



INTERLOCAL COOPERATION CONTRACT NO. 26-001-AMS
BETWEEN THE
EDWARDS AQUIFER AUTHORITY
AND
THE UNIVERSITY OF TEXAS AT SAN ANTONIO FOR
A METAGENOMIC APPROACH TO MONITORING WATER WITHIN THE
CONTRIBUTING ZONE OF THE EDWARDS AQUIFER

This INTERLOCAL COOPERATION CONTRACT (Contract) is made and entered into under the Texas Interlocal Cooperation Act (ICA), Chapter 791, Texas Government Code, by and between the EDWARDS AQUIFER AUTHORITY (EAA), a political subdivision of the State of Texas, with its principal place of business located at 900 E. Quincy Street, San Antonio, Texas 78215, and THE UNIVERSITY OF TEXAS AT SAN ANTONIO (Participant), an agency of the State of Texas and an institution of higher learning in the University of Texas System, with its principal place of business located at One UTSA Circle, San Antonio, Texas, 78249. Each of these entities is, at times, referred to in this Contract individually as a “Party,” and both are referred to collectively as “Parties.”

RECITALS

WHEREAS, the EAA was created by the Edwards Aquifer Authority Act, Act of May 30, 1993, 73rd Leg., R.S., ch. 626, 1993 Tex. Gen. Laws 2350, as amended (Act); and

WHEREAS, under Section 1.02 of the Act, the EAA is a conservation and reclamation district created by virtue of Article XVI, Section 59, Texas Constitution, and a governmental agency and body politic and corporate vested with the full authority to exercise the powers and to perform the functions specified in the Act, and other applicable law; and

WHEREAS, under Section 1.08(a) of the Act, the EAA has all the powers, rights and privileges necessary to manage, conserve, preserve, and protect the Edwards Aquifer (Aquifer) and to increase the recharge of, and prevent the waste or pollution of water in, the Aquifer; and

WHEREAS, under Section 1.27 of the Act, the EAA may conduct research; and

WHEREAS, under Section 1.11(d)(2) of the Act, and other applicable law, the EAA may enter into contracts; and

WHEREAS, this Contract is an interlocal contract entered into under the authority of the ICA, Chapter 791, Texas Government Code; and

WHEREAS, under Section 791.003(4)(A) and (5) of the ICA, the EAA is a local government; and

WHEREAS, under Section 771.002(a)(B) of the Texas Government Code, Participant is an “agency” of the State of Texas; and

WHEREAS, under Section 791.011 of the ICA, a local government may contract with a state agency, as that term is defined in 771.002 of the Texas Government Code; and

WHEREAS, under Section 791.011(g), a state agency “that makes purchases or provides purchasing services under an interlocal contract for a state agency, as that term is defined under Section 711.002, must comply with Chapter 2161 [relating to historically underutilized businesses] in making the purchase or providing the services”; and

WHEREAS, under Section 791.003(3) of the ICA, the activities that are the subject of this Contract are governmental functions and services in that they involve the public health and welfare, planning, administrative functions, and/or other governmental functions in which the Parties are mutually interested; and

WHEREAS, Participant has been authorized by its governing body to enter into this Contract; and

WHEREAS, the EAA’s Board of Directors has approved this Contract, and authorized the EAA General Manager to execute the Contract; and

WHEREAS, the purpose of this Contract is to perform multi-molecular marker and metagenomic analyses in surface water sites within the contributing zone of the Edwards Aquifer; and

WHEREAS, it is in the public interest that the EAA enter into this Contract.

AGREEMENT

NOW THEREFORE, for and in consideration of the mutual promises and agreements set forth in this Contract, the EAA and Participant agree as follows:

ARTICLE I – TERM; DESCRIPTION OF WORK

Section 1.1. Term. This Contract is effective and commences on the date that it has been executed by both parties (Effective Date) and terminates on December 31, 2027 (Expiration Date). The annual project funding will be made available to Participant at the beginning of each project year if the proposed project tasks for the preceding year are successfully completed.

