


TRANSMITTAL MEMORANDUM

7b

TO: The Honorable Mayor & City Council Initials: 

FROM: Shawn Hart, Acting Assistant City Manager File #: MGR25-278

DATE: April 25, 2025 Mtg. #: 05/01/25 NBb

RE: **Amendment No. 3 to Contract No. 23-32, Engineering Services Related to the City of Ketchikan Waste Water Treatment Plant Outfall Modeling Evaluation – Jacobs Engineering Group, Inc.**

The motion detailed below was prepared at the request of Public Works Director Seth Brakke, who asked that it be placed before the City Council for consideration at its meeting of May 1, 2025. If adopted, the motion provides for approving Amendment No. 3 to Contract No. 23-32 with Jacobs Engineering Group Inc. not to exceed \$209,500 to assist with determining the best disinfection alternative.

In adopting the 2025 General Government Budget, the City Council appropriated local funds in the amount of \$500,000 under the 2025 Wastewater Capital Improvement Plan for the Disinfection Requirements Project. These funds were designated to engage a consultant in evaluating and identifying the most effective disinfection solution to ensure the City achieves compliance with the NPDES permit within the required five-year timeframe. The proposed contract amendment exceeds \$50,000 and, in accordance with Ketchikan Municipal Code Section 3.12.035(c), requires City Council approval.

Public Works Director Brakke outlines the rationale for the proposed amendment in his attached transmittal memorandum. Given that the permit will necessitate a substantial project to incorporate disinfection into the treatment process, it is essential to engage professional engineering services to identify the most effective alternatives for meeting the proposed NPDES effluent limits for fecal coliform bacteria. As the City is already working with Jacobs Engineering Group on our ongoing wastewater project, their continued involvement is both practical and beneficial. I concur with the Director's recommendation to approve the amendment.

A motion has been prepared for City Council consideration.

Recommended Motion:

I move the City Council authorize Amendment No. 3 to Contract No. 23-32, Waste Water Treatment Plant Outfall Modeling Evaluation, between the City of Ketchikan and Jacobs Engineering Group, Inc., at a cost not to exceed \$209,500, bringing the total contract amount to \$432,300; and direct the Acting City Manager to execute the amendment on behalf of the City Council.

PUBLIC WORKS / ENGINEERING DEPARTMENT
Seth Brakke, P.E., Public Works Director & Engineering Manager
Kara Jurczak, P.E., Assistant Public Works Director
Amanda Robinson, AIA, Assistant Public Works Director
Phone: 907.228.4727



MEMORANDUM

TO: Lacey Simpson, Acting City Manager

FROM: Seth Brakke, PE, Public Works Director and Engineering Manager

CC: Jake Rodgers, Wastewater Supervisor

DATE: April 22, 2025

**SUBJECT: Wastewater National Pollutant Discharge Elimination System (NPDES)
Discharge Permit Renewal**

The City of Ketchikan's Wastewater Treatment Plant was permitted by the Environmental Protection Agency (EPA), constructed to produce effluent to meet the requirements of its NPDES Permit, and began improving water quality in Ketchikan in 1989. As was common at the time along the Pacific coast, the City qualified for and obtained a secondary treatment and disinfection waiver as provided for in the Federal Clean Water Act Section 301(H). Typically, NPDES permits expire every 5 years and must be renewed in advance of expiration. The City applied for an NPDES permit and 301(H) waiver renewal in the 2004/2005 timeframe. The EPA opted to administratively extend the permit and waiver which provided for the City to continue to operate in full compliance with the law under the terms and conditions of the old permit since that time.

In 2019 the EPA informed the City that they had assembled a permit writing team and that the EPA now intended to begin the work necessary to issue new permits to nine Alaska communities, including Ketchikan. On April 15th the EPA announced that the draft permit for Ketchikan is available for review and comments will be accepted through May 30, 2025. The draft permit is attached as Exhibit A. Our consultant Jacobs Engineering Group is already on board under the existing professional services agreement to provide assistance in reviewing and providing a list of comments as necessary to respond before the May 30th deadline.

It is immediately clear that the draft permit will require a significant project to add disinfection to the treatment process, and will have only 5 years to do so. As such a professional engineering services proposal has been obtained from Jacobs to assist the City with determining the best disinfection alternative to achieve the proposed NPDES effluent fecal coliform bacteria limits. Staff believes it is critical to the long-term success of this effort to keep Jacobs engaged through the NPDES draft permit response process. The Jacobs engineering

services proposal, in the amount of \$209,500, will take the project up to final disinfection facility plan. Funding is available from the 2025 Wastewater Capital Improvement Plan, Disinfection Requirements Project. Since this is above the \$50,000 threshold established in the KMC, it must be approved by City Council. A motion has been prepared for City Council consideration.

