State of Missouri
2021 Governor's Award for Quality and Productivity
GUIDELINES

PURPOSE
The Governor's Award for Quality and Productivity (GAQP) recognizes teams that champion service excellence, efficiency and process improvement, and innovation in Missouri state government. All projects must meet requirements of effectiveness, responsiveness, and efficiency of such magnitude that would make the project a model of excellence in state government nationally.

ELIGIBILITY
Any team of individuals employed by the State of Missouri who worked together to implement a project within their own agency, or who have worked with another section, division, department, agency, organization or business to implement a project which exemplifies the purpose of the GAQP, may submit a nomination. The combined number of individuals representing any team should consist of **2 to 20 team members** (<u>maximum</u>) – the majority of whom are state employees.

Teams must provide documentation which includes, but is not limited to, background information, measures, and other supporting material that demonstrates the impact of the project. Projects are encouraged to demonstrate the potential for replication in other jurisdictions or settings.

Once a nomination has been approved by the department/agency and submitted for consideration for the GAQP, additional team members <u>may not</u> be added.

All projects must have been in existence long enough to have a **<u>measurable</u>** impact.

EXECUTIVE SUMMARY
Describe (in 500 words or less) the initial challenge, research, problem-solving measure, documentation, results, etc. Executive summary page must be typed in 12 point, Times New Roman font, and left justified. **Attach the executive summary to the front of the nomination**. [A blank Executive Summary document is available at the end of this document.]
<u>Video Summary:</u> A brief - no longer than three minute - video summary may also be submitted via a link. Submission of a video summary is optional.

NOMINATION PROCESS
A team of managers, directors, and/or state executives reviews nominations and selects the winners of this award which recognizes successful teams in Missouri state government.

1. Secure nomination packet from your [agency/department GAQP coordinator](#) or on the GAQP web page at http://www.training.oa.mo.gov/erp/index.htm.
2. Complete the nomination form (providing ALL information requested)
3. Forward completed nomination form to the [agency/department GAQP agency coordinator](#).
4. Agency/department GAQP coordinator reviews nomination form and ensures that all information and documentation is complete and accurate.
5. Agency/department coordinator secures agency/department director endorsement signature and forwards completed nomination packet to GAQP state program coordinator.
6. **<u>Do not submit hard copies of information, documentation, videos, etc.</u>**

Customer Service

The winning team(s) will identify and develop measures to improve customer service in Missouri state government. The winning project(s) will establish how its development and implementation provided the agency a means to more effectively satisfy customer, stakeholder, and public expectations. This will include, but is not limited to, communication, information, responsiveness, resolution of problem(s), and on-time, reliable, consistent customer service delivery.

Efficiency / Process Improvement

The winning team(s) will develop an effective and creative approach in using state resources to implement a new process or deliver a product or service. Implementation of the winning project must have improved the overall quality of products and services, significantly enhanced operational efficiency, simplified work processes, generated increased revenues, or reduced spending.

Innovation

The winning team(s) will develop and implement a new process/product/service or a better application to an existing process/product/service to create an "added value" to state government. The winning project will deliver benefits to the citizens of Missouri through advances in vital services such as healthcare, education, communications, transportation, etc.

Pinnacle Award

The winning team will be chosen from a nominated team if, in the opinion of the Selection Committee, the nomination clearly encompasses multiple award categories in a manner that exemplifies the spirit of the Governor's Award, or exceeds all other nominations. This award is not open for nomination and may only be used by the GAQP Selection Committee.

Examples of previous winning nominations for the above categories are available by visiting the following link: previous winning nominations.

