

A photograph of a wooden pier extending into a calm lake. The sun is low in the sky, creating a bright reflection on the water and casting long shadows of the pier's railings onto the deck. Two people are standing on the pier in the distance, looking out over the water. The background shows a line of trees under a clear blue sky.

Rosland Park Stormwater Filtration BMP- Project Update

Nine Mile Creek Watershed District
November 18, 2020

Janna Kieffer, PE

Three alternative design concepts under consideration

Alt Concept 1- recirculation system

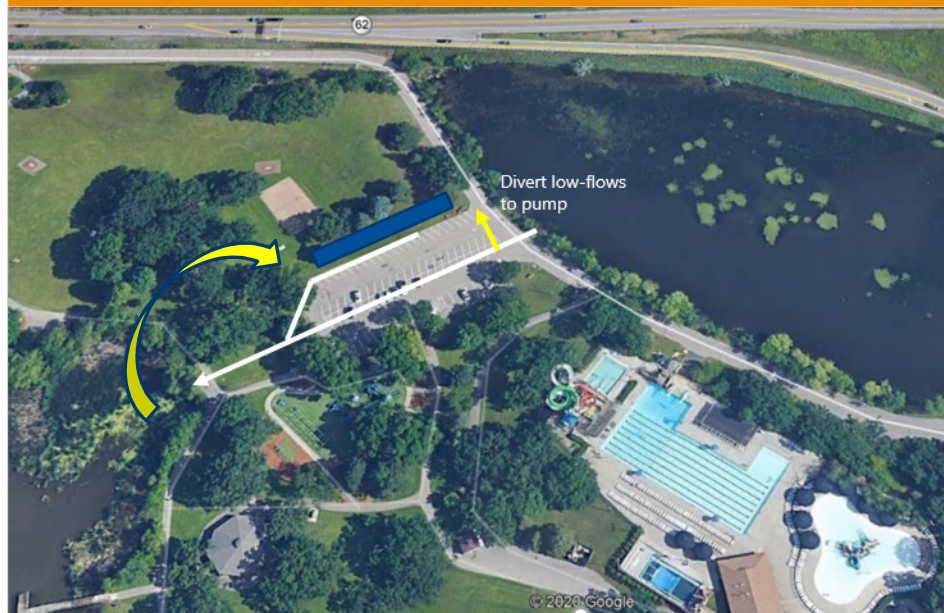


Alt Concept 2- divert low flows to pump/filtration BMP

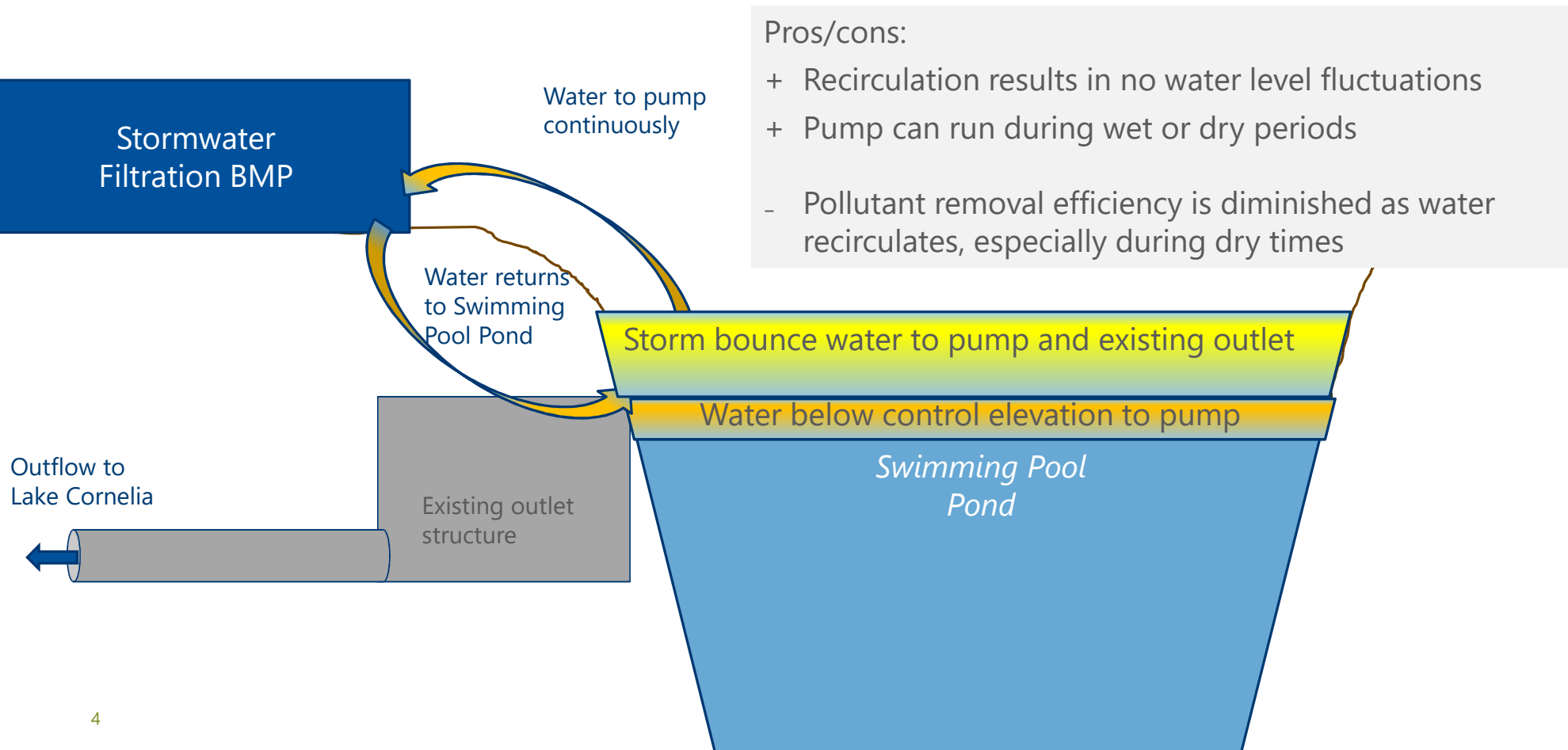


Three alternative design concepts under consideration

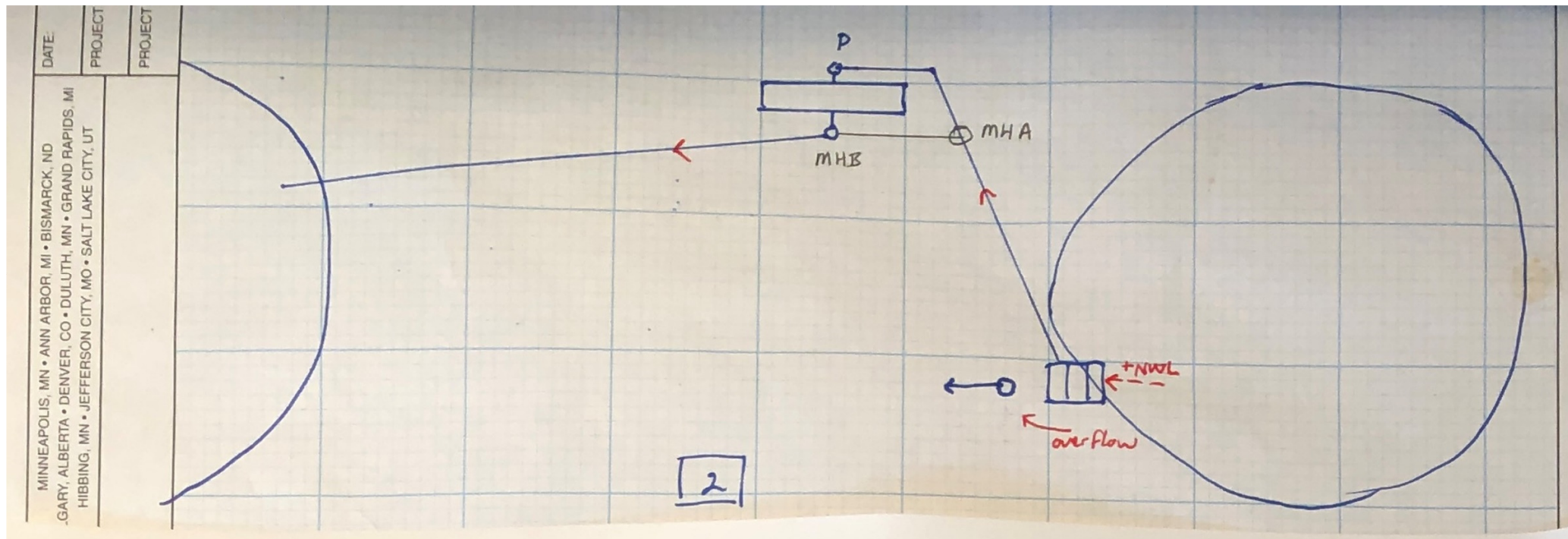
Alt Concept 2A- divert low flows to pump/filtration BMP + Recirculation from Lake Cornelia during dry periods