Recommended Motion:

I move the City Council approve Amendment No. 3 to Contract 23-32; authorizing additional funding in the amount of \$209,500 for engineering services for NPDES permit response to Jacobs Engineering Group Inc.; for a total contract amount of \$432,300; and authorizing staff to execute Amendment No. 3 on behalf of City Council.

Attachments:

2025 Draft NPDES Discharge permit

Jacobs Engineering Services Letter Proposal for Disinfection Facility Plan

Amendment #3 to Contract 23-32

2025 Wastewater Capital Improvement Plan, Disinfection Requirements project



REGION 10

SEATTLE, WA 98101

FAQ FOR SOUTHEAST ALASKA 301(H) FACILITIES

DECEMBER 2024

1. What is a 301(h) waiver?

- When cities discharge wastewater, they must treat it to a certain minimum level – at least secondary treatment - under the Clean Water Act (CWA).
- Under CWA Section 301(h), cities that discharge to oceans or saline estuaries were able to apply for a waiver from the minimum secondary treatment. The deadline to apply was Dec. 29, 1982.
- The 301(h) waiver means they don't need to treat their wastewater as much, because there can be a lot of mixing in oceans and estuaries.
- Cities were only granted a waiver if they met a set of factors in the regulations that make sure that the biological community isn't harmed by the wastewater discharge.

2. Does a 301(h)-permit exempt a facility from the requirements of the Clean Water Act?

- No. Section 301(h) only "waives" secondary treatment requirements. Secondary treatment requirements pertain only to total suspended solids (TSS), biological oxygen demand (BOD), and pH in wastewater. TSS is a measure of the solids in the discharge, BOD is a measure of the organic material, which can impact oxygen levels in the receiving water, and pH is a measure of the acidity or alkalinity of the discharge. Secondary treatment requires 85% removal of TSS and BOD in effluent and a pH from 6.0 to 9.0. The "waiver" relaxes the secondary treatment requirement to 30% removal of TSS and BOD in the effluent. The pH range can be below 6.0 and above 9.0 if state WQS can be met.
- A 301(h) "waiver" is NOT a waiver from ANY other pollutant.
- 301(h) facilities must still meet ALL applicable state WQS and CWA 304(a)(1) criteria for ALL parameters, including toxics, bacteria, and nutrients.

3. Why are 301(h) waivers allowed?

- Federal law provides for it in Section 301(h) of the Clean Water Act if facilities can prove they meet a set of criteria designed to ensure the discharge will be protective of human health and the environment and meet state WQS.

4. How common are 301(h) waivers?

- There are twenty-four (24) 301(h)-modified permits in the United States and territories, with 9 of them in Alaska.

5. How do you get a waiver? Is it becoming harder to keep a waiver? Have the number of waivers decreased? Why? Is there a policy to eliminate 301(h) waivers?

- Only facilities which applied for an original 301(h) waiver by Dec. 29, 1982, and met the statutory and regulatory criteria of CWA section 301(h) were eligible for a 301(h)-modified permit.
- There are no new 301(h) facilities. The number of waivers has declined from a high of ~45 to 24 today; 9 of the remaining 24 are in Alaska.
- There are several reasons for the steady decline in the number of 301(h) permits, including new state water quality requirements, facilities not complying with their permits, not meeting primary treatment, and some communities deciding to upgrade to secondary treatment technology.
- CWA section 301(h) is a statutory provision and there is no EPA policy to eliminate 301(h) waivers. If facilities and their receiving waters continue to meet the 301(h) criteria, they can continue to operate under a 301(h) waiver in perpetuity.

6. Why is EPA issuing these permits? What is the role of the State of Alaska?

- Only EPA can issue 301(h)-modified NPDES permits, so EPA is writing the permits for the 301(h) facilities in Alaska.
- When EPA writes permits, EPA must request certification under Section 401 of the CWA from the jurisdiction where the permit discharges. Since these permits discharge to Alaska waters, EPA will need to request 401 certification from the Alaska Department of Environmental Conservation (ADEC).
- ADEC's role is to review the permit to ensure it meets Alaska's WQS and state law, and to provide a 401 certification of the 301 modified permit. The 401 certification is the State's concurrence that the permit meets State law, including WQS. EPA cannot issue a 301(h) permit unless the State grants 401 certification or waives their right to certify.
- The 401 certification issued by ADEC can contain conditions to meet state water quality requirements including the authorization of mixing zones and schedules of compliance to meet new permit requirements.
- EPA has been working in close coordination with ADEC throughout the permit renewal process for each facility.

