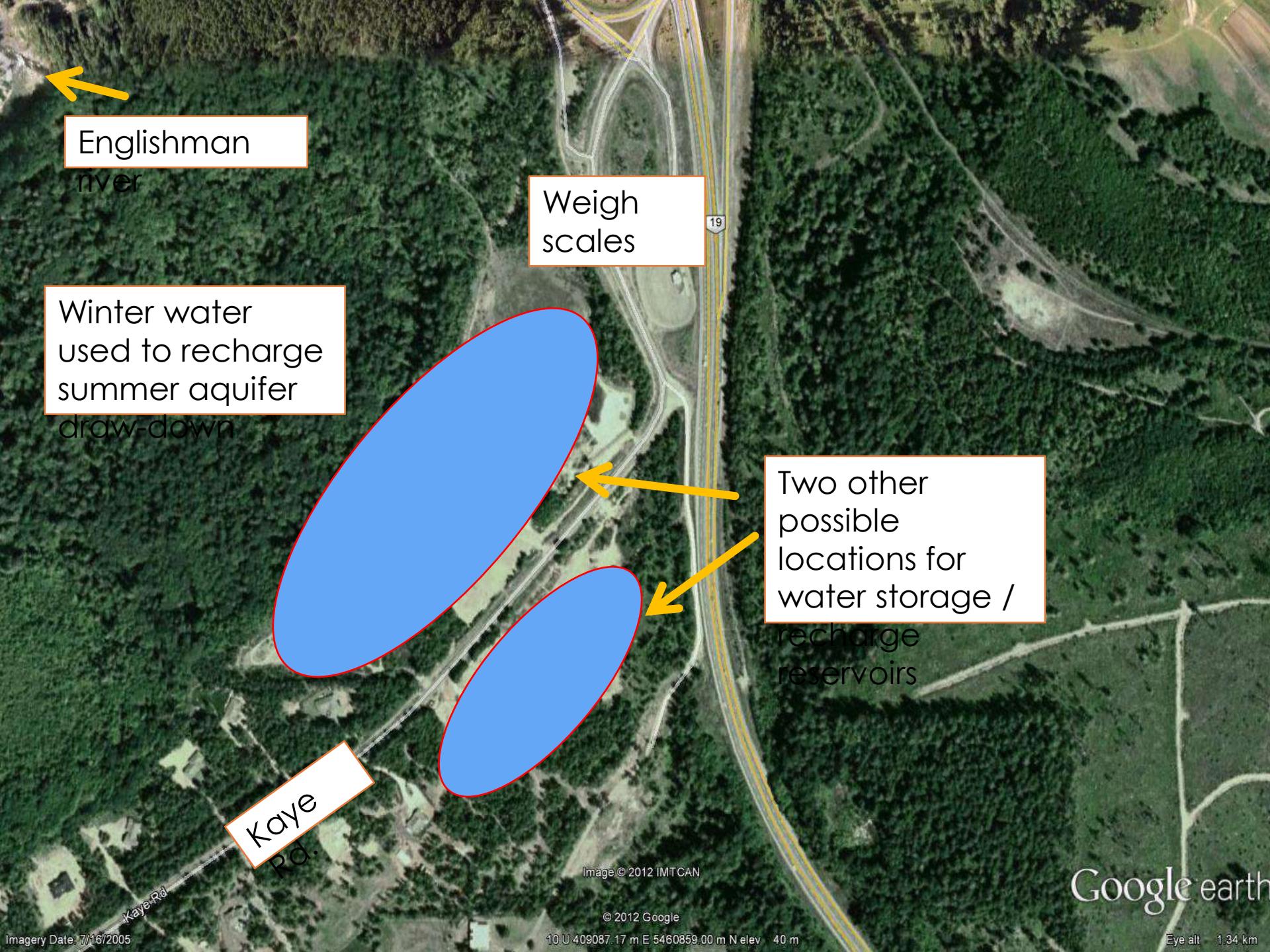




Many other options are possible for storage of surplus winter water

Two of the possible locations for water storage / recharge reservoirs

Google earth



Englishman
river

Weigh
scales

Winter water
used to recharge
summer aquifer
draw-down

Two other
