MEMORANDUM OF AGREEMENT

The City of Tacoma (**City**) and WestRock CP, LLC (**WestRock**) enter into this Memorandum of Agreement (**MOA**) for the purpose of setting forth the process for determining the feasibility of a project to provide reclaimed water to WestRock as an alternative to the use of potable water from City for process operations.

RECITALS

WHEREAS, the City, acting by and the through the Tacoma Environmental Services Department (**ES**), operates the Tacoma Central Treatment Plant (**CTP**), which is subject to increasing regulatory requirements and upgrades needed for current and future environmental compliance, and

WHEREAS, ES is considering the development of a reclaimed water project (**Project**) as an alternative to discharging treated effluent into Commencement Bay and has engaged the services of a consultant to assist in a preliminary evaluation of the Project's costs and permitting requirements associated with up to eight Project alternatives (**Preliminary Evaluation**), and

WHEREAS, WestRock is now receiving from the City, acting by and through Tacoma Public Utilities (**TPU**), the majority of its water supply from the City's municipal potable water supply for WestRock's Tacoma Mill process operations, and

WHEREAS, the cost of providing potable water service has increased over the past 20 years due to capital improvements made to TPU's municipal potable water supply system, and

WHEREAS, WestRock does not require treated, potable water for process use, and is seeking an alternative to TPU's potable water supply, and

WHEREAS, the City supports undertaking the Preliminary Evaluation in an effort to find a solution for the needs of both parties and desires to assist in evaluating and possibly developing the supply of reclaimed water, and

WHEREAS, time is of the essence to evaluate an alternative water supply to the WestRock Mill process operations, and

WHEREAS, the purpose of this MOA is to agree on a process and a schedule for a Preliminary Evaluation of reclaimed water supply options and does not bind the parties to obligations beyond the process set forth herein.

AGREEMENT

Based on the above Recitals, the parties agree as follows:

A. The parties shall make decisions in phases for the Preliminary Evaluation and the feasibility study of the Project. Each party shall fully participate in the phases that will allow for review, final decisions and agreements based upon the schedule as described below.

B. ES has finalized a scope of work for the Preliminary Evaluation (**Scope of Work**) attached hereto as Exhibit A. WestRock shall cooperate with and timely provide information and records to the City as reasonably requested by the City for purposes of completion of the Preliminary Evaluation. If WestRock cannot provide the requested information within three (3) weeks of the date of the request, WestRock will inform the City as to why it cannot meet that timeframe and when it can provide the requested information. The schedule below may need to be adjusted if WestRock cannot provide the requested information within three weeks.

C. Phase 4 of the scope of work (Business Case Evaluation) provides for screening of the alternatives developed as part of phase 2 scope of work (Alternatives Development). The purpose of the screening is to select the alternatives considered most feasible to be included in the business case evaluation (BSE). At the conclusion of the screening, ES will provide a report to WestRock, describing the selected alternatives to be included in the BSE. At the request of WestRock, ES and its consultant will meet with WestRock, give a briefing of the report and the screening process, and provide an opportunity to ask questions and provide input.

D. The Parties anticipate that the draft Preliminary Evaluation report ("Draft Report") will be made available for review and comment by no later than November 30, 2020. WestRock shall submit their comments to ES within 30 days following receipt of the Draft Report. If, after consideration of the submitted comments the Draft Report is revised, ES shall submit the revised Draft Report for final review. Comments by WestRock shall be submitted to ES within 15 days following receipt. ES shall then cause a final Preliminary Evaluation Report (**Final Report**) to be completed and provide a copy of the Final Report to the Parties.

E. The Parties shall, within 15 days following receipt of the Final Report, meet to develop and approve a schedule of meetings, exchange of information and tasks for the purpose of determining if one or more cost effective alternatives that have been identified in the Final Report, provide a mutual basis for the Parties' commitment to preparation of a long-term Feasibility Analysis meeting the requirements of WAC 173-219-180 (**Feasibility Analysis**). The parties shall fully cooperate with each other in regard to developing and approving the schedule and providing required information.