Section 1.2. Services. Subject to the terms and conditions of this Contract, the EAA engages Participant to perform, for the benefit of the EAA, the work set forth and described in this Contract and in the following documents (Services), which are attached hereto: (1) the Scope of Work, which is attached hereto as Exhibit A; and (2) the Budget Estimate, which is attached hereto as Exhibit B. Participant accepts such engagement and agrees to devote its best efforts and abilities and furnish all necessary labor, machinery, equipment, tools, and transportation necessary in furtherance thereof.

Section 1.3. Commencement and Completion of Services. Participant will commence performing the Services consistent with the Effective Date in Section 1.1. All Services will be completed and delivered to the EAA by the Expiration Date and shall be completed in compliance with the schedules, budgets, descriptions, and specifications contained herein and, in the Exhibits, attached hereto. It shall be Participant's responsibility to ensure that the completion times for the tasks required under this Contract are met in accordance with the Scope of Work.

ARTICLE II – AMENDMENTS

Section 2.1. Amendments. This Contract, including Exhibits, may be amended only by written agreement of the Parties.

Section 2.2. Amendments by the General Manager. The Board of Directors of the EAA delegates the authority to the General Manager to enter into amendments to this Contract without further authorization by the Board, consistent with the General Manager's authority to enter into contracts under Section 5.01 of the EAA's Bylaws.

ARTICLE III – COMPENSATION

Section 3.1. Fees and Expenses. The EAA agrees to pay Participant for the Services rendered in accordance with the Scope of Work and Budget Estimate, but in no event shall payments to the Participant exceed \$232,943. Participant may not exceed this amount and will be responsible for the payment of all of its other additional costs and expenses. Participant is not authorized to expend any additional funds in excess of this amount without the prior written approval from the EAA. The EAA will not be held accountable for any unauthorized work performed or funds expended by Participant in providing the Services.

Section 3.2. Payment. All “invoice packets” from Participant to the EAA for the Services for each previous month’s activities shall be sent no later than the 30th day of each month, beginning April 30, 2026, and shall provide an itemization of the Services rendered, and any costs and expenses incurred during the billing cycle. As applicable, documentation in the invoice packet must be sufficiently itemized and provide detail for all purchases and expenses to allow the EAA to clearly discern purchases made. Alcohol purchases will NOT be reimbursed under any circumstances. Mileage will be reimbursed at the current IRS-approved rate, if submitted. In no event will the EAA pay per diem-related expenses; expenses will be paid at cost with appropriate documentation. The monthly invoice packet will be submitted electronically in Adobe Acrobat (pdf) format via email to the Sr. Director of Aquifer Science at pbertetti@edwardsaquifer.org and accounting@edwardsaquifer.org. If Participant utilizes subcontractors (see Article V), Participant shall submit a Subcontractor Utilization Report with each invoice submitted to the EAA for payment. The terms of each invoice shall be net thirty (30) days upon EAA receipt and approval of that invoice.

ARTICLE IV – INDEPENDENT CONTRACTOR

Section 4.1. No Employment Relationship. The Parties understand and agree that this Contract does not create a fiduciary relationship between them, that they are separate entities, that Participant is an independent party with respect to the performance of the Services and is not subject to the direct or continuous control and supervision of the EAA, and that nothing in this Contract is intended to make either Party a subsidiary, joint venturer, partner, employee, agent, servant or representative of the other Party for any purpose whatsoever. Participant shall provide any and all equipment and materials necessary for the performance of the Services. The EAA shall have no right of direction or control of Participant, or its employees and agents, except in the results to be obtained, and in a general right to order the performance of the Services to start or stop as agreed to herein, to inspect the progress of the Services, and to receive reports. Participant shall accommodate reasonable requests from the EAA to allow EAA employees, agents or representatives to accompany and observe Participant personnel in carrying out the Services under this Contract.