7. Why are new/more stringent bacteria limits required now?

- The 301(h) permits being renewed in SE Alaska are proposing more stringent bacteria limits for fecal coliform and new limits for enterococcus. Fecal coliform is an indicator of bacteria levels in shellfish that can make people sick. Enterococcus is an indicator of bacteria in water for gastrointestinal diseases that can also make people sick.
- The proposed limits are a condition of ADEC's 401 certification, or concurrence, of the renewed permits, and are necessary for the discharge to comply with Alaska water quality standards.
- The existing permits have bacteria limits for fecal coliform that are much higher than typical wastewater facilities.
- For fecal coliform, the new draft permit limits will require the SE facilities to treat their wastewater more to make sure their discharge meets Alaska's water quality standards and ensures the protection of human health and the environment.
- For enterococcus, ADEC established new water quality standards in 2017 that were not in effect the last time the SE permits were issued. The new reissued permits will include limits to ensure the discharge complies with these new water quality standards.

8. How long will facilities have to meet the new bacteria limits?

- None of the communities with 301(h) waivers currently provide consistent disinfection treatment to meet the proposed lower bacteria limits.
- The 301(h) facilities will need to upgrade the type of treatment they have at their facility to comply with the new bacteria limits. This will require investments to install or expand disinfection treatment in their plants (UV or chlorination).
- Since the facilities will need to upgrade, ADEC is providing them with a compliance schedule that will allow them more time to comply with the new bacteria limits.
- The compliance schedule is a condition of ADEC's 401 certification and requires communities to meet final effluent limits for bacteria in five years. It also contains interim steps the facilities must take to ensure consistent progress toward achieving the final limits.

9. What are the 301(h) criteria?

- The CWA has nine criteria and regulations that implement those nine criteria.
- In general, the criteria are designed to ensure the facility is well-operated and monitored, does not cause harm to the receiving water, human health, or biota, meets all State requirements and WQS, and is discharging to a healthy receiving water.

10. Why did EPA perform new dilution modeling of these discharges? Why did ADEC perform additional modeling?

- Dilution modeling was not conducted during the last permit development cycle for many communities.
- For other communities, dilution modeling occurred over 20 years ago.
- EPA and ADEC required new modeling to determine the dilution achieved after initial mixing.
- The modeling is necessary to determine how much pollution a facility can discharge from their wastewater and still be safe for the biological community after dilution in a certain area, which is called the zone of initial dilution (ZID).
- ADEC has its own set of mixing zone requirements. To conduct the mixing zone analysis under Alaska state law, ADEC needed to conduct additional modeling. ADEC determined that this supplemental modeling was needed to be consistent with how they establish mixing zones in permits that ADEC issues. The mixing zones are smaller than the ZIDs and ADEC has included these mixing zones as conditions of the 401 certifications.

11. How much will disinfection cost?

- The cost to upgrade the facility with disinfection technology depends on many factors.
- Communities will likely need to engage the services of professional engineering firms to assess disinfection options considering the size and flow of the facility, current levels of performance, and other factors.

12. What resources are available to assist communities with the financial burden of system upgrades?

- Several programs exist to assist communities with the financial burden of upgrading or expanding wastewater infrastructure (CWSRF and WIFFIA).
- EPA is also aware of some communities requesting and receiving congressionally directed funding (i.e., earmarks) for anticipated future wastewater requirements.

For additional information contact USEPA Region 10, NPDES Permitting Section at epar10wd-npdes@epa.gov.



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October 5, 2024

Seth Brakke, P.E., Public Works Director/Engineering Manager
City of Ketchikan
2930 Tongass Avenue
Ketchikan, AK 99901

SUBJECT: Engineering Services Letter Proposal to City of Ketchikan for Wastewater Treatment Plant Effluent Disinfection Facility Plan and Predesign for NPDES Permit Compliance

Dear Mr. Brakke:

Jacobs Engineering Group (Jacobs) appreciates this opportunity to submit our proposal for the City of Ketchikan's (City's) Charcoal Point Wastewater Treatment Plant (WWTP)'s Effluent Disinfection Facility Plan and Predesign. The draft NPDES permit, Permit Number AK0045675, is expected to be issued by USEPA this month. The final permit is expected to become effective in early 2025.

This letter proposal provides our scope of services and engineering fees to assist the City with determining the best disinfection alternative to achieve the expected NPDES effluent bacteria limits.