Alternative Concept #1- recirculation system



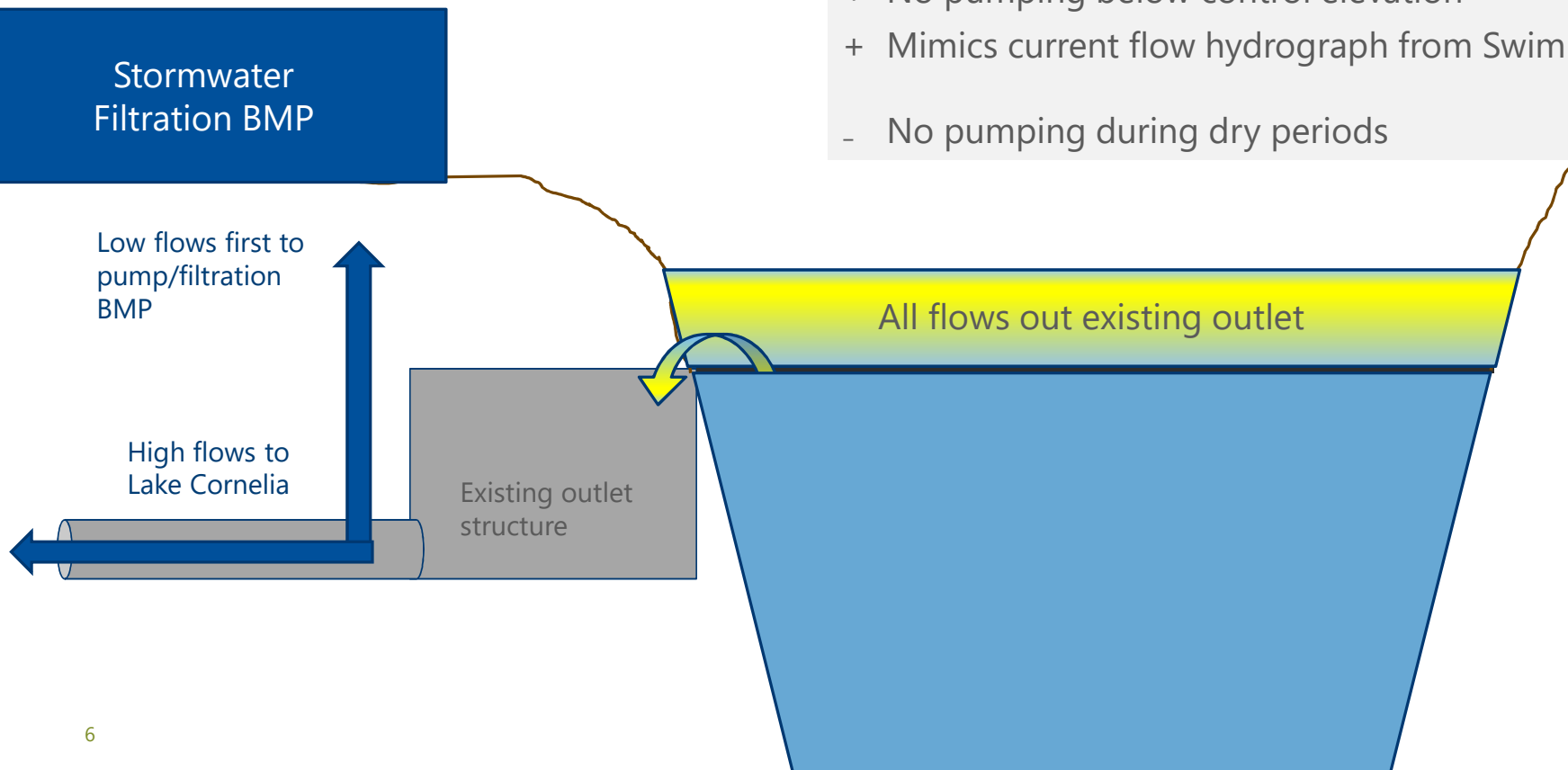
Alternative Concept #2- Divert low flows first to pump/filtration BMP