ARTICLE V – PARTICIPANT PERSONNEL AND SUBCONTRACTORS

Section 5.1. Personnel. Participant will provide any and all personnel necessary for its performance of the Services. Participant will be responsible for its employees and agents in all respects, including, without limitation, their compliance with applicable laws and their safety, including without limitation, all Occupational Safety and Health Administration (OSHA) standards, requirements, and regulations. To the extent authorized by law, each Party indemnifies and holds harmless the other Party, its officers, employees, and directors, from and against any claims brought by any employee, subcontractor, or other agent of the indemnifying Party relating in any way to the obligations and Services performed under this Contract.

Section 5.2. Subcontractors. In performing the Services under this Contract, Participant may retain and utilize as its subcontractors, to the extent that they are not already employees of Participant, those individuals identified to and approved in writing by the EAA, in advance. The EAA, in consultation with Participant, shall have the right to terminate, limit, or alter, at any time,

the participation of any subcontractor utilized by Participant. No additional subcontractors may be retained by Participant to perform any Services under this Contract without the prior written consent of the EAA, provided that no such consent shall be necessary for the retention of any subcontractor previously approved by the EAA and identified by Participant on the Effective Date of this Contract. Participant will be responsible for its subcontractors in all respects, including their compliance with applicable laws and their safety, including without limitation, all OSHA standards, requirements, and regulations.

ARTICLE VI – TERMINATION

Section 6.1. Termination for Convenience. Either Party may terminate this Contract at any time, including at the expiration of each budget or payment period during the term of this Contract, with or without cause, upon thirty (30) days' prior written notice to Participant.

Section 6.2. Termination for Cause. If either Party has been deficient in performing its obligations under the Contract, written notice will be given by the other Party stating the nature of the deficiency and advising that failure to correct the deficiency may result in termination of the Contract. Such other Party will respond in writing within thirty (30) days, describing the action to be taken or the plan designed to correct such deficiency. If the response is not satisfactory to the notifying Party, the Contract may then be promptly terminated by such Party by notice of termination.

Section 6.3. Actions in the Event of Early Termination. Upon receipt of a notice of termination under this Article, Participant shall immediately stop all work in progress, including all work performed by its employees, agents, or subcontractors. Insofar as possible, all work in progress will be brought to a logical termination point. Within thirty (30) days of the final invoice following termination, the EAA shall pay Participant all moneys then due and owing for the Services rendered, and costs and expenses reasonably incurred up to the time of termination, including committed, uncancelable, costs incurred prior to termination. Participant will deliver to the EAA copies of all finished and unfinished documents, data, studies, surveys, drawings, maps, reports, photographs, and other materials prepared by Participant, and each Party shall be free to utilize such documents, data, studies, surveys, drawings, maps, reports, photographs, and other materials as it sees fit.

ARTICLE VII – OWNERSHIP OF MATERIALS

Section 7.1. Deliverables, Background Intellectual Property, and Project Intellectual Property; Ownership. All information, documents, property, or materials produced, or created jointly under this Contract by the EAA and Participant, its employees, agents or subcontractors or anyone else, and whether finished or unfinished or in draft or final form, will be the jointly-owned property of the EAA and Participant. All information, documents, property, or materials produced, created solely by either Participant or the EAA under this Contract will be the owned property of the respective Party unless expressed otherwise in writing. Each Party shall have unlimited rights to technical and other data resulting directly from the performance of Participant's Services under this Contract for research, scholarly, academic, and non-commercial purposes.

“Background Intellectual Property.” It is possible that one or both Parties may possess rights in “Background Intellectual Property,” that is, intellectual property not otherwise subject to this Contract, which would be useful or essential to the practice or commercialization of the results of this Contract. For example, Participant might own a patent which would be infringed by the EAA when it attempted to commercialize the results of this Contract unless a license was obtained from Participant. Where the Parties determine that background technology may exist, consideration should be given to negotiating a separate intellectual property license agreement for license rights that will allow the practice and commercialization of the results of this Contract.

“Project Intellectual Property” means the legal rights relating to inventions, patent applications, patents, copyrights, trademarks, mask works, trade secrets, and any other legally protectable information, including without limitation computer software, first made or generated during the performance of this Contract.

