



MEMORANDUM OF UNDERSTANDING

ON

Ecosystem Research on Water Reuse, Groundwater, and Surface Water Interactions to Evaluate Approaches that Improve Water Quality and Quantity with Nature-Based Infrastructure

BETWEEN THE

U.S. ENVIRONMENTAL PROTECTION AGENCY

AND THE

City of Norman & Norman Utilities Authority

I. PURPOSE/OBJECTIVES/GOALS

A. PURPOSE

The purpose of this MOU is to facilitate research cooperation and coordination between the U.S. Environmental Protection Agency's (USEPA) Office of Research and Development, Center for Environmental Solutions and Emergency Response, Groundwater Characterization and Remediation Division (U.S. EPA/ORD/CESER/GCRD) and the City of Norman ("CON") and the Norman Utilities Authority ("NUA"). In general, the parties intend to focus on research related to water reuse, groundwater, and surface water interactions to explore potential nature-based approaches like wetlands and restoration for improvements to water quality and quantity.

B. OBJECTIVES

Engage in research related to municipal wastewater reuse of treated discharge conveyed to nature-based environmental buffers, like wetlands, to better enhance the parties' understandings of water quality impacts in water reuse projects.

C. GOALS

Develop collaborative research and establish a site where the potential nutrient and water quality effects of nature-based solutions to water scarcity will enhance our ability to provide important scientific evidence about the groundwater, surface water, and water quality benefits of a nature-based constructed wetland solution for indirect potable reuse. This project also addresses using science to identify best practices to manage land and water resources to adapt to changes in the environment by conducting a comprehensive survey of reclamation water quality challenges in the context of research results from studies on constructed wetlands.

II. BACKGROUND

Water scarcity is an ongoing concern throughout the nation. The reuse of highly treated effluent can support the demands of water quantity of downstream users, provide habitat benefits, and protect water quality for river and receiving waters. This has led municipalities and states to move towards approaches that incorporate reuse to augment existing water sources. However, the public frequently opposes the notion of directly reclaimed water as part of their potable water supply, regardless of the degree of treatment at a water reclamation facility. Indirect potable reuse offers the advantage of an “environmental buffer” between the point of effluent discharge and entry into the potable water supply source. Naturally occurring physical, chemical, biogeochemical, microbiological, and ecological processes in the environmental buffer may also have beneficial effects on water quality. These nature-based solutions, particularly floodplain restoration and wetland construction, may be beneficial to support water quality, minimize pollutant loads and support greater habitat. Currently, case studies and scientific data on the effects of these nature-based solutions are scarce and guidance for permit writers or decision makers is limited.

In the state of Oklahoma and throughout regions with limited water supplies, novel applications of water repurposing and reuse are being developed. The benefits of additional water are clear; however, the effects of the reused water on existing water supplies and the receiving waterbodies would benefit from further study, data, and evaluation. At the City of Norman’s wastewater treatment facility and surrounding properties, the parties intend to collaborate on research related to municipal wastewater reuse relevant to regions where wastewater reuse is a possible solution to water scarcity. Improved understanding of the interaction between surface and groundwater as well as chemical transformations of nutrients or other pollutants in treated discharge conveyed to these nature-based environmental buffers can help improve decision making and help better understand the potential risks and benefits.

The parties intend to focus on the area on and around the City of Norman where water demands are expected to grow. Lake Thunderbird, constructed in the early 1960s, provides Municipal and Industrial water to approximately 250,000 people. Norman anticipates that additional water supplies are necessary to support the city’s growing demands, which is expected to double over the next 40 years. The City of Norman is working to increase water availability by repurposing treated water that is discharged to environmental water in a wetland and then distributed to Lake Thunderbird. This would increase reservoir storage, making more water available as demand grows. The research done at this site may show how wetland and other floodplain restoration activities may support protection of groundwater, surface water, and help meet designated use requirements. In this effort, the parties intend to perform and share research on the water quality and quantity effects of receiving water to evaluate approaches of effluent water reuse that incorporate wetlands and river floodplains with the intention to support practical and applicable decision making.

III. AUTHORITIES

USEPA enters into this MOU pursuant to Section 104 of the Clean Water Act, 33 U.S.C. 1254.