possible
locations for
water storage /
recharge
reservoirs

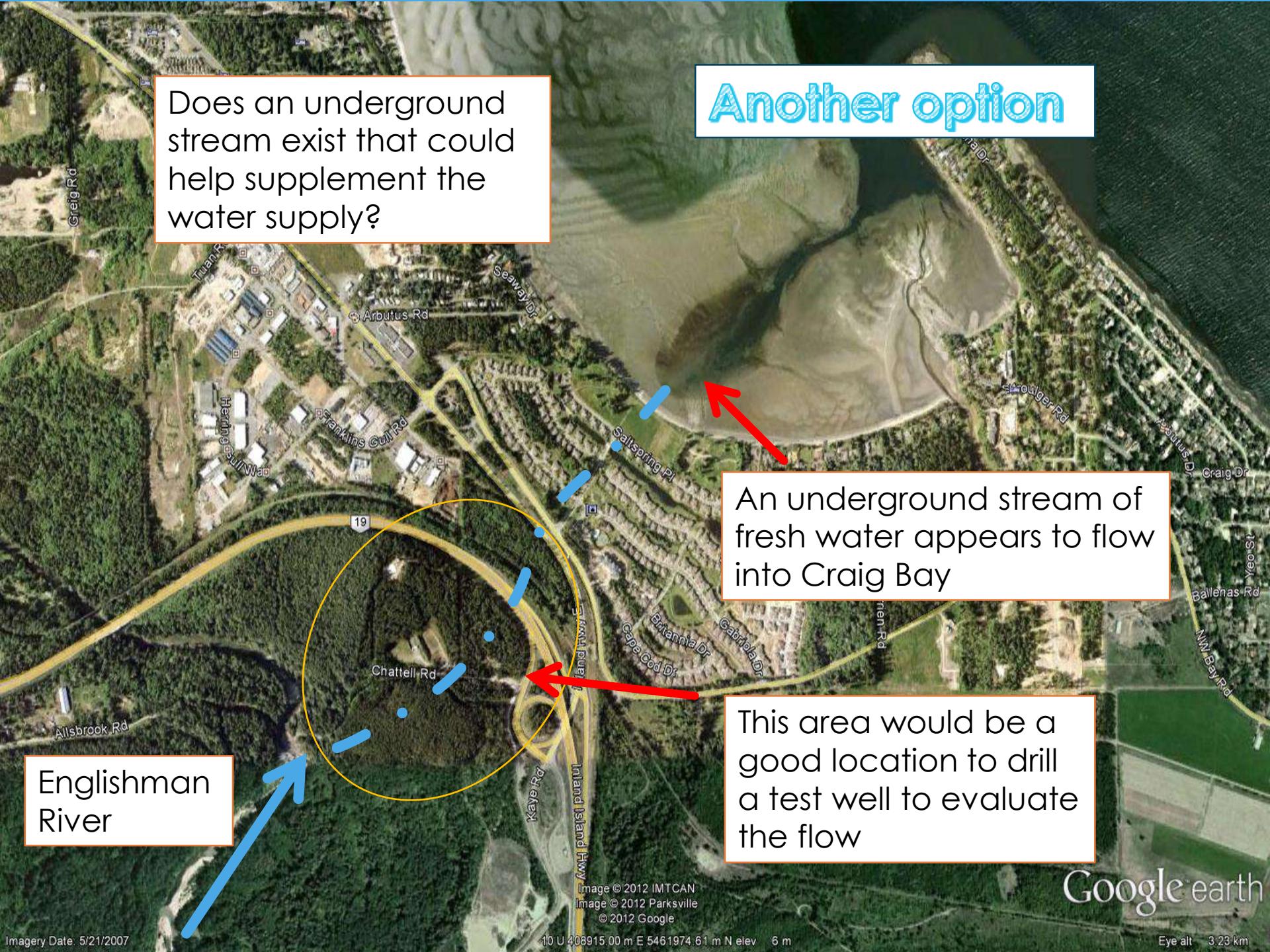
Kaye
Rd.

Image © 2012 IMTCAN

© 2012 Google

10 U 409087.17 m E 5460859.00 m N elev 40 m

Google earth



Englishman
River

Does an underground stream exist that could help supplement the water supply?