The key new discharge limits are based on published limits for other SE Alaska 301(h) waiver treatment plants for fecal coliform (FC) bacteria and enterococcus (E) bacteria. Your existing permit's FC daily limit is 1,500,000 count/100 mL. There is currently no limit E limit. The expected new FC daily limit is 800 count/100 mL which is 0.053% of the existing limit, and 7,280 count/100 mL E limit. The new permit is expected to have a total residual chlorine (TRC) limit of 0.05 mg/L.

The new NPDES permit is expected to include a 5-year compliance schedule with the schedule starting in early 2025. A Disinfection Facility Plan is to be completed by the end of 2025, Permit Year 1. Engineering design for the selected disinfection alternative must be completed by the end of 2026, Permit Year 2. The new facility must be constructed and operational by the end of 2029, Permit Year 5.

Develop the Disinfection Facility Plan

For a specific facility improvement, such as disinfection treatment, a facility plan is proposed to have the following steps:

- Step 1 - Establish WWTP bacteria and residual chlorine effluent discharge limits
- Step 2 – Assess existing facility's ability to meet the effluent limits from Step 1
- Step 3 – Assess existing and expected future facility flow rates and waste loads due to projected changes in the service area and number of customers
- Step 4 – Develop and evaluate disinfection alternatives to meet effluent limits and provide a means for the City to select the preferred alternative
- Step 5 – The City selects the preferred alternative from the Step 4 results and recommendations
- Step 6 – Develop a 10% level design for the preferred alternative
- Step 7 – Develop capital and O&M preliminary cost opinions to implement the preferred alternative
- Step 8 – Prepare a draft and final facility plan report

Our primary goal for the disinfection alternatives evaluation is to determine the most cost-effective means to achieve the new permit disinfection requirements. More specifically, we plan to determine the feasibility of achieving the required effluent disinfection within your existing primary clarifiers by applying a high initial disinfectant dose and allowing the required disinfection contact time to occur as the wastewater flows through the existing primary clarifiers. Bench-scale and full-scale testing are proposed to prove this approach will achieve the new bacteria effluent limits.

If feasibility of using the primary clarifiers is confirmed, the capital cost savings to the City will be significant. There will be capital costs for chemical storage, piping, pumps, and a flow paced disinfectant flow control system.

If feasibility of using your existing primary clarifiers is not confirmed, the most likely outcome will be a requirement to design and construct a chlorine contact basin (CCB) that will apply a disinfectant to the primary clarifier effluent to provide adequate contact time to complete the disinfection process before discharge to the WWTP's outfall system.

For all processes that use chlorine as the disinfectant, the final effluent will require dechlorination chemical addition to remove all free chlorine from the discharge to the WWTP's outfall to meet the expected new TRC permit limits.

Five disinfection alternatives will be evaluated for their feasibility to meet the new NPDES discharge requirements for effluent FC and E concentrations at the end of the outfall pipe. No bacteria mixing zone is expected to be allowed in the new NPDES permit.

The disinfection alternatives that are typically used in wastewater effluent and will be evaluated include:

- 1) UV Light - Feasibility for UV Light as the primary disinfectant is very low, especially since primary effluent typically has very low light transmittance capacity, and the City has not collected any primary effluent UVT data to date.
- 2) Peracetic Acid (PAA) – Feasibility is expected to be low due to high product cost. Bench scale testing should be able to confirm if the PAA dose will be low enough to make it worth additional study. We are not aware of any treatment facility in Alaska that uses PAA for effluent disinfection. PAA is used for Lower 48 effluent disinfection. A couple of PAA advantages are the product has a stable shelf life and does not require dechlorination.
- 3) On-Site Generated Sodium Hypochlorite – Many Alaska utilities, including KPU Water, generate their own chlorine with on-site generation systems for their disinfection needs. These systems only need to import high-quality salt to generate a low strength chlorine solution. They have moderate capital and O&M costs.
- 4) Commercial Grade Liquid Sodium Hypochlorite - 12.5% strength – Several Alaska utilities purchase and ship liquid commercial grade bleach to their treatment facilities for disinfection. Storage requirements are minimal, thereby greatly reducing capital cost requirements compared to costs for On-Site Generated Sodium Hypochlorite. High strength sodium hypochlorite decays over time in storage.
- 5) Calcium Hypochlorite in Solid Form (granular or tablet) at 65% to 85% strength. Calcium hypochlorite is the disinfectant of choice for most small and remote Alaska treatment plant disinfection requirements because shipping and storage costs are relatively low. Product cost is typically high compared to sodium hypochlorite. Also, calcium hypochlorite must be stored in waterproof containers to prevent a fire hazard that could occur if the stored product gets wet.