The rights of the Parties to Project Intellectual Property made by their employees in performing work under this Contract shall be as set forth herein:

- a. The EAA exclusively owns title to any Project Intellectual Property made or conceived solely by EAA employees in the performance of this Contract. For avoidance of doubt, ownership of any Participant confidential information contained in the EAA’s owned research intellectual property is retained by Participant.
- b. Participant exclusively owns title to any Project Intellectual Property made or conceived solely by Participant employees in the performance of this Contract. For avoidance of doubt, ownership of any EAA confidential information contained in Participant’s owned research intellectual property is retained by the EAA.
- c. The EAA and Participant shall jointly own title to any Project Intellectual Property that is made or conceived by one or more employees of the EAA and one or more employees of Participant in the performance of this Contract.

Section 7.2. Delivery of Documents upon Termination. Upon termination of this Contract under Sections 1.3 or 6.1, all deliverables set out in Scope of Work, whether complete or incomplete, that may take the form of such information, documents, property, or materials that are not already in the possession of the EAA will be delivered by Participant to the EAA within thirty (30) days of termination.

Section 7.3. Nondisclosure of Documents. Both Parties recognize that each Party is subject to the provisions of Chapter 552, Texas Government Code. If a request for public information is filed with one of the Parties under Chapter 552, any information, property, or materials produced, created, or supplied under this Contract that is subject to disclosure under Chapter 552 may be disclosed by the Party to any third party without the prior written consent of the other Party. If such a request is filed, the Party receiving the request shall promptly give notice to the other Party of the request and provide a schedule of the documents provided.

Section 7.4. Record Copies. Participant shall retain a record copy of all information, documents, property, or materials developed in the course of performing the Services for a minimum of three (3) years. Upon request of the EAA, such information, documents, property, or materials will be promptly supplied to the EAA, including after the Expiration Date or the termination of this Contract under Section 6.1. The EAA will reimburse Participant for the actual cost of time and expenses of reproduction of such materials if requested.

Section 7.5 Publications. For publications of documents prepared under this Contract, the publishing Party shall provide the other Party a thirty-day (30) period in which to review the proposed publications, identify proprietary or confidential information, and submit comments. The publishing Party will give full consideration to all comments before publication. All publications created by Participant pertaining to this Contract shall acknowledge that research performed by Participant was funded by the EAA.

ARTICLE VIII – PERFORMANCE

Section 8.1. Performance of Services. Participant agrees that it will perform all Services in a good and workmanlike manner, strictly in accordance with the standards of Participant’s profession, the Scope of Work, and as otherwise provided in this Contract and the Exhibits attached hereto. To the extent permitted by law, Participant’s failure to timely perform the Services as agreed shall constitute a breach of this Contract and shall be subject to all applicable remedies at law or equity. Judgment of nonperformance shall rest solely with the EAA.

ARTICLE IX – LIQUIDATED DAMAGES

THIS ARTICLE INTENTIONALLY LEFT BLANK

ARTICLE X – BOND COVERAGE

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ARTICLE XI – INSURANCE

Section 11.1. Insurance Coverages. The EAA acknowledges that, because Participant is an agency of the State of Texas, liability for the tortious conduct of the agents and employees of Participant is governed by Chapters 101 and 104, Texas Civil Practice and Remedies Code and Chapter 2259, Texas Government Code, and that Workers’ Compensation Insurance coverage for employees of Participant is provided by Participant as mandated by the provisions of Chapter 503, Texas Labor Code. The liability of Participant and its members for personal injury and property damage is governed by the Texas Tort Claims Act, Texas Civil Practice and Remedies Code, Chapter 101, Section 101.021. The limits of liability are \$250,000 for each person, \$500,000 for each single occurrence for bodily injury or death and \$100,000 for each single occurrence for injury to or destruction of property.

Section 11.2. No limitations. Participant's obligation to obtain and maintain the foregoing policy or policies in the amounts specified shall not be limited in any way by reason of any insurance that may be maintained by the EAA, nor shall Participant's performance of this obligation relieve it of liability under the indemnity provisions set forth in Section 12.2.