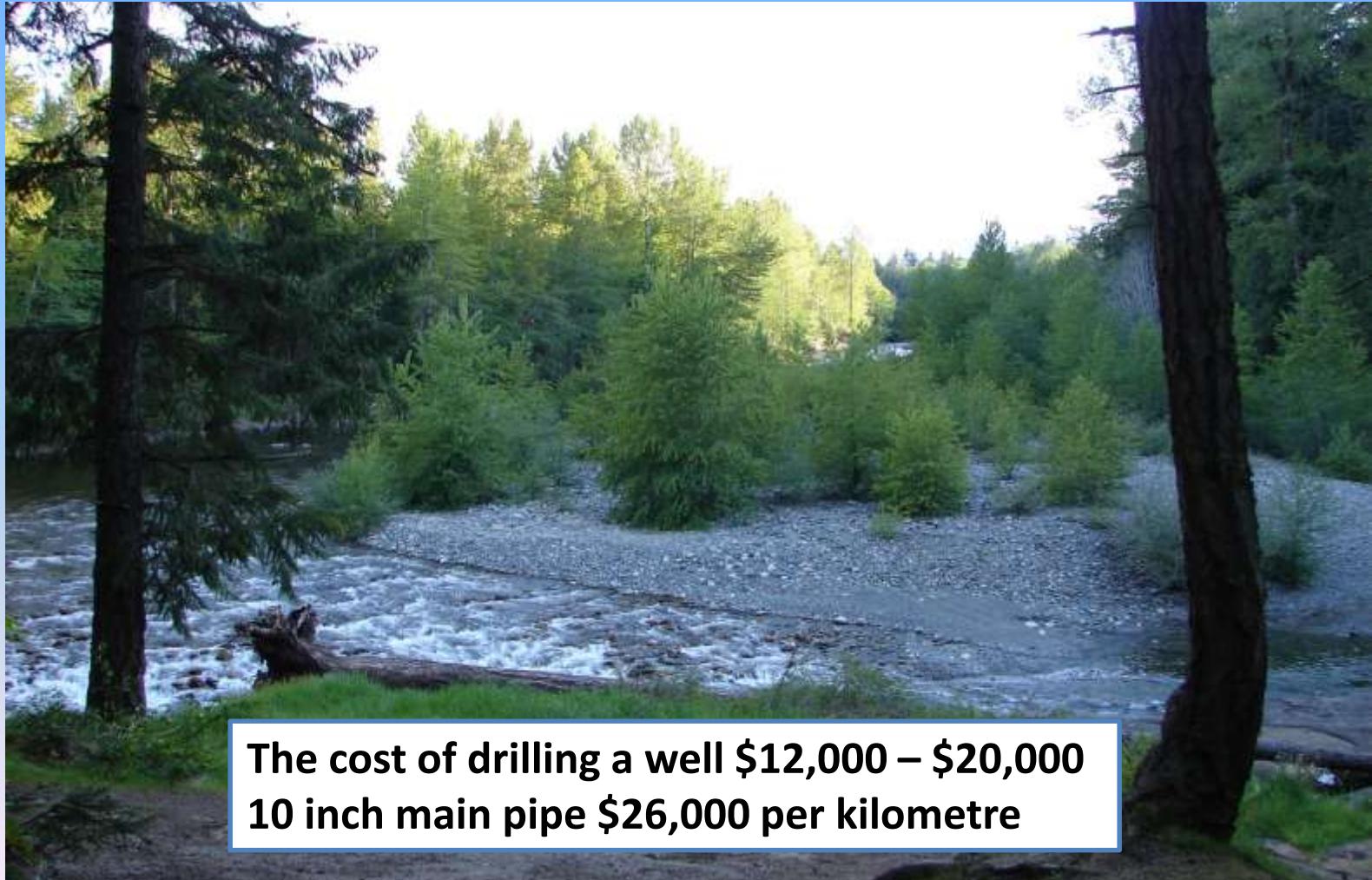
Another option

An underground stream of fresh water appears to flow into Craig Bay

This area would be a good location to drill a test well to evaluate the flow

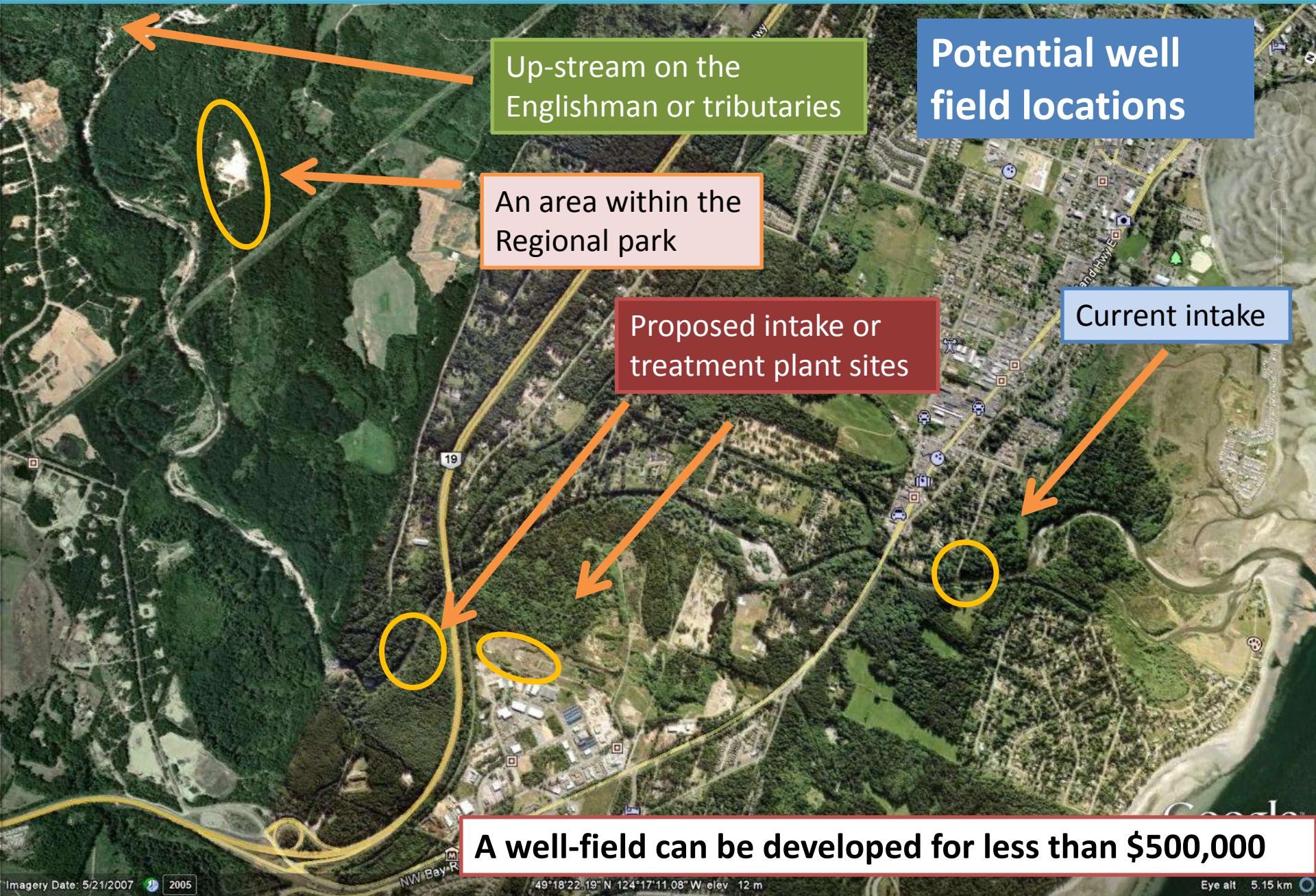
Develop a well field/s upstream and in proximity to the Englishman River or a tributary?

The location and depth of the wells could eliminate the need for a full water treatment plant, as with San Pareil and Qualicum's river wells.



**The cost of drilling a well \$12,000 – \$20,000
10 inch main pipe \$26,000 per kilometre**

Potential sites for well-field development utilizing naturally filtered water to reduce or eliminate the necessity for water treatment other than disinfection.





**Encourage rainwater harvesting,
storage and utilisation systems.**



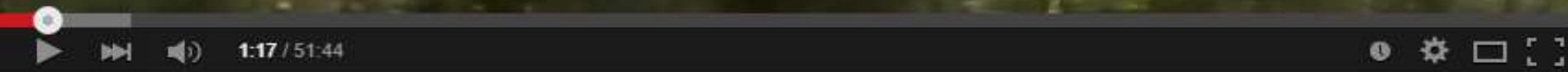
Drinking Water Free Refill Center



Pure drinking water,
free of chemicals,
UV disinfection
preferred.



Troubled Water



Troubled Water - full film



Manly Media



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I request that the Council of City of Parksville initiate discussion about a back-up plan as the groundwater supplies are becoming contaminated, and insufficient.

Thank You

...Trevor Wicks ...

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