DELI

DUAL ESTUARY/LAKE IDEA

A PLAN TO FIX CAPITOL LAKE

April 2016

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Introduction

This document is for people interested in fixing the Capitol Lake situation. It presents an idea for having a dual system of both an estuary and a lake, something that has been reviewed and rejected in the past. However, I believe the review was biased and the rejection unfounded. In short, they exaggerated the volume and cost of materials needed to build a wall to contain a new lake, and simply summarily dismissed the ability to construct a rubble mound dike on the soft mud even though the railroad crossing at Marathon Park already occurs on one.

DELI stands for **D**ual **E**stuary/**L**ake **I**dea, and should be considered a third option to CLIPA and DERT. It should also be considered an option that will give everyone almost all of what they want rather than making half the community angry at the outcome. Restoring an estuary will not be cheap mostly because of roadway needs, but including the cost of a lake containment wall would give massive added taxpayer value to the dollars spent because then almost everyone would be happy with the built condition.

Please read this document with an open mind and a careful eye because I know DELI can be made better. My presentation always improves each time I do a bout of editing. Developing ideas should be like whittling arrowheads where each little chip makes the thing better and better until you finally have something you can mount on a shaft. DELI needs to get there.

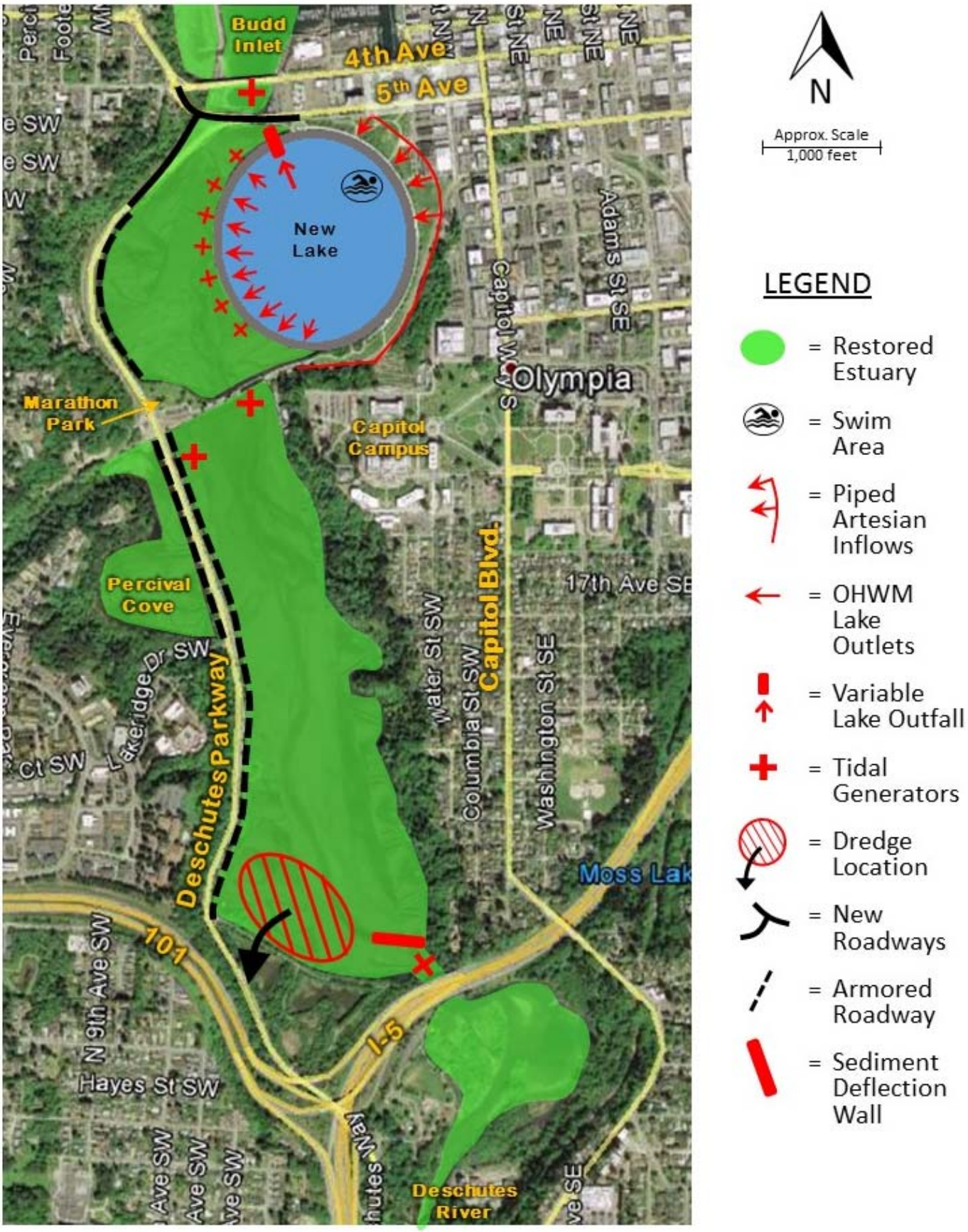

Figure 1: Dual Estuary/Lake Idea (DELI)

Basic Concept

Remove the existing 5th Avenue dam and build a wall to create a new, hydrologically isolated, freshwater lake in the North Basin set against Heritage Park. Then restore everything west and south of the new lake wall to tidal estuary up to Tumwater Falls and including Percival Cove. The new lake would be supplied with groundwater from artesian flows beneath Capitol Hill and have no inputs from the Deschutes River or Budd Inlet.