IV. ROLES AND RESPONSIBILITIES

A. CON/NUA staff intend to work with the USEPA scientists to coordinate research in such a way as to minimize any negative impact that USEPA activities might have on other users or activities at the wastewater plant and surrounding area. CON/NUA staff intend to work with USEPA science leads to plan

research activities, suggest viable alternatives that might be considered, identify the best means of access to possible sites and identify archived information that might be informative regarding the history or current condition or characteristics of possible sites for intensive scientific investigation. CON/NUA intends to provide access to USEPA scientists and staff to field and lab facilities at the wastewater treatment plant and surrounding area to install equipment including monitoring wells and loggers and collect research samples. CON/NUA intends to contact USEPA in a timely manner should it come to their attention that natural or man-made situations could impact the research activities.

B. USEPA intends to conduct ecosystem research on water reuse, groundwater, and surface water interactions to evaluate approaches that improve water quality and quantity with nature-based infrastructure for the next five field seasons beginning in March 2023 at CON/NUA wastewater treatment facility. USEPA staff intend to gather baseline data and evaluate extant data that might be available, collect data from instrumented above and below ground sensors, evaluate results of riparian vegetation and soil inventories, and interpret fine-grained information from remote sensing. USEPA intends to collect surface water, groundwater, and soil samples on a quarterly to monthly basis. These sampling efforts may take a few hours to all day long. Sampling may only be done at the site during working hours.

Data collection may require installation of monitoring wells, sensors and data loggers, routine field visits to download data, service equipment and sample collections. This work is going to be directed at evaluating what indicators or metrics are most appropriate to be used in characterizing and quantifying groundwater and surface water interactions and water quality. All information, documents and presentations relating to CON/NUA work is intended to be made available to CON/NUA soon after passing Quality Assurance review by USEPA.

USEPA's state-registered driller may install ten (10) ground water monitoring wells about ~3m deep or a ~meter into the shallow groundwater on site. USEPA may install another ten (10) mini piezometers (small hand driven wells that are temporary ½" tubing). USEPA may install the monitoring wells above grade with bollards or flush mount after consultation with CON/NUA's designated contact to determine what is best for the site. When the research is complete, USEPA may either remove or leave the monitoring wells on site after consultation with CON/NUA's designated contact.

As part of the well installation, USEPA may collect soil and shallow core samples at up to ten (10) sites. USEPA may also do a few or many hand cores, up to 0.25m depth in soil and sediments.

If USEPA determines collection and research work needs to be done on effluent prior to discharge or final treatment appropriate access, as needed, can be granted to USEPA in writing at that time.

USEPA will probably discharge well water to the surface as part of the collection efforts and there will be some loose soil from drilling. USEPA will make reasonable efforts to keep the work areas tidy after drilling and sampling.

USEPA staff intends to work on the efforts under this MOU with a strong sense of responsibility, cooperation, and respect. USEPA intends to minimize disruption to CON/NUA's routine operations and to request permission for all operations and access in advance from CON/NUA.

C. The current intended locations where CON/NUA and USEPA are conducting activities addressed in this MOU are located at the properties set out in Exhibit A.

D. It is the intent of USEPA and CON/NUA to collaborate in developing research plans, access to data, experimental designs, education and outreach information (i.e. charts, posters, presentation, public meetings) from the combined research that would be suitable for a variety of intended audiences, the overall purpose of which is expected to explain the concept of water reuse and activities at the site. The combined research collaboration is intended to lead to an improved combined mutual understanding of water reuse and nature-based solutions related to wastewater and wetland construction or restoration activities including peer reviewed publications. The parties intend to maintain two-way communications throughout the performance of this MOU.

V. LIMITATIONS

A. All commitments made in this MOU are subject to the availability of appropriated funds and each party's budget priorities. Nothing in this MOU, in and of itself, obligates CON/NUA or USEPA to expend appropriations or to enter into any contract, assistance agreement, interagency agreement, or incur other financial obligations that would be inconsistent with Agency budget priorities. CON/NUA waive any claims for compensation for services rendered to USEPA for activities it undertakes in carrying out this MOU unless and except under prior mutual agreement by both parties. This MOU does not exempt CON/NUA from USEPA policies governing competition for assistance agreements.

B. This MOU is neither a fiscal nor a funds obligation document. Any endeavor involving reimbursement or contribution of funds between the parties to this MOU will be handled in accordance with applicable laws, regulations, and procedures, and will be subject to separate subsidiary agreements that will be effected in writing by representatives of both parties.

C. Except as provided in Section VII. INTELLECTUAL PROPERTY, this MOU is not legally binding and does not create any right or benefit, substantive or procedural, enforceable by law or equity against CON, NUA or USEPA, their officers or employees, or any other person. This MOU does not direct or apply to any person outside CON, NUA and USEPA.