Alternative Concept #2- divert low flows first to pump/filtration BMP

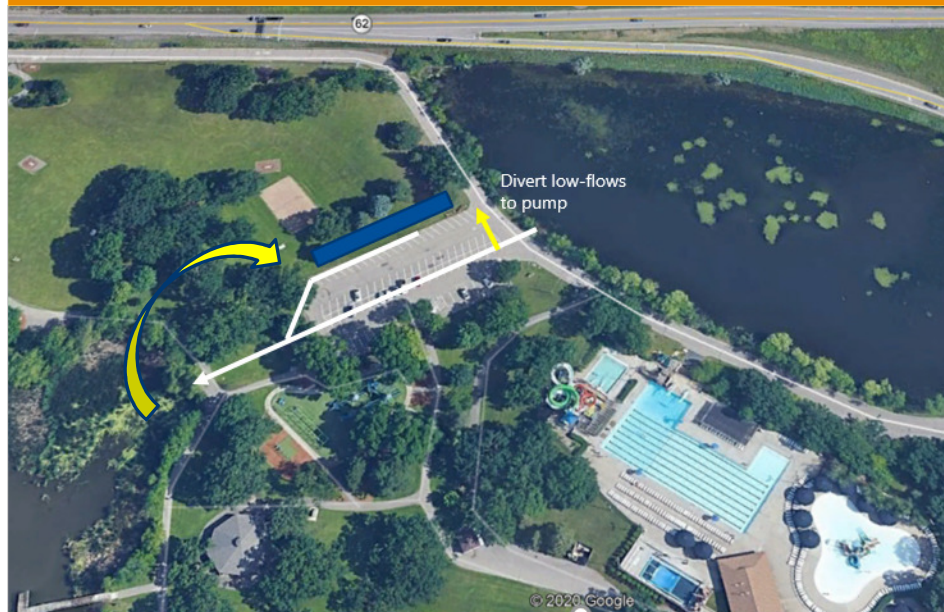
Pros/cons:

- + No pumping below control elevation
- + Mimics current flow hydrograph from Swimming Pool Pond
- No pumping during dry periods



