



Meeting Q&A

**Nov. 13 & 20, 2019 City Council Meetings
Implementation Resolution**

Updated: 11/21/19

1. What is a Confidence Rating and how does it work? When will we have better accuracy range on cost estimates?

- Cost estimates in the early stages of all City projects use a Project Estimate Confidence Level Rating Index whenever Council approval is necessary before the project scope and specifications are fully known. Identifying a specific level of confidence on project estimates helps to better reflect the uncertainties that go with various levels of project development.
- When the design and engineering phase is less than 50% complete, the term “low confidence estimate” is used and project contingencies (including project management, design, engineering, plus construction) may range up to or exceed 50%.
- As the project scope and specifications become more defined, total project contingencies are reduced, and the range of project costs narrows. Project estimate contingencies are 10%-15% when the project reaches 90% or greater completion of the design and engineering phase.
- It is normal to have a low confidence estimate at the beginning of a major construction project, before the project has been designed. The first estimates given to Council for the Powell Butte Reservoir and later the Kelly Butte Reservoir were both low confidence.
- The Water Bureau is nearing completion of the planning phase of the project, which includes a full year of engineering studies, investigations, analyses, workshops, and tours of other cities’ water treatment facilities. The purpose of this work is to determine the right scope of the project, consistent with Water Bureau and customer values, and to serve as a basis for the first substantive cost estimate as well as the beginning of the design phase. The resulting recommendations and estimate are before the Council for consideration and direction.
- The Confidence Level Rating Index applies to estimates during planning and design. The design contract for the Bull Run Treatment Project includes a not-to-exceed maximum ceiling, this portion of the project total will be fixed and not subject to future escalations. The construction contract will have a guaranteed maximum price, coming in 2022, at which point all project costs will be known.
- Resources:
 - [ADM-1.13 - Assigning Confidence Ratings to Project Cost Estimates](#)
 - [Resolution No. 36430, adopted by City Council July 26, 2006, link to the efiles archive](#)

2. Why has the cost changed so dramatically from 2017?

- The original range provided in 2017 was based on the best information obtained from other communities that had built plants in the recent past.
- When the Oregon Health Authority (OHA) revoked the variance from treatment the Water Bureau did not have an existing planning study nor time to prepare a planning study on which to base a more detailed estimate. Filtration technology, site location, and capacity of the facility had not been evaluated at the time.
- In 2018, evaluations of technology, site, and capacity were completed and confirmed by the Council. In 2019, more detailed planning work was completed to develop the project options and costs.
- The Portland construction market continues to be very busy with many projects paying a premium for labor; this is reflected in the updated costs.

3. What is the difference between UV and Filtration? What alternatives does the City have to comply? Pros and cons?

- UV, or ultraviolet light, is a disinfection technique with a single purpose: to inactivate micro-organisms in water such as *Cryptosporidium*. After UV treatment, the micro-organism is still in the water but is no longer infectious. Filtration works by removing *Cryptosporidium* and other micro-organisms from the drinking water.
- UV and filtration were presented to City Council as options to comply with the Long Term 2 Enhanced Surface Water Treatment Rule, in 2017. The comparison evaluated costs and benefits of the two options to comply with state and federal water quality rule. Estimates included \$105M for UV and \$500M for filtration. Both estimates were based on earlier plans and comparisons to what other utilities have spent.
- Filtration, in addition to removing *Cryptosporidium*, provides many other significant water quality benefits: provides best pathogen protection, reduces disinfection byproducts, addresses high turbidity events (fire or storms), helps address algae concerns, keeps sediment out of the distribution system, reduces reliance on groundwater, and better prepares us to address future regulations or emerging contaminants.
- These benefits were the reasons for selecting filtration in 2017 and they are still valid today.
- The Portland Water Bureau is required to have the Bull Run Filtration Facility online by September 2027 as part of the bilateral compliance agreement with the OHA.
- Ozone and chlorine dioxide had been evaluated as stand-alone treatments for *Cryptosporidium*.