F. In the event that the Parties reach mutual agreement upon the basis for a commitment to the preparation of a Feasibility Analysis, the terms and conditions of such commitment

shall be set forth in writing as an amendment to this MOA or a separate MOA and may include, among other things, terms and conditions for review of the scope of work, a schedule for completion of the Feasibility Analysis, provisions for an exchange of information and cooperation of the Parties, provisions for allocation of costs and liabilities, provisions for the guarantees of the parties, and the material terms of a reclaimed water service agreement.

G. Notifications. The following persons shall be the primary contacts for the Parties:

City of Tacoma	WestRock
Teresa Peterson	Bruce Martin
Glen George	

H. The purpose of this MOA is to commit the Parties to a process for developing the Preliminary Evaluation. The MOA does not commit the City to construct the Project and does not commit WestRock to purchase the reclaimed water. All costs necessary to complete each party's actions in this MOA will be covered separately by each party with no reimbursements.

I. The Parties agree to collaboratively and in good faith exercise their reasonable best efforts to implement the provisions of this MOA, and, for such purpose, each Party will, at the request of the other Party, promptly provide such information, assistance or take such action as is reasonably necessary to implement any provision of this MOA.

J. The Parties do not intend to create any third-party beneficiaries, and nothing in the MOA shall be deemed to create any third-party beneficiary relationships.

K. This MOA may be executed in one or more counterparts, each of which shall be deemed an original but all of which together shall constitute one and the same instrument.

L. This MOA begins on August 1, 2020, and shall terminate on August 20, 2023, but shall terminate if the Amended Water Supply Agreement is not extended or is otherwise terminated.

Tacoma Public Utilities

By_____
Name _____
Title_____

Tacoma Environmental Services
By_____
Name _____

Title_____

WestRock CP, LLC

By_____
Name _____
Title_____

EXHIBIT A

(*Scope of Work*)

CITY OF TACOMA CENTRAL TREATMENT PLANT RECLAIMED WATER EVALUATION

Exhibit A:

Scope of Services

Project Understanding

WestRock has approached the City of Tacoma (City) to express an interest in using Central Treatment Plant (CTP) treated effluent for process water uses at their mill located about 1.3 miles from the CTP site. Use of CTP effluent at WestRock would represent a beneficial reuse of reclaimed water and would be subject to Washington State Department of Ecology (Ecology) and Department of Health reclaimed water regulations. The City is considering two primary alternatives: 1) conveyance of Class B reclaimed water to WestRock and 2) production of Class A reclaimed water at the CTP for conveyance to WestRock or other potential users.

Potential benefits to the City related to providing reclaimed water to WestRock include:

- Delay or reduce the costs required to address nutrient discharge limits that may be imposed by Ecology. If treatment processes for the production of reclaimed water include nutrient removal, it may be possible to avoid needing to provide nutrient removal for the entire CTP flow.
- Delay the cost of an expansion of the existing CTP outfall to Commencement Bay.
- Provide a second point of discharge for the CTP to allow flows to be diverted from the existing outfall to facilitate periodic maintenance and inspection.
- Substantially reduce existing potable water use, providing additional capacity for Tacoma Water to serve other customers.

The goals of this project are:

1. Develop planning level cost estimates for the construction and operation of a reclaimed water facility, pump station(s), and pipeline to convey reclaimed water to WestRock or other users that may be identified,
2. Compare the costs of implementing nutrient removal at the CTP to the cost of producing and supplying reclaimed water to WestRock, and
3. Identify permitting issues that would need to be considered if the supply of reclaimed water to WestRock appears to be viable, for example NPDES permitting requirements for the discharge of CTP effluent to Puget Sound via the WestRock outfall.