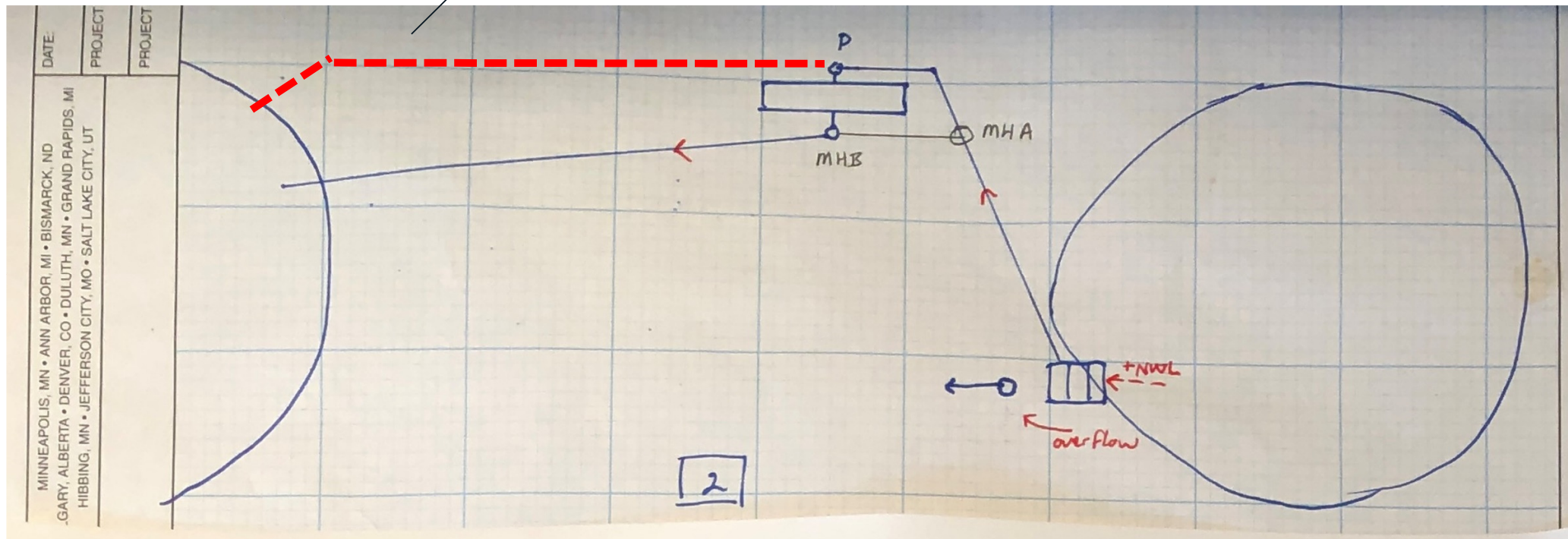
Alternative Concept #2A

Alt Concept 2A- divert low flows to pump/filtration BMP + Recirculation from Lake Cornelia during dry periods



Alternative Concept #2A- Divert low flows first to pump/filtration BMP + Recirculate from Lake Cornelia during dry periods

Install secondary intake from Lake Cornelia to continue treating water during dry periods to improve overall pollutant removal



Opinion of Cost Comparison

Design Concept	Concept-Design Opinion of Total Cost for Design/Construction	Concept-Design Opinion of Total Cost Range (-15%, +20%)
Feasibility Study (June 2020)	\$744,000 \$854,000	\$632,000 - \$892,000
Design Concept #1- Swimming Pool Pond Recirculation	\$998,000	\$849,000 – \$1.2 million
Design Concept #2- Divert low flows to pump/filtration BMP from Swimming Pool Pond	\$1.1 million	\$896,000 – \$1.3 million
Design Concept #2A- Divert low flows to pump/filtration BMP from SPP + Recirculate from Lake Cornelia during dry periods	\$1.2 million	\$982,000 - \$1.4 million