- Ozone was considered in the past as a stand-alone *Cryptosporidium* treatment but would require very high doses in the cold water from Bull Run to meet the required disinfection credit.
- Chlorine dioxide has been evaluated in the past as an alternative for *Cryptosporidium* inactivation. The required contact times for cold water cannot be achieved without exceeding disinfection byproducts rules for chlorite and would require huge amounts of storage to be constructed.

4. How does this facility compare to others around the country?

- The recommended option will address many types of risks and contaminants including harmful algal blooms. The recommended option includes ozone, flocculation, sedimentation, and filtration to achieve this goal.
- Salem had an algal event in 2018. They have a slow sand filtration plant. Slow sand filtration systems are cleaned manually, and the algae event clogged the filters requiring continuous cleaning. Slow sand filtration does not provide a good barrier against algal toxins and therefore they were not sufficiently removed. Salem is now adding ozone ahead of their filter to deal with the algal toxins and improve filtration performance.
- Resources:
 - See attached list of what other utilities with unfiltered supplies have done to comply with LT2.

5. What is being done to address the reliability of the rest of our system (both in town and between watershed and town)?

- The Water Bureau is continuously enhancing the resilience of its system. Many projects that are part of the planned capital program work toward this goal.
- The Water Bureau has been investing in seismic improvements to meet the goals of the Oregon Resilience Plan. This work will continue as the filtration facility is built.
- Pipes have been damaged and taken out of service by landslides. In 1996, two pipes near headworks were damaged by a landslide. These pipes had to be shut down while repairs were completed. Water continued to town in the third pipe.
- This project includes replacement of some vulnerable pipe segments.

6. What is the difference between using consultants on this project vs. internal staff?

- Consultants are needed for two reasons: 1) since the Water Bureau does not have a filtration facility now, internal expertise is limited; 2) the Water Bureau does not have enough employees to design a project of this size; since this is a one-time project it is most efficient to hire consultants.

- Design costs are similar for all the filtration facility options. The number and type of processes are similar in all the treatment options and it is the number and type of processes that drive costs, not size. The smaller facilities still require the same number of plan sheets and specifications as a larger facility.

7. What is PWB doing to reduce the rate impacts?

- Applying for low interest loan from the Environmental Protection Agency through the Water Infrastructure Financing and Innovation Act (WIFIA).
- Enhancing low income assistance programs.
- Delaying other projects to smooth rate impacts.
- Looking at planning and design opportunities, such as decreasing the capacity from 160 mgd to 145 mgd, throughout for cost savings opportunities.
- The projected typical residential monthly water bills over time:

Water Bill Increase	FY20-21	FY21-22	FY22-23	FY23-24	FY24-25	FY25-26	FY26-27	FY27-28
Current Forecasted Water Bill	45.25	48.61	52.20	56.07	60.22	64.67	69.46	74.60
*Recommended Option Increase	0.51	1.09	1.77	2.55	3.44	4.46	5.62	6.93
Total Estimated Water Bill	\$ 45.76	\$ 49.70	\$ 53.97	\$ 58.62	\$ 63.66	\$ 69.13	\$ 75.08	\$ 81.53

- The projected extreme low-income residential monthly water bills over time:

Water Bill Increase	FY20-21	FY21-22	FY22-23	FY23-24	FY24-25	FY25-26	FY26-27	FY27-28
Current Forecasted Water Bill	9.05	9.72	10.44	11.21	12.04	12.93	13.89	14.92
*Recommended Option Increase	0.10	0.22	0.35	0.51	0.69	0.89	1.12	1.39
Total Estimated Water Bill	\$ 9.15	\$ 9.94	\$ 10.79	\$ 11.72	\$ 12.73	\$ 13.82	\$ 15.01	\$ 16.31

**Recommended Option Increase (after absorbing 25% per Mayor’s budget directive)*

8. What are the benefits of doing the Recommended Option now compared to the Minimum Compliance option?

- Ozone improves filtration resilience to and recovery from forest fires, turbidity, algal toxins, and other water quality events.