Key assumptions for this evaluation include:

1. A complete Water Reuse Feasibility Analysis per Washington Administrative Code (WAC) 173-219-180 would be prepared under a separate scope of work if the economics for constructing a reclaimed water facility and/or a conveyance pipeline are found to be favorable.
2. It is assumed that any nutrient limits or other permit conditions imposed on the City's treatment plant discharges in the future will be such that the North End Treatment Plant (NETP) can remain in operation. This evaluation does not anticipate the increase in flows and loads to the CTP that would result if flows from the NETP were to be rerouted to the CTP.
3. The primary reclaimed water customer that has been identified to date is the WestRock facility. Two other potential customers at the Port of Tacoma have been identified and will be

included in this evaluation to identify a likely route for conveyance pipelines to these users and the associated costs.

APPROACH

As many as eight (8) reclaimed water production alternatives will be evaluated using the business case evaluation (BCE) tool following an initial screening of water quality and flow rate scenarios, as described below. The results of the BCE will be used to estimate the costs associated with providing reclaimed water to WestRock that would need to be recovered to make the project feasible.

Six phases will be undertaken to prepare this initial evaluation:

- Phase 100 – Background and Planning Assumptions
- Phase 200 – Alternatives Development
- Phase 300 – Cost Estimating
- Phase 400 – BCE Construction
- Phase 500 – Reporting
- Phase 600 – Project Management

PROJECT DESIGN

Phase 100 – Background and Planning Assumptions

The purpose of this phase will be to develop a project understanding and a set of planning assumptions to set the stage for the development of alternatives to be evaluated.

Specific tasks include:

1. Conduct two initial planning meetings, one with the City to review the project scope, confirm the alternatives to be evaluated and collect background data and a second with City and WestRock staff to collect information on intended reclaimed water uses.
2. Review and summarize existing CTP effluent water quality and temperature data. No additional sampling or flow monitoring will be performed within the scope of this project.
3. Evaluate the impact operation of the Peak Wet Weather Facility (PWWF) would have on the production of reclaimed water.
4. Summarize WestRock reclaimed water needs, as provided by WestRock, with respect to intended use, flowrate, variability, temperature and specific water quality parameters that they identify.
5. Review and summarize reclaimed water standards. Based on discussions with WestRock, develop a list of intended uses for reclaimed water and the class, flowrate and quality of reclaimed water required for each.
6. Review and summarize previous studies evaluating the capacity of the existing CTP outfall and the timing of a project to increase the outfall's capacity.
7. Based on an evaluation of nutrient removal alternatives for the CTP currently being prepared by Brown and Caldwell (BC), develop a Class 5 cost estimate for the treatment technology alternative initially identified as being most feasible to produce a total inorganic nitrogen effluent concentration of 8 mg/L for the entire CTP flow.
8. Based on an evaluation of side stream treatment alternatives for the CTP currently being prepared by BC, develop a Class 5 cost estimate for the alternative initially identified as being most feasible to treat filtrate flows from the CTP dewatering process.
9. Develop planning assumptions for the reclaimed water production and transmission system. Initial planning assumptions include the following:

a. WestRock will accept reclaimed water on a year-round basis. Usage during peak flow events at the CTP is critical to delay the need for additional capacity in the CTP outfall.
b. The preferred location for new reclaimed water facilities is at the northern end of the CTP site where the existing Transmission Maintenance and Customer Service Buildings are located. If the available space is not sufficient to site all of the required facilities, the additional space that is required will be identified. Evaluating alternative locations for reclaimed water facilities is not included in this initial scope of work.
c. The route of a new reclaimed water transmission pipeline will be along Portland Avenue East, as described in the 2006 BC Technical Memorandum - *Evaluation of Conveying City of Tacoma Central Treatment Plant (CTP) Secondary Effluent to the Tacoma Simpson Mill*. A second alternative to be evaluated will be the use of an existing unused 12- and 16-inch water main located along Portland Avenue.
d. The transmission pipeline will be extended to the WestRock entrance on Portland Avenue. Routing reclaimed water piping inside the WestRock facility will be the responsibility of WestRock. WestRock will indicate the water pressure required at the entrance to their property.
e. Flow projections for the CTP will be used to estimate the timing for a future outfall capacity expansion project. The City and WestRock will provide current flow data and projected flows that account for future growth, including estimates of variability in flow and water usage and diurnal curves.
f. WestRock will construct facilities to cool the reclaimed water as required for their process uses. No cooling of plant effluent on-site at the CTP will be necessary.
g. It is assumed that since the individual discharges at the City and WestRock outfalls are in compliance with existing discharge permits that the combined discharge would also be in compliance. A water quality standards attainment analysis of combined secondary treated effluent, process water, and cooling water discharge to Puget Sound via the WestRock outfall would be performed in subsequent planning stages.
h. Initial review of past plant operating data indicates that the Class B fecal coliform standard of 23 per 100 ml is not being met consistently. The City will provide effluent coliform data to assess compliance with Class B disinfection criteria. BC will prepare an assessment of the capacity of the existing disinfection system to meet Class B standards. It is assumed that no other treatment steps at the CTP will be required to meet Class B standards.

10. These assumptions will be confirmed with the City and WestRock prior to beginning subsequent phases of the project. BC will meet with the City to review the draft memo and gather input prior to finalizing the memo.

Deliverable:

- Draft and Final Planning Assumptions Technical Memorandum (TM) documenting the findings of the investigations described above and the associated planning assumptions.

Phase 200 – Alternatives Development

This phase will develop flow/water quality alternatives and select the alternatives to be evaluated as part of the BCE. Twenty (20) alternatives with different flow and water quality requirements will be developed initially:

Reclaimed Water Flow and Water Quality Alternatives Summary				
Reclaimed Water Quality	Reclaimed Water Flow			
	7.5 mgd4	15 mgd (with storage)5	Up to 15 mgd (no storage)6	21 mgd (no storage)6
Class B	1a	1b	1c	1d
Class A	2a	2b	2c	2d
Class A w/ nutrient removal1	3a	3b	3c	3d
Class A, enhanced2	4a	4b	4c	4d
Class A+3	5a	5b	5c	5d

[1]Nutrient removal provided as part of reclaimed water treatment process, sized for reclaimed water flows only.

[2]Added treatment for any constituents WestRock identifies.

[3]To allow direct potable reuse.

[4]Approximate minimum CTP flow that can be reliably sustained.

[5]Storage provided by WestRock and/or Tacoma so that 15 mgd flow rate is provided continuously.

[6]No storage provided by either WestRock or the City, flow would vary based on CTP plant flow during low CTP flow conditions.

The analyses to be performed will be to a level sufficient to develop order of magnitude screening level cost estimates (Phase 300) and to identify "fatal flaws" that would eliminate potential alternatives as infeasible.

Specific tasks will include:

1. Develop characteristic curves for daily CTP plant flow at low flow conditions and typical WestRock reclaimed water usage for the purposes of estimating storage requirements.
2. Perform preliminary hydraulic analysis of the transmission pipeline to determine nominal pipe sizes to be used in cost estimating.
3. Review available pipeline as-built drawings and inspection records for the existing transmission main along Portland Avenue and give direction to the City regarding sections of the pipeline that need to be inspected. The results of that inspection will be used to identify the condition of the pipe and the improvements that would be necessary before it could be put into service as a reclaimed water transmission line.
4. Perform a pipeline routing conflict review, using available City GIS data and Ecology Toxics Cleanup Program database. Results will be used to assess risks related to construction of a pipeline along the assumed conveyance pipeline route. A BCE will be prepared to evaluate the two pipeline options and select the option to be used in evaluating reclaimed water alternatives.
5. Develop an initial concept for pipeline sizing and routing to convey reclaimed water to two other potential customers at the Port of Tacoma and prepare a Class 5 cost estimate for each.
6. Develop process flowsheets and site plans for reclaimed water facility alternatives, including the number and capacity of unit processes and major equipment. Site plans will be initial layouts for discussion and to estimate total space required. More detailed layouts to confirm space availability would be developed as part of the WAC 173-290-180 Feasibility Analysis.
7. Construction cost estimates for this phase will be prepared as part of Phase 300.
8. Document the reclaimed water facility alternatives analysis and pipeline alternatives analysis in two separate TMs. BC will meet with the City to review the drafts and gather input prior to finalizing the memos.