ARTICLE XII – ASSUMPTION OF RISK AND INDEMNIFICATION

Section 12.1. Risk. To the extent authorized by law, each Party shall assume all risks associated with its or its subcontractors' performance under this Contract and shall waive any claim against the other Party for damages arising out of the performance of the Services under this Contract.

Section 12.2. Indemnification. To the extent authorized by law, each Party shall defend, indemnify, and hold harmless the other Party, its directors, officers, employees, and agents from any and all damages, loss, or liability arising from (a) other contracts or arrangements between the indemnifying Party and any third parties that are entered into to perform the Services of this Contract, (b) any claims brought by any person relating to this Contract or the Services, or (c) the quality or the performance of the Services. The foregoing indemnification is limited to the extent that such liability, loss, or damage was caused by the negligent act, error, or omission of the indemnifying Party or any person or entity for whom the indemnifying Party is legally liable.

Section 12.3. Sovereign Immunity. Nothing herein shall constitute a waiver of either Party's right to assert sovereign immunity.

ARTICLE XIII – NOTICES

Section 13.1. Notices to the EAA. All notices or communications under this Contract to be mailed or delivered to the EAA shall be in writing and shall be sent to the EAA's principal place of business as follows, unless and until Participant is otherwise notified:

EDWARDS AQUIFER AUTHORITY
Attention: Shelly Hendrix, Sr. Director of Finance/CFO
900 E. Quincy Street
San Antonio, Texas 78215
contracting@edwardsaquifer.org

Section 13.2. Notices to Participant. All notices or communications under this Contract to be mailed or delivered to Participant shall be in writing and shall be sent to the address of Participant as follows, unless and until the EAA is otherwise notified:

THE UNIVERSITY OF TEXAS AT SAN ANTONIO
Attention: Director of Contracts & Industry Agreements
One UTSA Circle
San Antonio, Texas 78249
vpr-ocia@utsa.edu

Section 13.3. Effective Date of Notice. Any notices or communications required to be given in writing by one Party to the other shall be considered as having been given to the addressee on the date the notice of communication is sent by the sending Party. Electronic notices shall be deemed delivered as of the stamp date generated by the receiving Party's system.

ARTICLE XIV – MISCELLANEOUS

Section 14.1. Entire Agreement. This Contract and the attached Exhibits constitute the entire agreement between the Parties regarding the Services to be performed by Participant and there are no representations, agreements or commitments between the Parties except as set forth herein. Unless otherwise authorized herein, no amendments or additions to this Contract shall be binding on the Parties unless in writing and signed by the Parties.

Section 14.2. Non-Waiver. No delay or failure by either Party to exercise any right under this Contract, nor any partial or single exercise of that right, shall constitute a waiver of that or any other right, unless otherwise expressly provided herein.

Section 14.3. Headings. Headings in this Contract are for convenience only and shall not be used to interpret or construe its provisions.

Section 14.4. Governing Law. This Contract shall be deemed to have been executed and performed in the State of Texas and shall be construed in accordance with and governed by the laws of the State of Texas. Venue for any disputes or claims arising from this Contract shall be exclusively in the proper courts in Bexar County, Texas. The dispute resolution process provided for in Section 2009.053(c) of the Texas Government Code shall be used to resolve a dispute arising under this Contract.

Section 14.5. Counterparts. This Contract may be executed in two or more counterparts, each of which shall be deemed an original but all of which together shall constitute one and the same instrument.

Section 14.6. Binding Effect. The provisions of this Contract shall be binding upon and inure to the benefit of the Parties and their respective successors and assigns; provided, however, that Participant may not assign any of its rights nor delegate any of its duties hereunder without the EAA's prior written consent.

Section 14.7. Validity. The invalidity of any provision or provisions of this Contract shall not affect any other provision of this Contract, which shall remain in full force and effect, nor shall the invalidity of a portion of any provision of this Contract affect the balance of such provision.

Section 14.8. Intentionally left blank.