Agency/Department Coordinator Forwards Complete Packet to:

Governor's Award for Quality and Productivity
Office of Administration – Division of Personnel
Attn: Julie Schlup
Truman State Office Building, Room 430
301 East High Street
Jefferson City, MO 65101

Julie.Schlup@oa.mo.gov
573-522-1336

http://www.training.oa.mo.gov/recognition.htm

State of Missouri – 2021 Governor's Award for Quality and Productivity

NOMINATION FORM

I. GENERAL INFORMATION

Department: Natural Resources (DNR), Health and Senior Services (DHSS), Department of Corrections (DOC), Department of Mental Health (DMH), Missouri Veteran's Commission (MVC), University of Missouri (MU)

1. **Project or team name:** The Missouri Coronavirus Sewershed Surveillance Project (CSSP)

2. **List the name of all team members, job titles, state agency department, and/or other organizations including public, private sector or business:** *(Please list alphabetically by last name – 2 to 20 team members maximum.)*
   1. Anthony Belenchia, Research/Data Analyst, Bureau of Environmental Epidemiology, DHSS
   2. Todd Blanc, Environmental Scientist, Water Protection Program, DNR
   3. Trevor Foley, Director of Budget and Finance, DOC
   4. John Hoke, Water Protection Section Chief, Water Protection Program, DNR
   5. Timothy Hoyer, Capital Improvement Specialist II, MVC
   6. Hsinyeh Hsieh, PhD, Senior Research Scientist, MU
   7. Hwei-yiing Johnson, Epidemiologist, Bureau of Environmental Epidemiology, DHSS
   8. Marc Johnson, PhD, Professor, School of Medicine, MU
   9. Jessica Klutts, Environmental Program Analyst, Water Protection Program, DNR
   10. Cindy LePage, Environmental Engineer IV, Water Protection Program, DNR
   11. Chung-Ho Lin, PhD, Research Associate Professor, School of Natural Resources, MU
   12. April Maxwell, Director of State Operated Programs, DMH
   13. Jeff Patridge, GIS Specialist, Bureau of Environmental Epidemiology, DHSS
   14. Scott Patterson, Senior Research/Data Analyst, Bureau of Environmental Epidemiology, DHSS
   15. Robert Reitz, Director of Psychiatric Facilities, DMH
   16. Melissa Reynolds, Senior Epidemiology Specialist, Bureau of Environmental Epidemiology, DHSS
   17. Aaron Schmidt, Disaster Response Coordinator, DNR
   18. Elizabeth Semkiw, Epidemiologist, Bureau of Environmental Epidemiology, DHSS
   19. Jeff Wenzel, Bureau Chief, Bureau of Environmental Epidemiology, Bureau of Environmental Epidemiology, DHSS
   20. Chris Wieberg, Water Protection Program Director, Water Protection Program, DNR
   21. Sally Zemmer, Environmental Program Specialist, Water Protection Program, DNR

3. **Nomination Category**: *(Check only one.)*
   ☒ INNOVATION   ☐ CUSTOMER SERVICE

   ☐ EFFICIENCY / PROCESS IMPROVEMENT

4. **Explain why you selected this category:**

The Coronavirus Sewershed Surveillance Project (CSSP) is an innovative project that provides Missouri state and local public health agencies with a new source of epidemiological data to inform public health efforts in response to the coronavirus pandemic. With the creation of CSSP, the State of Missouri now has a framework to quickly: (1) collect and test wastewater for SARS-CoV-2 (or future pathogens of interest); and (2) analyze, interpret and distribute wastewater data to municipalities and state-owned facilities to help mitigate potential disease outbreaks. CSSP is one of the first and largest of its kind in the United States, and is a leading example for similar projects starting across the nation.

II. BACKGROUND

1. **When did the team begin its work?**
April 28th, 2020

2. **What date did the team initiate the implementation phase of the project?**
July 6th, 2020

3. **Is the project:**
   ☐ Time Limited   ☐ Completed   ☒ Ongoing

III. PROJECT DESCRIPTION

1. **Why was the project necessary?**
The ongoing COVID-19 pandemic, caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), continues to negatively impact the health and wellbeing of Missouri citizens. CSSP was created as an additional tool to help mitigate the impact of COVID-19. In the early days of the pandemic, clinical testing was limited and we quickly learned that transmission by asymptomatic individuals was a problem. Wastewater testing is a fast, cost-effective way to obtain unbiased estimates of SARS-CoV-2 infection prevalence and monitor trends in a community. Wastewater data can provide local public health agencies (LPHAs), municipalities and congregate living facilities up to three to five days advanced notice of potential increases in COVID-19 infections and time to implement containment measures. Throughout the course of the pandemic, CSSP has evolved to meet new challenges, such as the need for increased testing capacity and tracking the distribution of variants throughout the state.