New Lake Impoundment

Complete Heritage Park Bulkhead Circle

Build a barrier wall to contain a new Capitol Lake by completing the circle of the existing Heritage Park bulkhead. This would create a smooth edge on the lake side that should be visually pleasing within the developed urban environment of downtown Olympia. Everything inside the circle would be freshwater lake, while everything outside it to the west would be tidal estuary.

Build Rock Containment Wall

Driving pilings to bedrock in tidal lands is what you need to do to build buildings, not water control structures. The latter can be built with piled boulders in a rubble mound dike, just like they used for building the existing railroad beds across the lake and along the west shoreline of Budd Inlet. These railroad beds have survived over a half century of use and several major earthquakes without any significant damage.

Use Black Lake Quarry Basalt

Material for the new containment wall could be sourced from Black Lake Quarry and brought to the site by rail (Percival Creek spur). This would eliminate damage to city streets from heavy trucks as well as a lot of traffic disruptions. Rock from here could be delivered and installed for about $21/cubic yard.

Create Pedestrian Walkway

Have the rock barrier stop just below the ordinary lake waterline and then build a concrete, pedestrian walkway on top. The east bulkhead wall could then be lowered to water level. This would create a beautiful built urban environment within a natural setting.

Use New Wall to Protect Downtown from Floods

The outside (west) edge of the new lake impoundment wall should be designed to protect downtown Olympia from high waters. This would include both flood flows from the Deschutes River to the south and high tides and rising sea levels from the north. To this end, designing the wall to be built higher in the future with relative ease would seem prudent given the potential for continuing sea level rise.

New Lake

Artesian Inputs

The new Capitol Lake basin could be supplied with freshwater via artesian flows emanating from beneath Capitol Hill. This water source is clean and abundant (the aquifer is considered effectively inexhaustible, meaning there is more water available than could be functionally used). Accessing this aquifer to supply the lake would simply involve poking pipes into the ground and daylighting the water to the surface. Putting valves on these pipes would allow for complete control of the flow.

No Water Right Permit Needed

Using groundwater to supply a new isolated north basin lake should be considered a passive, non-consumptive use, which means that all the water still goes to the same place it went before (Puget Sound), with no significant loss of volume. This should not require a water right permit because the water isn't being consumed.

New Swimming Beach

Create a swimming area by laying down a couple acres of impervious fabric over the mud and then cover it with a layer of sand and gravel to make a beach. Locating this swim beach at the northeast shoreline of the new lake would give the best sun exposure. The artesian inputs could be piped to the swimming area and then flushed from the shoreline towards multiple lake outlets along the west side of the containment wall to keep the water fresh and clean.

Keep Lake Level Low for Stormwater Detention

Because lake artesian inputs could be controlled, the new lake would not always need a positive outfall to keep from filling up. With a variable invert design that goes to zero on a single, primary outfall, the artesian inflows could be stopped and then the lake drained on low tides, creating a very large capacity for temporary detention of downtown stormwater, much like they do now with the whole lake, only better (vastly more capacity).

Potable Water for Disaster Relief

When the big earthquake hits Olympia, it is very likely that most water mains will break. Supplying potable water to the public will be an immediate, dire need. The artesian waters used to maintain a new Capitol lake could easily meet this need. Artesian flows require no human-based power source to operate, so even if all our power infrastructure fails in a disaster, potable water will still be there for us to drink with a DELI built condition.

New Estuary

Estuary Plan with New Lake Added On

DELI is basically the all Estuary option with a new isolated North Basin lake added on. All costs and considerations for Estuary restoration would be the same.

Restored Estuary Gets the Most Habitat

The existing area of Capitol Lake that would get restored to tidal flow would be around 80% of the landscape. That's not a bad trade off, especially considering how the lake will probably enhance the estuary by providing clean, freshwater habitat for many water birds to bathe, drink and hang out on, especially at low tides.

Keep Marathon Park

Even though Marathon Park is fill, it's also an iconic part of downtown Olympia. Keeping this landscape feature will not significantly harm estuary restoration, and having tidal flows pulse through the constriction formed between the middle and north basins might even benefit water circulation.

Emphasize Natural Volunteer Regrowth

Estuary restoration should strongly emphasize natural, volunteer establishment of tidal plant and animal communities to reduce costs and make sure we get it right in the long run. Let the estuary figure out itself where everything should go rather than trying to achieve a predicted design made by people. This will ultimately give us the best habitat available at the lowest cost. Primary human intervention with plant and animal establishment should focus on controlling any unwanted species.

Roadway Considerations

New Elevated Roadway

The existing 5th Avenue roadway atop the dam should be replaced with an elevated ramp extending west to connect with the Deschutes Parkway and the roundabout with 4th avenue as previously proposed for estuary restoration. The opening beneath would become the estuary outfall.