Section 14.9. Survival. Termination of this Contract for breach shall not constitute a waiver of any rights or remedies available at law or in equity to a Party to redress such breach. All remedies, either under this Contract or at law or in equity or otherwise available to a Party, are cumulative and not alternative and may be exercised or pursued separately or collectively in any

order, sequence or combination. In addition to these provisions, applicable provisions of this Contract shall survive any termination of this Contract.

Section 14.10. Attachments. The Exhibits, schedules and/or other documents attached or referred to, are incorporated in and made a part of this Contract for all purposes. As used herein, the expression "Contract" means the body of this Contract and such attachments, Exhibits, schedules and/or other documents, and the expressions "herein," "hereof," and "hereunder" and other words of similar import refer to this Contract and such attachments, exhibits, schedules, and/or other documents as a whole and not to any particular part or subdivision thereof.

Section 14.11. Costs. If any legal action, arbitration, or other proceeding is brought by a Party for the enforcement of this Contract or because of an alleged breach or default of this Contract, the prevailing Party shall be entitled to recover reasonable costs incurred, including but not limited to attorney's fees, in such action or proceeding in addition to any other relief to which it or they may be entitled.

Section 14.12. Authority to Contract. (a) Each Party represents for the benefit of the other Party that: (1) it has the legal authority to enter into this Contract under Section 791.011(a), Texas Government Code, and/or other applicable law; (2) it has the legal authority to provide the Services contracted for under this Contract; (3) this Contract has been duly approved and executed; (4) no other authorizations or approvals are or will be necessary in order to approve this Contract and to enable that Party to enter into and comply with the terms and conditions of this Contract; (5) the person executing this Contract on behalf of each Party has the authority to bind that Party; and (6) the Party is empowered by law to execute any other agreement or documents and to give such other approvals, in writing or otherwise, as are or may hereafter be required to implement and comply with this Contract.

(b) Participant represents that it believes that the contractual payment to be made under this Contract is in an amount that fairly compensates it for the Services performed under the Contract as required by Section 791.011(e), Texas Government Code.

Section 14.13. Officers or Agents. No officer or agent of the Parties is authorized to waive or modify any provision of this Contract. No amendment to or rescission of this Contract may be made except by a written document signed by the Parties' authorized representatives.

Section 14.14. Payment from Current Revenues. As required by Section 791.011(d)(3), Texas Government Code, the EAA, which is the party paying for the performance of the Services, is making all payments required under this Contract from current revenues available to the EAA.

IN WITNESS WHEREOF, this Contract is executed as of the day and date executed by both parties as specified in Section 1.1.

EDWARDS AQUIFER AUTHORITY

THE UNIVERSITY OF TEXAS
AT SAN ANTONIO

By: _____
Roland Ruiz
General Manager

By: _____
Chris G. Green, CPA
Interim Senior Director
Contracts and Industry Agreements

ATTEST:

By: _____
Jennifer Wong-Esparza
Assistant to Board Secretary

APPROVED AS TO FORM:

Deborah Trejo
Legal Counsel
Edwards Aquifer Authority

EXHIBIT A SCOPE OF WORK

BACKGROUND

Project Description

Intensified anthropogenic change in urban areas creates significant pressure on water resources, particularly in semi-arid regions. Van Drecht (2009) projected a rapid increase in nitrogen and phosphorus transport from sewerage systems from 2000 to 2050 due to increasing human populations in the United States. Tracking both pollutant and microbial taxon changes across different sources of treated wastewater contribution across regions of water quality concern is needed, especially in the Contributing Zone of the Edwards Balcones Fault Zone Aquifer.

Treated wastewater is a complex mixture of both chemical and biological constituents, often contributing to freshwater eutrophication, depending on whether it is treated from facilities or non-point leakage from septic systems. Antibiotic resistance, and the genes that encode for resistance, are often upregulated by microbes in impacted riverine and spring-fed streams due to antibiotic pollutants from treated wastewater. Microbial community characterization of dominant groups (in riverine systems, bacteria and micro-algae) often reflects both present and historical pollutant events. Matviichuk et al. (2022) discovered that specific groups of bacteria – Bacteroidetes, a common biomarker for fecal contamination, and Nitrospira, responsible for nitrite oxidation during nitrification, co-occur dependent on specific Antibiotic Resistant Genes (ARGs), suggesting these groups may be “resistome” indicators for water quality efforts. Estimating both antibiotic pollutant concentrations and other pharmaceutical contaminants, genes and mobile elements that code for them, and the microbial taxa responsible for their transferability is a comparative, holistic approach to understanding treated wastewater’s impact on water quality that can capture historical legacy impacts of treated wastewater on riverine ecosystem health.