We propose to provide enough design and cost information to allow the City to select their preferred effluent disinfection method. After the City selects the preferred disinfection method, we will produce a 10% predesign and engineer's construction and O&M cost opinion and final Disinfection Facility Plan.

After the Final Facility Plan is delivered to the City, the City will be able to take actions needed to achieve effluent disinfection by the end of the NPDES permit 5-year compliance schedule. Those future actions include: 1) Complete facility final design; 2) Acquire construction funds, 3) Receive ADEC's Approval to Construct; 4) Advertise for public bids; 5) Open Bids; 6) Award the Construction Contract; 7) Complete construction and commission the new facilities; 8) Receive ADEC's Approval to Operate; 9) Begin effluent disinfection, and if needed dechlorination.

To deliver this WWTP Effluent Disinfection Facility Plan for the City, Jacobs proposes the following 6 tasks:

Task 1 – Project Kickoff and Site Visit

Two key Jacobs team members, our project manager and a senior WWTP disinfection engineer, will travel to Ketchikan for a kick-off meeting with City Public Works staff to review our scope of work and proposed deliverables. Following the meeting we will tour the WWTP to observe field conditions which will aid us when we evaluate disinfection alternatives, plan for full-scale disinfection testing, and to assess new facility disinfection facility locations.

Deliverables:

- Proposed Kick-Off agenda.
- Summary meeting notes and list of action items resulting from the kick-off meeting and any notes from our site visit.

Assumptions:

- Project kick-off session will be conducted at the earliest date possible following Notice-to-Proceed. We propose to meet at your Engineering and Public Works Conference Room, or any other preferred location, follow by a site visit.
- The City and Jacobs managers will determine who should attend the kick-off meeting from each entity.
- The results of the Disinfection Facility Plan, with our engineering recommendations, should provide enough information for the City to select the disinfection alternative that best meets the City's financial and non-financial goals.

Task 2 – Project Definition and Alternatives Evaluation

The project definition and alternatives evaluation task's purposes are to establish the project design criteria, testing protocol, and develop preliminary design details for each disinfectant that passes our initial screening. Work on this phase will culminate in the preparation of the Disinfection Facility Plan. The report will contain the information described in the subtasks below.

Subtask 2.1: Planning Criteria

Define the City's objectives and success factors for the project and document the City's planning and design criteria standards as they pertain to this work. Process mechanical and electrical redundancy requirements, and structural and architectural design requirements, will be included for all disinfection alternatives that pass the initial screening.

Jacobs will work with the City staff to define the peak flow projections for the project. The City will provide data and information to support the evaluation, including:

- Historical WWTP data reports, for at least the past 5 years, and projection of future plant flows and any expected changes in wastewater characteristics.
- Population projections for the City's service area.
- Any service area changes that could affect future plant flows.

For this study Jacobs plans to utilize the following design flows presented in the WWTP Design Criteria table on Sheet P1, Process Schematic, Hydraulic Profile, and Design Data, 1989 Primary WWTP design drawings by PEI Consulting Engineers:

- Maximum Month Flow: 4.7 mgd
- Peak Hour Flow: 8 mgd.
- Average wet weather flow: 4 mgd

All plant design flow data is based on an assumed population of 14,600. Note: The 2024 population = 8,049, down from a 2020 population = 8,192.)

Subtask 2.2: Alternatives Evaluation

Jacobs will perform an alternatives evaluation to compare monetary (upfront capital costs, ongoing operating & maintenance costs, and P-1 resulting calculated 20-year life cycle costs) as well as non-monetary factors identified by the City. The feasible disinfection alternatives for Ketchikan WWTP are expected to be:

- On-site generated (OSG) sodium hypochlorite for disinfection, delivered sodium bisulfite for dechlorination to achieve effective disinfection and dechlorination performance. A site within the WWTP property will have to be located for the new 2,500 to 3,000 sq ft building for the chlorination/dechlorination equipment.
- 12.5% commercial grade sodium hypochlorite, purchased in 275 to 300 gallons totes from a chemical supplier, shipped to Ketchikan, and stored at the WWTP site.
- 85% calcium hypochlorite that is purchased from a chemical supplier in water-proof buckets, shipped to Ketchikan, and stored at the WWTP site.
- Peracetic Acid (PAA) purchased in 275-to-300-gallon totes from a chemical supplier, shipped to Ketchikan, and stored at the WWTP site. NOTE: No secondary chemical is required to neutralize any PAA residual in the clarifier effluent.

Based on previous experience and evaluations it is assumed that UV light disinfection will not be feasible for the WWTP primary effluent due to the solids and constituents in the wastewater that will shield bacteria from the UV light, thereby making the required level of disinfection not reasonably achievable.