Opinion of Cost Comparison

Design Concept	Concept-Design Opinion of Total Cost for Design/Construction	Concept-Design Estimate of Total Cost for Design/Construction
Feasibility Study (June 2020)	\$744,000 \$854,000	
Design Concept #1- Swimming Pool Pond Recirculation	\$998,000	\$847,000
Design Concept #2- Divert low flows to pump/filtration BMP from Swimming Pool Pond	\$1.1 million	\$896,000 – \$1.3 million
Design Concept #2A- Divert low flows to pump/filtration BMP from SPP + Recirculate from Lake Cornelia during dry periods	\$1.2 million	\$982,000 - \$1.4 million

Cost Estimate Difference
 ~\$110,000 for backwash of vault system

- Increased filter media efficiency
- Decrease intense maintenance needs

Opinion of Cost Comparison

Design Concept	Concept-Design Opinion of Total Cost for Design/Construction	Concept-Design Opinion of Total Cost Range (-15%, +20%)
Feasibility Study (June 2020)	\$744,000 \$854,000	
Design Concept #1- Swimming Pool Pond Recirculation	\$998,000	
Design Concept #2- Divert low flows to pump/filtration BMP from Swimming Pool Pond	\$1.1 million	\$896,000 – \$1.3 million
Design Concept #2A- Divert low flows to pump/filtration BMP from SPP + Recirculate from Lake Cornelia during dry periods	\$1.2 million	\$982,000 - \$1.4 million

Cost Estimate Difference
 ~\$150,000 for additional piping, structures, bituminous removal/install, and filter media adjustments

Opinion of Cost Comparison

Design Concept	Concept-Design Opinion of Total Cost for Design/Construction	Concept-Design Opinion of Total Cost Range (-15%, +20%)
Feasibility Study (June 2020)	\$744,000 \$854,000	\$632,000 - \$892,000
Design Concept #1- Swimming Pool Pond Recirculation	\$998,000	
Design Concept #2- Divert low flows to pump/filtration BMP from Swimming Pool Pond	\$1.1 million	
Design Concept #2A- Divert low flows to pump/filtration BMP from SPP + Recirculate from Lake Cornelia during dry periods	\$1.2 million	\$982,000 - \$1.4 million

Cost Estimate Difference
 ~\$250,000 for outlet structure modifications, additional piping, structures, bituminous removal/install, filter media adjustments

Opinion of Cost Comparison

Design Concept	Concept-Design Opinion of Total Cost for Design/Construction	Concept-Design Opinion of Total Cost Range (-15%, +20%)
Feasibility Study (June 2020)	\$744,000 \$854,000	\$632,000 - \$892,000
Design Concept #1- Swimming Pool Pond Recirculation	\$998,000	\$849,000 – \$1.2 million
Design Concept #2- Divert low flows to pump/filtration BMP from Swimming Pool Pond	\$1.1 million	
Design Concept #2A- Divert low flows to pump/filtration BMP from SPP + Recirculate from Lake Cornelia during dry periods	\$1.2 million	

Cost Estimate Difference
 ~\$100,000 for additional piping, structures, bituminous removal/install, erosion control

Pollutant removal estimates

- Several key design factors that will drive pollutant removal
 - Frequency and duration of pumping
 - Balance between maximizing water treated and allowing filter media to dry out
 - Phosphorus removal efficiency
 - Dependent on filtration media
 - Amount of phosphorus in water to be treated (and what form it is in)
- Some uncertainty in these factors will remain until system is operational (experimental)

Cost/Benefit Comparison

Design Concept	Concept-Design Opinion of Total Cost for Design/Construction	Concept-Design Average Pounds of Total Phosphorus Removed	Cost/Benefit Range
Feasibility Study (June 2020)	\$744,000	22	\$2,200
Design Concept #1- Swimming Pool Pond Recirculation	\$998,000	7 - 17	\$3,600 - \$8,900
Design Concept #2- Divert low flows to pump/filtration BMP from Swimming Pool Pond	\$1.1 million	6 - 17	\$3,800 - \$10,800
Design Concept #2A- Divert low flows to pump/filtration BMP from SPP + Recirculate from Lake Cornelia during dry periods	\$1.2 million	14 - 43	\$1,600 - \$5,000