Deliverables:

- Draft and Final Reclaimed Water Facility Alternatives TM presenting details for each of the reclaimed water alternatives including process flow sheet, summary design criteria to identify tank volumes and major equipment sizing, and conceptual site plans.
- Draft and Final Transmission Pipeline Alternatives TM presenting transmission pipeline alternatives, condition assessment of the existing pipeline, capital cost estimates for the construction of a new pipeline and improvements to existing pipeline to be used as inputs into the BCE to select preferred pipeline alternative.

Phase 300 – Cost Estimating

Capital costs to be incorporated into the BCE will be developed under this phase. Capital costs will be developed to American Association for Cost Estimating (AACE) Class 5 standards. This class of estimate is typically used for concept screening that are defined at a level between 0% and 2% of complete definition. This class of estimates typically have an expected accuracy range of 20% - 50% low to 30% - 100% high.

Deliverable:

- Cost estimating reports from BC estimating group
- Draft and Final Capital Cost Estimate TM summarizing the estimates and assumptions.

Phase 400 – BCE Development

The BCE evaluating the selected alternatives will be constructed under this phase. The alternatives developed in Phase 200 and priced in Phase 300 will be screened to select those alternatives considered most feasible. As many as eight screened alternatives will be evaluated as part of a business case evaluation.

The BCE will be loaded with capital costs, operating costs, and repair and replacement (R&R) costs along with placeholders for risk/benefit costs. Specific risks and benefits will be identified and values assigned in collaboration with the City. Where applicable, inputs used in previous BCEs that BC has prepared for the City will be used. For example, labor and power costs, risk costs for permit violations, etc.

Specific tasks will include:

1. Incorporate capital costs for each alternative, as developed in Phase 300 – Cost Estimating.
2. Develop operating costs for each alternative. Operating costs will include the following:
    a. City labor (operations and maintenance).
    b. Power and chemical requirements.
3. Include placeholders for revenue generated from the sale of reclaimed water. The BCE tool will be structured so that the revenue required for an alternative to become feasible can be calculated and used by the City as a basis of potential negotiations with WestRock.
4. Develop repair and replacement costs for each alternative. Replacement costs will include in-kind replacement of equipment over their projected service life.
5. Assess benefits of each alternative. One benefit will be reduced potable water usage by WestRock, making water available for sale to other Tacoma Water customers. Another benefit would be the delay in the need to construct additional outfall capacity. The value associated with more qualitative environmental and community benefits, for example the value to the community of developing a “green” reclaimed water utility, will be included as placeholders but will not be developed to the same level of detail as other BCE inputs. The placeholders will allow sensitivity analyses related to these benefits to be performed.

6. Assess risk costs for each alternative. Risk costs, based on likelihood of occurrence and the related consequence cost, may include the following:
    a. Risk of a sunk investment or loss of revenue if WestRock discontinues use of the reclaimed water due to the water not being suitable for their uses or because the economic benefits are not what they originally anticipated.
    b. Future changes to regulations and discharge limits impacting the use of reclaimed water by WestRock.
    c. Inability of the CTP effluent to meet Class B standards during peak flow periods when the ballasted sedimentation process is in service.
7. Prepare the draft BCE and submit to the City for review and comment. Alternatives will be compared to a "Do Nothing" alternative which would entail a project to increase the capacity of the outfall at some point in the future. The previously developed CTP outfall upgrade costs presented in the 2006 BC memo will be escalated based upon published Engineering News Record Construction Cost Index values.
8. Two formal meetings with the City will be conducted as part of this phase – one to review the draft BCE with the City to address initial comments and develop risk and benefit inputs and the other to review the draft memo.