Dechlorination After disinfection with sodium hypochlorite or calcium hypochlorite, chlorine residual

can persist in the effluent for many hours. Alaska will not allow the use of chlorine alone for pristine receiving waters because of its effect on aquatic species. To minimize the effect, chlorinated wastewater must be dechlorinated. Dechlorination is the process of removing the free and combined chlorine residuals to reduce residual toxicity after chlorination and before discharge. Sulfur dioxide, sodium bisulfite, and sodium metabisulfite, and ascorbic acid are the commonly used dechlorinating chemicals.

The feasible dechlorination alternative for Ketchikan WWTP is expected to be:

- Delivered sodium bisulfite for dechlorination. A sodium bisulphite dechlorination system typically includes a flow paced chemical feed system with chemical storage within or near the WWTP.

Jacobs will prepare initial design calculations and develop conceptual drawings (5 percent design) of the alternatives identified based on the design criteria established through the previous subtasks. Order-of-magnitude Class 5 cost estimates will provide construction cost information for comparative purposes between the alternatives. Annual operating costs and life cycle costs will also be developed for these alternatives.

Any cost opinions or project economic evaluations provided by Jacobs will be on a basis of experience and judgment, but, since we have no control over market conditions or bidding procedures, we cannot warrant that bids, ultimate construction cost, or project economics will not vary from these opinions.

Jacobs will conduct a non-monetary evaluation in collaboration with City staff. Non-monetary evaluation criteria, which will be identified during Task 1 and refined/finalized in Task 2, may include items such as operability, operator safety, maintainability, flexibility, reliability (including reliance on material/chemical deliveries), public acceptance of one technology over another, and other factors.

Jacobs will document a summary of the results of this evaluation in a tech memo.

Deliverables:

- Project Definition and Alternatives Evaluation Disinfection Facility Plan.

Assumptions:

- It is assumed there is no difference in the disinfection characteristics for sodium hypochlorite and calcium hypochlorite.

Task 3– Bench and Full-Scale Disinfection Testing

Bench-scale pilot testing will be used to further evaluate the alternatives.

- 1) Calcium Hypochlorite
- 2) PAA

Full Scale Testing will use the results of the bench-scale testing to set the disinfection testing dosages for establish the effectiveness of disinfection within the primary clarifiers.

Assumptions:

- Bench-scale testing will be provided by the City's laboratory with test procedure guidance provided by Jacobs. The primary testing will be to determine the disinfectant dose and contact time requirement to achieve fecal coliform reductions to the expected permit requirements. Over the course of the bench-scale test period we expected at least 100 fecal coliform tests for each disinfectant tested. Our plan is to have the City lab test a disinfectant solution from calcium

hypochlorite and PAA.

- City lab fecal coliform lab test results will be provided to Jacobs within 72 hours of the fecal coliform tests being completed for bench scale testing and within 24 hours of fecal coliform tests being completed for the short-duration full-scale disinfection tests conducted on a single clarifier. This test result turnaround time is important for us to meet our proposed project schedule.
- All products required for both bench scale and full-scale testing will be provided by the City.
- The full-scale testing will be conducted over multiple seasons and flow rates to help establish the feasibility to achieve reliable discharge permit compliance.
- City staff will assist Jacobs staff when full scale plant disinfection testing is conducted. The plan is to supply a set dose of disinfectant into one section of the flow splitter box to allow full-scale disinfection testing in a single clarifier. The plant flow meter will be used to determine the flow rate in a single clarifier. We will work with plant staff to mix a concentration of dissolved calcium hypochlorite as the source of chlorine for the full-scale disinfection testing. The pumped chlorine solution flow rate will be adjusted every 15 minutes, based on the plant influent flow rate. Each full-scale test is expected to be conducted over a minimum of 6 hours to achieve steady disinfection conditions within the clarifier. After the disinfection test is completed, if plant flows are below 3 mgd, we may request the plant operators take a clarifier off-line on day 2 to simulate a high flow rate for the second full-scale disinfection test. On day three we plan to conduct a full-scale test at a higher chlorine dose. All fecal coliform sampling and testing will be conducted by the treatment plant lab manager.

Task 4– Disinfection Testing Summary and Recommendations

Task 4 will summarize all disinfectant test results, assess expected annual chemical costs for each disinfectant and, if required, dechlorination chemical costs. A cost comparison table and a table of advantages and disadvantages of each disinfectant tested will be provided. The resulting Technical Memorandum will also include appropriate engineering recommendation.