- Longer finished water pipes replace aging infrastructure.
- Longer raw water pipes ensure adequate gravity flow through the facility.
- Two finished water and raw water pipes enhance resilience against something happening to one pipe and allow one pipe to be taken out of service for maintenance.
- Completing all the work at one time is the lowest cost option. To come back and add to or update an operating facility later increases costs and complexity.
- Phasing the project over a longer period has a much greater impact in the neighborhood.

9. How will this project include DMWESB contracting opportunities?

- This project will have a Community Benefits Agreement to support creating opportunities for DMWESB firms on the construction of the filtration facility and pipelines.
- The professional services contracts are working to achieve the City's aspirational goals. The Program Management consultant has committed to achieve 23% participation. The Design consultant has committed to achieve 20% participation.
- The Water Bureau is achieving, on average, 22% participation across all projects.

10. Why the change from a capacity of 160 to 145 million gallons per day (mgd)?

- It has been part of our process to find opportunities to save costs and reduce rate impacts.
- The Water Bureau evaluated future demand projections in 2017, this forecast looked at 20-year projections for demand.
- These demand projections were used to evaluate the size of a filtration facility and determined that a peak day capacity range of 145 mgd to 160 mgd would meet these future projections.
- During the September 2019 Council work session, three options were presented, two that included 145 mgd and one at 160 mgd.
- Building to the lower end of the range provides the best balance of capacity and cost benefit.

11. What chemicals or other treatment processes will be used at the filtration facility and why?

- Chlorine will continue to be used. Chlorine is a proven, widely used, strong disinfectant that is very effective at removing viruses and many pathogens (but not Cryptosporidium) and can do so relatively quickly, meaning smaller contact basins are needed.
- Ammonia will continue to be used. Ammonia is added to form chloramines which help maintain a chlorine residual longer as water travels through PWB's distribution system to keep the water safely disinfected. This has been done since the 1930s.
- Ozone as proposed is not a redundant treatment process to filtration. Ozone is included in the Recommended Option for its proven benefits to oxidize organics (including those released post-forest fire) which reduces disinfection byproducts and improves taste and odor. Ozone also improves filtration performance, reduces overall chemical use, and addresses algal toxins.
- Metal salts (based on aluminum or iron) and polymers are widely used in drinking water treatment to promote coagulation and flocculation, which allows very small particles to come together so they can be removed by sedimentation and filtration. All chemicals used in water treatment are regulated by EPA and OHA, which reference the NSF International (formerly National Sanitation Foundation) Standard 60 (Drinking Water Treatment Chemicals – Health Effects), including maximum allowable doses and limits in the finished water.
- Municipal drinking water residual solids are not hazardous waste. Solids are typically sent to non-hazardous landfills where they are used as daily cover or incorporated in a beneficial use program.

12. What is the status and purpose of the Site Advisory Group?

- The Site Advisory Group was started in October 2019 to help develop a Bull Run Filtration Good Neighbor Agreement by providing an independent community perspective on the facility design, construction, and ongoing operation.
- In November 2019, eight of the 16 Site Advisory Group members sent a letter to the Portland Water Bureau and City leadership stating they would no longer participate in the process. Prior to their departure, the Portland Water Bureau opened membership to other community members that may be interested. The remaining Advisors will evaluate new membership at their January meeting.
- The Water Bureau is committed to keeping site neighbors informed and involved throughout the project and will continue the monthly Site Advisory Group meetings as information-sharing opportunities if a formal Good Neighbor Agreement can't be reached.

13. When were neighbors contacted about this project?

- Adjacent neighbors received a [letter in January 2018](#) informing them that a site selection process was underway. In October 2018, a [newsletter mailer](#) on the project, timeline, and an invite to attend the November 2018 community forum was sent to adjacent neighbors with encouragement to notify other interested community members.