Reinforce Deschutes Parkway

The Deschutes Parkway roadbed will be degraded by the leaching action of tidal waters fluctuating against it. Measures to address this issue must be taken if an estuary abuts the roadway. Armoring the flank as previously proposed for estuary restoration should still make the most sense.

Dredging

Resurrect Old Dredging Idea

The idea to dredge lake sediments by pumping slurry into the holding ponds built in the southwest corner of the middle basin was a good one. This allows the dredged slurry to dewater and then be hauled away as dry material with a significant reduction in weight (and thus cost). The idea should be resurrected, but with a modified technique.

Build Permanent Electric Pump

Install a permanent pumping station on the shoreline where the holding ponds are and make it electric so it's quiet. Then hook up hoses to suck up sediments from a defined area of the mudflats in the adjacent southwest corner of the Middle Basin. If the dredging area is kept as a depression, sediments will naturally tend to fill in the hole. You could also build a deflecting wall on the north side of the I-5 overpass that would send the current borne sediment directly to the hole.

Plan for Annual Dredging

Dredging should be done every year within whatever fish windows are required. The amount dredged should be approximately equal to the annual input of sediments so an equilibrium is eventually attained. Some jurisdiction should hire an employee who could be trained to manage the dredging as part of their job, and day labor needed for the operation could be hired from trained Port of Olympia Longshoremen.

Potential Tidal Power Generation

Tidal Generation

Tidal flows can produce electricity with submersed turbines. Because the new DELI design would have several constriction points that accelerate tidal flows, there is potential for producing valuable, clean energy. Turbines could be placed beneath the I-5 Bridge, the two openings at Percival Cove and Marathon Park, and finally at the new estuary outlet area beneath the 4th and 5th Avenue bridges. It would also be possible to put turbines along the west toe of the new lake containment wall where dozens could be placed in a line around the curve that would naturally accelerate flows.

Use Vertical Turbines

Tidal generators should be the kind that spin on a vertical axis, not a sideways, horizontal one like wind turbines do. This would prevent harming fish or other wildlife because things within the water column would just get passed on, not chopped up. The turbines could also be geared to spin at a low speed to further protect from harm (its water, not wind, so you can crank down the gears and still get generation).

Epilogue

The battle over Capitol Lake between all lake vs. all estuary has been going on for a couple decades now with no end in sight. It's time for both sides to step back from their extreme, opposite positions and accept a compromise solution like DELI that will give everybody most of what they want.

DELI is something that can actually get done because it's politically friendly. Elected officials are loathe to get involved with divisive, community issues where each side has half the electorate in support. I believe that's the main reason the existing stalemate has lasted so long because no politician wants to stand up and promote either side for fear of having the other side vote against them. Holding out for an all estuary or all lake option will continue to prevent the allocation of funds sufficient to make something happen here. Choosing DELI will get the funds flowing.

In the spirit of full disclosure, if I had to choose between an all lake vs. all estuary alternative, I'd choose the estuary. But that's the thing–no one has to make that choice anymore because DELI is a viable compromise that can actually move things forward and break the stalemate that gives us the unflushed toilet we now have washing up against the shores of our urban core.

Asking this community to continue to live with the existing conditions on Capitol Lake is like asking us to eat barf with a smile. DELI is an alternative that will give us instead a clean, swimmable lake that will act as a beautiful reflective pool for the Capitol Dome, while a restored Estuary gets the vast majority of the existing, impounded landscape. How that is not a win/win/win situation over what we have now for all involved (public/politicians/environment), is a mystery to me. If you feel the same, please step up and make your voice heard. It's time to finally decide to get something done and stop just talking about what it is we should do.

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April 2016

Public Comment

There is currently a public process underway to determine the future outcome of Capitol Lake. A committee has been formed that includes the Squaxin Island Tribe, Cities of Olympia and Tumwater, Port of Olympia, and Thurston County. This committee will meet often throughout 2016, and will provide specific opportunity for public input on various aspects. One of these will be the choice of whether we focus management towards either a freshwater lake (CLIPA), a saltwater estuary (DERT) or a dual estuary/lake idea (DELI). If you have a preference, please make your voice heard.

Contact Department of Enterprise Services (DES)

This DELI document is posted on the DES webpage. Comments about DELI can be emailed to DES (DESCapitolLake@des.wa.gov).

There will also be an on-line survey available from 14 to 28 July 2016, with a planned Community Meeting about dual system options on 27 July 2016. Completing the survey and/or attending the Community Meeting will be the best way to have your say about DELI.

Attend Public Meetings

Location: 1500 Jefferson, Olympia (DES headquarters); Rooms 1213 or 2208; 9:30 to 11:30.

Executive Work Group Meeting 2016 Dates: (all Fridays) 22 April; 27 May; 24 June; 22 July; 19 August; 30 September; 28 October; 16 December (pretty boring; no option for public comment)

Public Comment Meetings (all Wednesdays): 27 April; 1 June; 29 June; 27 July; 24 August; 5 October. (Good opportunity to get on record.)

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