Deliverable:

- Draft and Final BCE TM describing the development of the BCE and the selection of the preferred alternative.

Phase 500—Reporting

This phase will include the preparation of the Reclaimed Water Evaluation report summarizing the findings of the phases described above. The report will include the identification of issues that would need to be evaluated in a complete Feasibility Study per Ecology's Requirements. These issues would include: 1) permitting issues related to discharging CTP effluent to Puget Sound via the WestRock outfall, and 2) coordination with potable water suppliers.

The draft report will be submitted to the City following the completion of Phase 400. After receiving City review comments, the final report will be prepared and submitted.

Deliverable:

- Draft and Final Reclaimed Water Evaluation reports. The report will summarize the tech memos prepared under each phase above, and present recommendations for next steps.

Phase 600 – Project Management

This phase will provide project management, direction, coordination, and control of all work associated with project schedule, budget, technical quality, monthly progress reports, and invoices for this project. Quality assurance/quality control effort will be tracked as a separate task as part of Phase 600. Quality control reviews will include review of each deliverable by a BC subject matter expert prior to submittal of the draft deliverable to the City for review.

Deliverables

- Monthly progress reports and invoices.
- Monthly check-in meetings (10)
- Project Management Plan

Phase 700 – Contingency

The purpose of this phase is to provide an allowance for additional work that may be required beyond the scope described above. No contingency work will be performed without prior authorization by the City. Tasks that could be performed under this contingency phase could include:

- Additional layout of reclaimed water facilities on sites other than the location at the north end of the CTP site.
- Detailed layout and sizing of transmission lines to reclaimed water users other than WestRock.
- Development of design criteria, flow sheets, and layouts for facilities to cool the CTP effluent prior to transmission to WestRock.

Schedule

A preliminary schedule of key milestones is as follows. The budget assumes monthly check-in meetings with the City to discuss progress and address questions and bi-weekly internal staff meetings.

- Notice to Proceed: October 1, 2019
- Submit Draft Background and Planning Assumptions TM – December 15, 2019
- Submit Draft Alternatives Development TM – February 15, 2020
- Submit Draft BCE TM – March 30, 2020
- City Returns BCE TM Review Comments – April 30, 2020
- Submit Draft Reclaimed Water Evaluation Report – May 30, 2020

Assumptions and Limitations

An overall project duration of approximately 10 months is assumed. Meeting the schedule given above will require reviews to occur and comments to be compiled and returned to BC in the timeframes identified. If the review and associated comments are delayed in their return, the overall project schedule may be delayed as a result.

BC will rely on data provided by the City and WestRock and will not independently verify any of that data unless specifically noted in this scope of work.

Draft and final versions of all documents will be provided electronically unless specifically noted in this scope of work. One round of review for each draft deliverable is assumed with reconciled review comments being returned electronically in a comment tracking spreadsheet or a single pdf document.

Meetings with Tacoma and WestRock will typically include two BC staff and last no more than two hours. All meetings will be held in Tacoma.

The BCE is a tool to be used for planning purposes to evaluate alternatives and select a preferred alternative based on the current level of analysis. BCE results should be confirmed and updated as part of any preliminary design of potential improvements or further analysis by the City, BC, or any other third parties. The BCE developed as part of this scope of work will be prepared in a manner similar to others that BC has prepared for the City in terms of level of detail and the methodologies used.

