

## Hydrocarbon Mitigation Technologies Investigated

Technology	Estimated Cost	Comments
Powdered Activated Carbon	\$3M to \$5M	<b>Powered Activated Carbon for primary hydrocarbon treatment is the recommended option.</b> Cost includes the design and construction of a new building near the existing WTP intake to house the PAC silos and dosing system. Costs are based on a system that can dose 300 mg/L into a flow of 150 ML/d. Does not include the cost to load the Carbon (see below).
Granular Activated Carbon – media replacement only	\$1.5M to \$4.0M	Cost includes replacement of the anthracite media in the existing filters. <b>This is a good back up or secondary option for hydrocarbon removal but is not recommended as the primary means</b> of mitigating the impacts of a hydrocarbon spill upstream of the WTP.
Granular Activated Carbon contactors	\$4.0M to \$15.0M	Cost includes the design and installation of standalone Granular Activated Carbon contactors for primary hydrocarbon treatment. This is a very expensive option with limited value to the City and is <b>not recommended.</b>
Dissolved Air Flotation	\$8M to 12M	Cost includes a retrofit into the existing stilling basin, 150 ML/d capacity (20 m/h loading rate). Additional operational and maintenance costs associated with this equipment. This equipment does not provide the City with any significant additional benefits compared to the existing processes in place and is <b>not recommended.</b>
Advance Oxidation (Ozone/Peroxide)	\$20M to \$35M	Cost includes retrofitting the stilling basin as an ozone contactor, which requires a special coating, along with an oxygen tank and the ozone generation equipment. This is a very expensive option with limited value to the City and is <b>not recommended.</b>
Advanced Oxidation (UV/Peroxide)	\$4M to \$15M	Cost includes the addition of new high-dose inline Ultraviolet reactors, along with the potential need to build a new building to house the UV reactors. This is a very expensive option with limited value to the City and is <b>not recommended.</b>
In-River Monitoring	\$10,000 to \$50,000	Cost includes the purchase of in-river monitoring equipment. This is very cost effective and can provide the City with additional water quality information and is <b>recommended.</b>