Objectives and Methodologies

The overall objective of the proposed work is to (1) provide an exploratory evaluation of treated wastewater chemistry in terms of pharmaceutical exposure particularly relevant to antibiotic resistance and wastewater tracking and (2) link the bacterial and algal communities across habitats in freshwater to ARG transport. This project’s PI is Dr. Allison Veach in the Department of Biology, Health and Environment and will support one M.Sc. thesis student – Jun Sheng Lee, who is projected to graduate in December 2028. The proposed work will also support 2 technicians – one M.Sc. student who is experienced in freshwater data collections, Lauren Miranda, for 1 semester and Summer as data collections begin, and 1 undergraduate technician for 1 Summer, TBD. This Contract is anticipated to span a 2-year period ending in December 2027.

Stream and spring sampling

Sampling will occur at 3 regions within the contributing zone – Helotes/Gray Forest Watershed, Cibolo Creek in Boerne TX, and the contributing zone within Hays County. At each of 3 locations, a minimum of 3 sites will be determined – one including an upstream location if possible, at the wastewater treatment outfall and downstream of the outfall. Additional locations will be added during site reconnaissance. All 9 sites will be sampled during a dry season (Summer 2026, and a wet season, Winter/Spring 2027).

The goal is to collect the following datasets:

- Field water quality data (water pH, conductivity, temperature, turbidity, dissolved oxygen curves)
- Water-column nitrate, ammonium, orthophosphate, DOC
- Water-column 16S rDNA bacterial/archaeal communities, 18S rDNA algal/protist communities, all genes for ARG analysis using shotgun metagenomics
- Biofilm 16S rDNA bacterial/archaeal communities, 18S rDNA algal/protist communities, all genes for ARG analysis using shotgun metagenomics
- If possible, fine sediment 16S rDNA bacterial/archaeal communities, 18S rDNA algal/protist communities, all genes for ARG analysis using shotgun metagenomics

Field-data collections

The Participant will use a Hach Pocket Pro+ to measure both water pH, conductivity, temperature, and turbidity at each site prior to sampling water. If requested, the EAA may provide the use of an EAA sonde. Previous work has suggested that deploying a DO probe for an hour will allow validation of redox conditions, therefore, a PME miniDOT probe will be placed within a well-mixed area and allowed to log for 60 minutes upstream of sample collections.

Microbial and water quality sampling

Approximately 10-L of water will be collected at each location to achieve enough genomic DNA to perform shotgun metagenomics. Samples of five 2-liter bottles will be collected in the thalweg, or well-mixed portion of the stream, and kept on ice until arrival at the laboratory. At outfalls, water will be collected from the pipe mouth if possible. At the laboratory, collected water will be filtered through a sterile vacuum-filtration apparatus and filters frozen at -20C until genomic DNA extractions.

For major water chemistry ions (NO_3^- -N, NH_4^+ -N, PO_4^{3-} -P), two 50-mL samples will be collected similarly as microbial sampling except water will be filtered on-site using a 0.22 μm PTFE filter and stored in a sterile falcon tube. An additional sample will be collected for dissolved organic carbon (DOC) and submitted to the San Antonio River Authority for total organic carbon (TOC) analysis. DOC water samples will have a 0.22 μm PTFE filter used to collect the sample into a pre-combusted glass vial, with 20-mL DI water pushed through the filter to prevent carbon leaching from the filter itself. The filtered sample will then be measured for TOC.