Cost Estimates:

The scope of this evaluation is limited to a level sufficient to develop order of magnitude costs and to identify “fatal flaws” that would eliminate potential alternatives as infeasible. More detailed cost

estimates and analyses, including further alternatives development, will be completed in subsequent planning stages. The analyses performed will provide for direct comparison of alternatives.

Construction cost estimates are subject to many influences including, but not limited to, price of labor and materials, unknown or latent conditions of existing equipment or structures, and time or quality of performance by the contractor. These influences may not be precisely forecasted and are beyond the control of BC. Actual project costs may vary substantially from the estimates prepared by BC and BC does not warrant or guarantee the accuracy of construction or development cost estimates.

Exhibit B: Cost Estimate

Tacoma, City of (WA) -- CTP Reclaimed Water Evaluation

Phase	Phase Description	Morgan, Jeffrey R	Wolff, Hillary W	McBride, David J	DeBoer, Matthew J	Klein, Adam N	Stephens, Lynn M	Tam, Patricia S	Croucher, Lorena R	Goodburn, Daniel L	Linskens, Mary B	Vasquez, Jesus E	Total Labor Hours	Total Labor Effort	Company Vehicles	Total Expense Effort	Total Effort
		PM	PA														
		$260.00	$80.00	$252.00	$154.00	$212.00	$186.00	$212.00	$131.00	$212.00	$154.00	$111.00					
100	**Background and Planning**	24	6	36	56	20	24	16	0	32	6	0	**220**	**44,220**	0	**0**	**44,220**
101	City of Tacoma & Westrock Initial Planning Meetings	8	0	4	0	0	6	0	0	0	0	0	**18**	4,204	0	**0**	**4,204**
102	Review & Summarize City Effluent Data	0	0	0	12	0	0	0	0	0	0	0	**12**	1,848	0	**0**	**1,848**
103	Evaluate Impact of Peak Wet Weather Flow Facility	0	0	8	8	0	0	0	0	0	0	0	**16**	3,248	0	**0**	**3,248**
104	Summarize WestRock Reclaimed Water Needs	0	0	0	8	0	8	0	0	0	0	0	**16**	2,720	0	**0**	**2,720**
105	Summarize Reaclaimed Water Standards	0	0	0	0	0	8	0	0	0	0	0	**8**	1,488	0	**0**	**1,488**
106	Review & Summarize Previous Outfall Studies	0	0	4	8	4	0	0	0	0	0	0	**16**	3,088	0	**0**	**3,088**
107	Nutrient Removal Cost Estimate	8	0	0	0	8	0	8	0	16	0	0	**40**	8,864	0	**0**	**8,864**
108	Side Stream Treatment Cost Estimate	0	0	0	0	0	0	8	0	16	0	0	**24**	5,088	0	**0**	**5,088**
109	Develop Planning Assumptions	4	0	8	8	8	0	0	0	0	0	0	**28**	5,984	0	**0**	**5,984**
110	Draft & Final Planning Assumptions Tech Memo	4	6	12	12	0	2	0	0	0	6	0	**42**	7,688	0	**0**	**7,688**
200	**Alternatives Development**	16	12	64	64	44	44	52	164	0	12	0	**472**	**82,972**	0	**0**	**82,972**
201	Flow Characteristics & Storage Requirements	0	0	4	0	8	0	8	24	0	0	0	**44**	7,544	0	**0**	**7,544**
202	Transmission Pipeline Hydraulic Analysis	0	0	4	0	0	0	8	16	0	0	0	**28**	4,800	0	**0**	**4,800**