Task 5– Prepare Disinfection Facility Plan

Jacobs will prepare a draft Disinfection Facility Plan detailing the analysis and findings of the alternatives evaluation and disinfection testing. A presentation of the results will be made to the City by conference call approximately 2 weeks after draft report submittal. Based on this information we are expecting City staff will select an alternative that will then be documented in the final Disinfection Facility Plan.

Deliverables:

- Draft Disinfection Facility Plan will document the analysis conducted and provide a preliminary recommendation to the City. Document will be provided electronically.
- Final Disinfection Facility Plan will document the analysis conducted and provide the selected disinfection alternative selected by the City. The final report will be provided electronically.

Assumptions:

- Conceptual drawings (e.g. site layout, section/detail) will be developed for each of the disinfection alternatives to capture the intent of the concept and serve as the basis for the Class 5 construction cost estimate.

The Class 5 construction cost estimate (+100%, -50%) will be included in the report as a total estimated

value for each concept. A detailed breakdown of the costs will not be provided. The construction cost estimates will be used solely for comparative purposes between the alternatives. The cost opinions provided will be prepared for guidance in project evaluation from the information available at the time of preparation. The final project construction costs will depend on actual labor and material costs, actual site conditions, productivity, competitive market conditions at the time of project bid, final project scope, final schedule and other variable factors. As a result, the final project costs will vary from the engineer's preliminary construction cost opinion. Because of these factors, funding needs must be carefully reviewed by the City prior to making specific financial decisions or establishing final budgets.

- A draft copy of report will be developed and provided to the City as an electronic deliverable (PDF) 2 weeks in advance of the conference call. The report will then be finalized to capture the discussions and decisions made during the conference. The final report will be delivered electronically to the City.

Task 6- Project Management

I will be your primary point of contact for the project. I will lead our engineering team, manage schedule and budget, review monthly invoices, and provide the City with project progress reports. I will lead project progress calls with you and be available as needed. Our project accountant will prepare draft invoices for my review and approval.

Disinfection Feasibility Project Team

I will be assisted by Parke Ruesch who has extensive experience conducting alternative wastewater disinfection studies. Christi Meyn will serve as the process engineer.

Additional design discipline support identified below will be utilized as necessary to execute the work, to conduct the evaluation and develop the Predesign Report.

Core Study Team:

Project Manager – Floyd Damron, PE

Senior Process Engineers – Parke Ruesch, P.E. and Bill Leaf, P.E.

Process Field Engineer – Christi Meyn, PE

Senior Disinfection Advisor - Matt Noesen, PE

Design Support, As Needed:

CAD – Rory Benfield

Cost Estimating – Nick Cavalleri

Other engineers and technicians will be utilized, as needed, to complete future design and construction tasks executed in subsequent phases.

Disinfection Facility Plan Schedule

The draft report will be delivered to the City within 300 days after the Notice to Proceed (NTP) is issued to Jacobs. The City will have two weeks to review and comment and Jacobs will have 3 weeks after receipt of City comments on the draft report to deliver the final report, with the final report being complete no later than 365 days after NTP.



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Future Design and Services During Construction

We will be prepared to proceed with final design and construction phase engineering services when the City is ready to proceed with the next steps toward NPDES permit compliance.

Disinfection Facility Plan Engineering Lump Sum Fee Proposal

Jacobs proposes to perform the Disinfection Facility Plan for a Lump Sum Fee Amount of \$209,500 as follows:

Task 1 – Kick-off and Site Visit	\$17,000
Task 2 - Disinfection Alternatives Evaluation	\$28,500
Task 3 - Bench and Full-Scale Testing	\$83,000
Task 4 – Testing Summary and Recommendations	\$16,000
Task 5 - Draft and Final Disinfection Facility Plan	\$40,000
Task 6 - Project Management	\$25,000

TOTAL LUMP SUM FEE AMOUNT = \$209,500

We look forward to assisting the City with their wastewater treatment needs and to continue providing critically important engineering services. We are ready to immediately begin work on the WWTP disinfection project. We recommend the new project be added to our existing contract to facilitate the most efficient way to move the project forward.

Please let me know what questions you may have regarding our proposal.

Sincerely,

Jacobs Engineering Group Inc.

Floyd J. Damron, P.E.
VP & Alaska Manager

Michael Reimbold, P.E.
Manager of Projects

AMENDMENT NO. 3
To
AGREEMENT
ENGINEERING SERVICES RELATED TO THE CITY OF KETCHIKAN
WASTE WATER TREATMENT PLANT OUTFALL MODELING EVALUATION
JACOBS ENGINEERING GROUP INC. 23-32

THIS AMENDMENT made and entered into this _____ day of _____, 2025, by and between the City of Ketchikan, Alaska, a municipal corporation, 334 Front Street, Ketchikan, Alaska 99901, hereinafter called “OWNER”, and Jacobs Engineering Group Inc. whose address is 1999 Bryan Street Suite 1200 Dallas, TX 75201, and licensed and qualified to do business within the state of Alaska, hereinafter called “CONTRACTOR”.