- On November 8, 2018, the Water Bureau hosted a community forum with Commissioner Amanda Fritz, Water Bureau staff, and community partners followed by a small information session on November 30, to dive deeper into the details with adjacent neighbors. Nearly all adjacent neighbors attended.
- Outreach and communication efforts have highlighted various project milestones, beginning in early 2018 and increasing throughout the end of 2018 and this year. We acknowledge we could have done more with initial outreach, and we have worked hard to increase communication with community members. This is reflected in our [long timeline of outreach](#) and communications activities since August 2018.

14. What actions has the City/PWB taken so far to exercise eminent domain?

- No actions have been taken to exercise eminent domain related to the filtration facility.
- To date the Water Bureau has only worked with willing sellers.
- Eminent domain actions may be needed in the future along pipeline routes. The Water Bureau is working to first evaluate options in public rights-of-way and easements. However, additional easement acquisition may be needed and City Council will decide whether to authorize eminent domain, as is done for other City projects.
- The Water Bureau expects to determine pipeline corridors in 2020 and final alignments and additional property needs in 2021.

15. What does PWB plan to do if private property is damaged in project activities?

- Property owners will be compensated for damage caused by the Water Bureau or their contractors.
- The Water Bureau continues to work with the family referenced in the [Oregonian article](#) and as indicated by the family in the article, there is a positive working relationship to resolve this issue.

16. What is the burden to rate-payers if wholesalers do not renew contracts with the Water Bureau?

- We want to retain our wholesale customers and value our relationship with them. We are starting discussion with a group of wholesale customers on the next contracts. We would like to offer a menu of services, including being their suppliers in an emergency.
- At this time only Tualatin Valley Water District (TVWD) has given us clear indication that they are departing, and forecasted rates include the impact of anticipating their departure June 2026.

- Wholesaler revenue currently makes up 10 percent of water sales revenue. With TVWD's departure, wholesaler revenue will only make up 6 to 7 percent of water sale revenue. If other wholesalers were to depart, the financial impact would be manageable.
- According to the PSU Population Center, between 2010 and 2035, Portland is projected to add approximately 231,000 new residents (110,148 households) to the roughly 620,000 people who live here. This project will ensure safe and abundant water for Portlanders for generations to come.

17. Can the Water Bureau obtain required land use permits for the project at this site?

- Applicable land use codes allow the proposed use as a conditional use upon a showing that the project meets the approval criteria, which generally relate to consistency with the area and imposing conditions of approval related to any construction and operational impacts on surrounding areas, primarily focused on impacts such as: noise, odor, traffic, visual, and farm operational impacts, if any.
- The proposed facility, once constructed, will not generate noise above County noise standards, will not generate any significant odors, will have insignificant traffic impacts, and will be designed with site grading, screening, landscaping, and architecture to fit within the rural area. The conditions imposed will ensure best practices are used to mitigate any identified impacts during construction and operation of the facility.
- The Portland Water Bureau is committed to implementing best practices to limit impacts and are working with the local community on a Good Neighbor Agreement and other measures to address them. Because the external impacts of the proposed facility are minimal, we believe the proposed use and development will be approved under the county land use codes.

18. Is the site selection still valid?

- Six [potential sites](#) for the filtration facility were evaluated in 2017-18 using siting criteria that included: works for gravity flow; reasonably close to existing and future pipelines; adequate area, reasonable slopes, and suitable geologic conditions; already owned by the City of Portland; and ability to meet the compliance schedule. The Carpenter Lane property was selected for the new filtration facility site because it was the only property that met all siting criteria.
- The Portland Water Bureau purchased the Carpenter Lane site in 1975 to use for future water system facilities. The analysis can be found in the Bull Run Filtration Projects [Preferred Alternatives Report](#).