203	Evaluate Portland Avenue Transmission Main	4	0	16	0	0	0	0	12	0	0	0	**32**	6,644	0	**0**	**6,644**
204	Pipeline Routing Conflict Review and Transmission Main BCE	4	0	16	16	12	0	0	16	0	0	0	**64**	12,176	0	**0**	**12,176**
205	Pipeline Concepts for Potential Reclaimed Water Users	0	0	8	8	0	0	16	16	0	0	0	**48**	8,736	0	**0**	**8,736**
206	Reclaimed Water Alternative Process Flowsheets and Site Plans	0	0	0	0	16	40	16	80	0	0	0	**152**	24,704	0	**0**	**24,704**
207	Draft & Final Reclaimed Water Facility Alternatives Tech Memo	4	6	8	24	8	4	0	0	0	6	0	**60**	10,596	0	**0**	**10,596**
208	Draft & Final Transmission Pipeline Alternatives Tech Memo	4	6	8	16	0	0	4	0	0	6	0	**44**	7,772	0	**0**	**7,772**
300	**Cost Estimating**	4	2	16	8	0	0	0	0	80	6	0	**116**	**24,348**	0	**0**	**24,348**
301	Capital Cost Estimate	0	0	0	0	0	0	0	0	80	0	0	**80**	16,960	0	**0**	**16,960**
302	Draft & Final Capital Cost EstimateTech Memo	4	2	16	8	0	0	0	0	0	6	0	**36**	7,388	0	**0**	**7,388**
400	**BCE Development**	16	4	40	24	80	20	0	44	0	6	0	**234**	**45,624**	0	**0**	**45,624**
401	Capital Costs for Each Alternative from Phase 300	0	0	0	0	0	0	0	8	0	0	0	**8**	1,048	0	**0**	**1,048**
402	Develop O&M Cost Estimates	0	0	0	0	0	16	0	12	0	0	0	**28**	4,548	0	**0**	**4,548**
403	Revenue Generated Placeholder	0	0	0	0	0	0	0	4	0	0	0	**4**	524	0	**0**	**524**
404	Develop R&R Cost Estimates	0	0	12	0	0	0	0	20	0	0	0	**32**	5,644	0	**0**	**5,644**
405	Assess Benfit Costs	0	0	0	0	20	0	0	0	0	0	0	**20**	4,240	0	**0**	**4,240**
406	Assess Risk Costs	4	0	0	0	20	0	0	0	0	0	0	**24**	5,280	0	**0**	**5,280**
407	Prepare Draft BCE	4	0	8	0	24	0	0	0	0	0	0	**36**	8,144	0	**0**	**8,144**
408	Develp Do Nothing Alternative Cost	0	0	4	0	4	0	0	0	0	0	0	**8**	1,856	0	**0**	**1,856**
409	Draft & Final BCE Tech Memo	8	4	16	24	12	4	0	0	0	6	0	**74**	14,340	0	**0**	**14,340**
500	**Reporting**	6	12	12	40	16	10	0	0	0	12	0	**108**	**18,804**	0	**0**	**18,804**
501	Draft Report	4	8	8	32	12	8	0	0	0	8	0	**80**	13,888	0	**0**	**13,888**
502	Final Report	2	4	4	8	4	2	0	0	0	4	0	**28**	4,916	0	**0**	**4,916**
600	**Project Management**	48	38	32	0	24	24	0	48	0	0	24	**238**	**42,088**	500	**500**	**42,588**
601	Project Management & Work Plan	16	6	8	0	0	0	0	16	0	0	0	**46**	8,752	500	**500**	**9,252**
602	Invoice & Status Reporting	16	32	0	0	0	0	0	32	0	0	24	**104**	13,576	0	**0**	**13,576**
603	QA/QC	16	0	24	0	24	24	0	0	0	0	0	**88**	19,760	0	**0**	**19,760**
700	**Contingency**	24	0	24	24	24	40	0	64	0	0	0	**200**	**36,896**	0	**0**	**36,896**
701	Contingency	24	0	24	24	24	40	0	64	0	0	0	**200**	36,896	0	**0**	**36,896**
	GRAND TOTAL	**138**	**74**	**224**	**216**	**208**	**162**	**68**	**320**	**112**	**42**	**24**	**1,588**	**294,952**	**500**	**500**	**295,452**

Hours and Dollars are rounded to nearest whole number.