WHEREAS, the **OWNER** and **CONTRACTOR** entered into the Agreement for Engineering Services for consulting services related to the City of Ketchikan Waste Water Treatment Plant Outfall Modeling Evaluation, dated **August 08, 2023**, and now mutually desire to amend said contract.

NOW, THEREFORE, for good and valuable consideration, the Agreement for Engineering Services, dated **August 08, 2023**, Engineering Services the City of Ketchikan Waste Water Treatment Plant Outfall Modeling Evaluation, is hereby amended as follows:

1. Exhibit A, Amendment No. 3, Scope of Services, attached and adds the following Tasks:
 - Task 3-1 – Disinfection Project Kickoff and Site Visit
 - Task 3-2 – Project Definition and Alternatives Evaluation
 - Task 3-3 – Bench and Full Scale Disinfection Testing
 - Task 3-4 – Disinfection Testing Summary and Recommendations
 - Task 3-5 – Prepare Disinfection Facility Plan
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2. Exhibit A, Amendment No. 3, Fee Proposal, is attached to include compensation for noted Tasks by **\$209,500**
3. Section 31, Maximum Amount of Contract, is amended to read as follows:

Section 31: Maximum Amount of Contract. **Contractor** acknowledges and agrees **Owner's** funding is of a limited nature and source and **Owner** shall in no event be liable for payment of any amounts under this Agreement, or otherwise, in excess of the total amount of Four Hundred Thirty Two Thousand Three Hundred Dollars (\$432,300), and at such times as the total amount paid or due, or claimed by **Contractor**, reaches a total of Four Hundred Thirty Two Thousand Three Hundred Dollars (\$432,300), Contractor shall forthwith notify **Owner** thereof. It shall be the **Contractor's** obligation to notify **Owner** and to assure no work in excess of said total sum of Four Hundred Thirty Two Thousand Three Hundred Dollars (\$432,300) is done and any work

done in excess thereof shall not entitle **Contractor** to any payment and **Contractor** expressly waives any claim therefor, unless such additional work was separately authorized in writing as a written change order or amendment to this Agreement prior to commencement and performance of any such additional work.

4. Except as provided in this Amendment, the Agreement for ENGINEERING SERVICES RELATED TO THE CITY OF KETCHIKAN WASTE WATER TREATMENT PLANT OUTFALL MODELING EVALUATION, dated **August 08, 2023**, is hereby ratified and affirmed and remains in full force and effect without any other amendment.

5.

OWNER:
CITY OF KETCHIKAN, ALASKA

By: _____
Lacey Simpson
Acting City Manager

ATTEST:

Kim Stanker
City Clerk

CONTRACTOR:
Jacobs Engineering Group, Inc.

(type in name)

(signature of authorized officer)

(title of person signing)

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Department: Public Works, Wastewater					Priority Number: 4				
Project Title: Disinfection Requirements					Start Date: 01/25				
					End Date: 12/29				
Description:									
The Alaska Department of Environmental Conservation will be issuing a permit to the City of Ketchikan in the Winter/Spring of 2024 dealing more restrictive requirements for disinfection of the City's wastewater. This permit is anticipated to have yearly milestones for a 5 year timeline in order to comply with the permit. The eventual outcome will be to construct a new facility to house the new disinfection equipment and processes. In order to meet these milestones, a consultant will be required to help determine the City's best options for disinfection.									

Project Cost Category	Prior Years	Adopted 2025			Projected Requirements				Total Project
		Reappro- riated	New Funding	Total	2026	2027	2028	2029	
Public Art		250,000	250,000	500,000	500,000				1,000,000
Design									
Land/Property Acquisition (ROW)									
Land/Property Improvements									
Construction Management									
Construction						14,000,000			14,000,000
Vehicles/Moving Equipment									
Operating Equipment									
Environmental/Other Studies									
Other - Permit									
Total		250,000	250,000	500,000	500,000	14,000,000			15,000,000

Source of Funds	Fund No.	Prior Years	Adopted 2025			Projected Requirements				Total Project
			Reappro- riated	New Funding	Total	2026	2027	2028	2029	
Wastewater Services Fund	505		250,000	250,000	500,000	500,000	14,000,000			15,000,000
Total			250,000	250,000	500,000	500,000	14,000,000			15,000,000