**Bull Run
TREATMENT
PROJECTS**

Bull Run Filtration

Summary of Unfiltered Water Supplies

City/Utility	Watershed	Treatment Technology and Date Operational	Treatment Notes
Seattle Public Utilities, Seattle, WA	Tolt	<ul style="list-style-type: none"> Filtration – 2001 Ozone - 2001 	<ul style="list-style-type: none"> Flashy turbidity events require filtration <i>Cryptosporidium</i>, turbidity, organics and taste and odor removal are the main treatment objectives Filtration improves system reliability by allowing Seattle to reduce watershed shutdowns due to storm-related turbidity events, providing a more reliable supply to customers
	Cedar	<ul style="list-style-type: none"> Ozone – 2004 UV – 2004 	<ul style="list-style-type: none"> <i>Cryptosporidium</i>, fecal coliform, and taste and odor removal are the main treatment objectives. Lower organics and turbidity than the Tolt During turbidity events, flows can be diverted around the regulating intake reservoir which allows them the ability to reduced turbidity coming into their treatment system.
Tacoma Water, Tacoma, WA	Green River	<ul style="list-style-type: none"> Ozone – 2007 Filtration 2015 	<ul style="list-style-type: none"> Ozone originally constructed for taste and odor control due to algae and organic material, color removal, and disinfection Considered UV and filtration for treatment of <i>Cryptosporidium</i> to comply with LT2 rule Filtration selected due to additional benefits of sediment removal and organics removal to reduce disinfection byproducts
Metro Vancouver, Vancouver, British Columbia	Seymour/Capilano	<ul style="list-style-type: none"> Filtration – 2009 UV - 2009 	<ul style="list-style-type: none"> Filtration selected due to flashy turbidity and some algal issues UV provides additional microbial disinfection Filtration reduces amount of chlorine required to maintain water quality in distribution system Filtration also increases reservoir utilization by allowing lower drawdown, increasing system resilience for drought, climate change, and growing population
	Coquitlam	<ul style="list-style-type: none"> Ozone - 2000 UV - 2014 	<ul style="list-style-type: none"> <i>Cryptosporidium</i> and other microbial reductions are the main treatment objectives Stable low turbidity, low organics and few algae issues Currently evaluating filtration options
Massachusetts Water Resources Authority, Boston, MA	Quabbin Wachusett	<ul style="list-style-type: none"> Ozone – 2005 UV - 2014 	<ul style="list-style-type: none"> Ozone constructed to reduce disinfection byproducts, remove algae-related taste and odor, and <i>Cryptosporidium</i> Constructed UV in 2014 for <i>Cryptosporidium</i> Both watersheds have low turbidities but total coliform detections at one time threatened their unfiltered status; reservoirs manage turbidities better because they are much larger than Portland's
New York Department of Environmental Protection (DEP), New York City, NY	Croton	<ul style="list-style-type: none"> Filtration - 2015 UV - 2015 	<ul style="list-style-type: none"> <i>Cryptosporidium</i> and other microorganisms, total organic carbon, algae, reduction of organics and disinfection byproducts, color and taste and odor removal are the main treatment objectives
	Catskill/Delaware	<ul style="list-style-type: none"> UV - 2013 Seasonal coagulant addition 	<ul style="list-style-type: none"> Fairly stable water quality with lower total organic carbon than Croton supply Flashy turbidity events require addition of coagulant; reservoir and water system infrastructure allow chemical addition to settle out turbidity, but this practice has been flagged by the EPA and DEP has agreed to dredge the reservoirs when DEP adds filtration for this supply DEP is currently piloting filtration processes
San Francisco Public Utilities Commission, San Francisco, CA	Hetch Hetchy	<ul style="list-style-type: none"> UV - 2012 	<ul style="list-style-type: none"> <i>Cryptosporidium</i> inactivation is the main treatment objective Turbidity not generally a concern due to the nature of their watershed, which consists of granite cliffs and shallow soils Rim Fire in 2013 did not require shut down of the system; fire may have caused elevated total organic carbon and increased disinfection byproducts but were still manageable because of the nature of their watershed