Laboratory Procedures

Genomic DNA will be extracted from 0.45 μm nitrate cellulose filters using the Qiagen PowerBiofilm kits. It is expected that all filters extracted will be collected to achieve a final DNA concentration of 250ng required for shotgun metagenomics via Novogene (<https://www.novogene.com>).

Briefly, 16S rRNA genes for bacteria and archaea, and 18S V4 and V9 regions and ribulose-1,5-biphosphate carboxylase large subunit (rbcL) genes will be amplified using known primers and PCR conditions and submitted to the University of Texas Austin Genomics Facility for sequencing on the Illumina MiSeq 2x250bp PE. Shotgun metagenomics will have an aliquot submitted to Novogene who will do all library preparation and sequencing using an Illumina NovaSeq.

Project Schedule

Project deliverables span January 2026 to December 2027, including 2 years of total support for a M.Sc. student, Jun Sheng Lee. Jun began Fall 2025 as a technician for his first semester and will begin his thesis in Spring 2026. The goal will be to complete both sampling collections by end of the Spring semester of 2027.

Project Tasks	SPR 2026	SUM 2026	FALL 2026	SPR 2027	SUM 2027	FALL 2027
River sampling						
DNA extracted						
All libraries analyzed						
Proposal defense						
Data analysis complete						
Thesis defense						

Task 3 – Deliverables

Objective 1: Participant will develop and submit a Master’s thesis addressing the primary research question, and a minimum of 1 peer-reviewed publication.

Objective 2: Participant will submit a data package including all lab analysis results in an electronic deliverable method to EAA staff.

References

Van Drecht, G., A. F. Bouwman, J. Harrison, and J. M. Knoop. (2009). Global nitrogen and phosphate in urban wastewater for the period 1970 to 2050. *Global Biogeochemical Cycles* 23.

Matviichuk, O., L. Mondamert, C. Geffroy, M. Gaschet, C. Dagot, and J. Labanowski. (2022). River biofilms microbiome and resistome responses to wastewater treatment plant effluents containing antibiotics. *Frontiers in Microbiology* 13:795206.

**EXHIBIT B
PROJECT BUDGET**

During the Contract period, the EAA will provide approximately 0.09 person months of the PI's (Dr. Veach) summer salary and fringe benefits (\$3,612); salary and fringe benefits for a Graduate Student (\$76,481); hourly wages for a Research Assistant of \$20,791; Materials and Supplies for analysis at \$83,776; \$13,708 for travel; and \$4,575 for publication costs. This includes an additional 52% for indirect and overhead costs during part of Period 1, and then 52.5% indirect costs beginning the Participant's Fiscal Year 2026 (9/2026) and remains throughout Period 1 and Period 2. This will be distributed over the Contract period as deemed fit by the EAA and Participant. In no event shall the amount paid under this Contract exceed \$232,943.

Fiscal Year	Personnel	Salary and Fringe	Indirect Cost	Total
2025-26	PI	\$1,169	\$610	\$1,779
2025-26	GRA	\$25,154	\$13,122	\$38,276
2025-26	Grad Technician	\$9,850	\$5,138	\$14,988
2025-26	Tuition and Fees	\$18,000	\$0	\$18,000
2025-26	Materials and Supplies	\$30,000	\$15,651	\$45,651
2025-26	Travel	\$5,000	\$2,608	\$7,608
2025-26 Total		\$89,173	\$37,129	\$126,302
2026-27	PI	\$1,202	\$631	\$1,833
2026-27	GRA	\$25,053	\$13,152	\$38,205
2026-27	Technician	\$3,805	\$1,998	\$5,803
2026-27	Tuition and Fees	\$12,000	\$0	\$12,000
2026-27	Materials and Supplies	\$25,000	\$13,125	\$38,125
2026-27	Travel	\$4,000	\$2,100	\$6,100
2026-27	Publication	\$3,000	\$1,575	\$4,575
2026-27 Total		\$74,060	\$32,581	\$106,641
Total Cost				\$232,943

The estimated budget breakdown, by task, is shown in the table below.

Tasks	Budgetary Allocation
1. Sampling	35%
2. Lab Analysis	40%
3. Deliverables	25%