2. **What were the primary goals of the project?** *(150 words or less.)*
The primary goals of the CSSP are to: 1) evaluate the geographic distribution of SARS-CoV-2 in Missouri; 2) identify trends in SARS-CoV-2 prevalence; and 3) conduct targeted monitoring for indicators of SARS-CoV-2 reemergence to inform mitigation efforts. Identifying areas or facilities where prevalence has increased, enables state and local public health officials to target resources, such as testing and vaccination events, at areas where they are most needed.

3. **Describe the project:** *(200 words or less.)*
The purpose of CSSP is to monitor wastewater for SARS-CoV-2 to reduce COVID-19 impacts. CSSP is a highly collaborative project involving DNR, DHSS, and researchers at MU, as well as municipalities, DOC, MVC, and DMH congregate facilities, and universities across the state. SARS-CoV-2 is shed in human feces and detected in sewage by testing for genetic markers. There is generally a robust correlation between the viral load in wastewater and the number of cases in an area. Missouri initiated CSSP in April 2020, forming a workgroup and developing a pilot project. In May 2020, nine municipal wastewater treatment facilities participated in a six week pilot to evaluate the feasibility of sample collection, transportation, analysis, and distribution of test results to public health entities. The pilot utilized existing DNR, DHSS, and MU personnel and infrastructure to develop a logistical project framework, and demonstrated analytical techniques were successful in detecting even small amounts of viral material. The statewide project has now expanded to testing over 130 weekly samples from municipal WWTFs, congregate living institutions, and universities statewide. CSSP monitors for trends and alerts communities and institutions of potential increases in infections, and now also routinely tests for variants.

4. **What technology, if any, was used in the development, implementation, maintenance or measurement of the project?** *(150 words or less.)*
Because most DNR and DHSS staff were working remotely throughout the project's development phase, CSSP workgroup members used virtual meeting technologies to coordinate all aspects of the project, including holding virtual town hall meetings with participants. Participating facilities use automated sampling devices to collect composite samples over a 24-hour period. The project utilizes the existing DHSS courier system to transport samples to the laboratory at MU. MU uses an Applied Biosystems 7500 Fast Real-time

PCR machine to quantify SARS-CoV-2 in wastewater and Illumina MiSeq high throughput sequencing to screen for variants. DHSS uses cloud technologies for data distribution to communities and LPHAs, and developed an online public facing ArcGIS StoryMap to display results. For data analysis, geographic data for sewersheds had to be digitized in order to match sewershed results to geocoded clinical data.

5. **Explain how the accomplishment of the team exceeds its regular duties and responsibilities.**
   (150 words or less.)

DNR, DHSS, and MU applied their collective technical, analytical, and logistical expertise to setup and deploy a statewide project encompassing over 120 facilities in addition to their regular duties. Missouri's CSSP is likely the largest project of its kind currently in the United States and continues to receive requests from communities and institutions in the state wishing to be included in the project. The team often attends calls, conferences, and meetings to advance other projects in the country. The CSSP is working to contribute to CDC's nationwide effort to collect wastewater data and has also contributed to standardizing analytical methods. CSSP MU researchers are working to improve methods and explore factors that may impact results, and are publishing their findings in peer-reviewed scientific journals. Finally, CSSP is exploring other future public health applications of wastewater testing that would benefit the citizens of Missouri.

6. **Which of the following describes the intended benefits of the project?** (Check all that apply and provide an explanation. - 150 words or less)

   ☒ Cost Reduction ☐ Time Savings ☒ Increased Effectiveness
   ☐ Improved Process ☐ Other: Describe

Explain the intended benefits: Wastewater surveillance is a cost-effective, proactive means to inform public health strategy and help mitigate disease spread. Sewage testing provides additional, population-level information about virus levels in a community that is not captured by patient testing and can provide early warning of potential outbreaks in communities and congregate living facilities. Additionally, wastewater surveillance can help reduce costs by directing testing and other resources to areas where prevention and containment can be most effective. For example, DOC uses wastewater surveillance data to reduce testing costs through targeted testing at facilities where increases in wastewater viral loads indicate extra containment measures are needed to stop the spread of disease.