D. Nothing in this MOU constitutes an endorsement by either party of the other, including any products or services, or any fundraising activity or promotion. CON/NUA agree not to make statements to the public in news releases, product brochures, on web sites or in any media that imply USEPA endorsement of CON/NUA products or services. In addition, The CON/NUA agree not to make statements that imply that USEPA supports its efforts to raise public or private funds. Any statements or promotional materials prepared by CON/NUA that describes this MOU must be approved in advance by USEPA. CON/NUA may make factual statements to the public that describe their cooperation with USEPA.

E. Nothing in this MOU alters the statutory, regulatory or other authority or responsibilities of the EPA. This MOU does not supersede existing agreements or restrict any future agreements between CON/NUA and the EPA.

VI. PROPRIETARY INFORMATION

To carry out the joint work resulting from this MOU, CON/NUA may need to disclose proprietary information to USEPA. For the purpose of this MOU, proprietary information is defined as commercial or financial information that an affected business claims to be confidential and is not otherwise available to the public. CON/NUA agree to clearly identify as such proprietary information disclosed to USEPA in writing; and to clearly memorialize in writing, within a reasonable time, any proprietary information initially disclosed orally. USEPA agrees not to disclose, copy, reproduce or otherwise make available in any

form whatsoever to any other person, firm, corporation, partnership, association or other entity information designated as proprietary information without consent of CON/NUA except as such information may be subject to disclosure under the Freedom of Information Act (5 U.S.C. § 552), and EPA's regulations at 40 C.F.R. Part 2, Subpart B, or as otherwise authorized by law.

VII. INTELLECTUAL PROPERTY

A. The parties agree that any copyrightable subject matter, including but not limited to journal articles, training, educational or informational material or software, created jointly by the parties from the activities conducted under the MOU may be copyrighted by CON or NUA. Further, if CON or NUA intends to disseminate the work(s) outside of the United States, CON or NUA may secure copyright to the extent authorized under the domestic laws of the relevant country. CON and NUA hereby grant to the U.S. federal government a royalty-free, worldwide, nonexclusive, irrevocable right to reproduce, distribute, publish, display or perform the work(s) publicly, to make derivative works and, in regard to all of the above-referenced uses, to authorize others to do the same on its behalf.

B. The parties agree that any patentable invention made pursuant to the terms of this MOU will be owned by the inventing party in accordance with U.S. patent law. The parties further agree that any patentable invention made jointly by both parties will be owned by both parties as co-owners in accordance with U.S. patent law. Respective rights in inventions made pursuant to the terms of this MOU may be assigned or licensed under a separate agreement.

VIII. QUALITY ASSURANCE

For collaborations that involve scientific research, USEPA intends to implement the Agency's Environmental Information Quality Policy (CIO 2105.1). Participants and USEPA will collaboratively develop quality planning documentation (e.g., a Quality Assurance Project Plan (QAPP)), or equivalent) that satisfactorily meets quality program standards such that the research produces environmental information of known and documented quality.

IX. POINTS OF CONTACT

The following individuals are designated points of contact for the MOU:

U.S. Environmental Protection Agency:

Kenneth J. Forshay,
919 Kerr Research Drive,
Ada, OK 74820
phone 580-436-8912
forshay.ken@epa.gov

City of Norman and Norman Utilities Authority

Christopher A. Mattingly,
City of Norman
P.O. Box 370,
Norman OK 73070

(405) 366-5494
chris.mattingly@normanok.gov

X. MODIFICATION/DURATION/TERMINATION

This MOU will be effective when signed by all parties. This MOU may be amended at any time by the mutual written consent of the parties. The parties will review this MOU every 5 years to determine whether it should be revised, renewed, or cancelled. This MOU may be terminated by either party at any time by one party notifying the other party in writing 90 days in advance of the termination date.

XI. APPROVAL

The City of Norman and Norman Utilities Authority

U.S. Environmental Protection Agency

Larry Heikkla, Mayor and Chair

Greg Sayles, Ph.D.

Director

Center for Environmental Solutions and
Emergency Response

Title:

(Date)

(Date)

ATTEST:

City Clerk

CITY OF NORMAN:

Approved as to form and legality this 17 day of August 2023.


City Attorney

EXHIBIT A

Location of accessible floodplain and river area
outside of the wastewater treatment plant facility.