IV. RESULTS / MEASUREMENT

1. **Explain how the success of the project was measured and what outcomes were achieved.** (Explanation should not exceed 300-500 words.)

   - **Measure 1**: Demonstrate utility of wastewater data as a tool to predict potential increases in COVID-19 cases in communities
     o Project data analysis demonstrates that a statistically significant increase in a sewershed's viral load is typically followed 4 to 6 days later by an increase (at least 25%) in cases in that area.

   - **Measure 2**: Increase project impact by expanding geographic coverage
     o Expanded testing capacity from 66 samples per week in July 2020 to 170 in July 2021
     o Expanded from testing locations in 40 to 57 counties
     o Estimated to cover 63% of the population of Missouri, one of the largest projects in the nation

   - **Measure 3**: Help mitigate disease impacts at state-owned congregate facilities
     o Expanded testing to 21 DOC, 8 DMH, and 7 MVC facilities, and increased testing frequency to twice per week at each facility to provide earlier detection and additional response time
     o In 2021, DOC initiated over 35 testing events (a total of 2,902 clinical tests administered) based on wastewater results. In one testing event, 146 positive cases were identified and the facility was able to implement mitigation efforts a full week before COVID-19 symptoms appeared in the population.

- **Measure 4**: Make CSSP results publically available
  - o DHSS published a project [Storymap](#) that has had over 24,400 visits since launching in January 2021. The storymap displays weekly trends in wastewater viral loads over the entire project period at each participating municipality.
  - o In April 2021, DHSS added a variant tracking map that has now received over 8,200 visits.
  - o DHSS provides weekly data updates to 80 LPHAs in 80 counties

- **Measure 5**: Advance the science of wastewater epidemiology
  - o Contributing to national efforts to study wastewater methods and their epidemiological uses by sharing data with CDC's National Wastewater Surveillance System (NWSS) database
  - o Awarded $2 million NIH grant to study methods and impacts of unknown variables on genetic signal in wastewater
  - o Researchers at MU have submitted two publications to peer-reviewed journals:
    - ▪ Robinson et al. (2021) Characterization of SARS-CoV-2 Genetic Material in Wastewater. In review, *Science of the Total Environment*
    - ▪ Gregory et al. (2021) Monitoring SARS-CoV-2 Populations in Wastewater by Amplicon Sequencing and Using the Novel Program SAM Refiner. In press, *Viruses*
  - o Presented to national organizations, including Association of Public Health Laboratories, Association of State and Territorial Health Officials, Council of State and Territorial Epidemiologists, American Society of Civil Engineers
  - o Offered technical assistance, lab methods, and experiences to assist other states in implementation of projects

- **Measure 6: Promote value of wastewater surveillance as a public health tool**
  - o Participated in numerous media interviews to deliver information about CSSP to broad audiences. To date, CSSP has been covered in 187 placements nationwide, with a potential reach of 1.1 billion people. Some specific examples include:
    - ▪ Missouri Municipal Review, "[Coronavirus Sewershed Surveillance Project](#)" May/June 2021
    - ▪ New York Times, "From the Wastewater Drain, Solid Pandemic Data" 5.7.21
    - ▪ [ABC News](#) 6.23.21

2. **Are the benefits derived from this project:** (Check only one.)

   ☒ Recurring ☐ One-time

3. **If recurring, how will the benefits be sustained?** (Explain in 150 words or less.)

DHSS has secured funding from the CDC's ELC grant to continue sewershed testing for SARS-CoV-2 and variants through 2022. CSSP has also been awarded an NIH grant to study factors of sewershed results, such as chemicals in the sewer systems, hold times for samples, and how much virus is shed per infected person. In addition, CSSP infrastructure could provide a basis to implement testing for other infectious diseases and chemicals of public health concern.

V. RECOGNITION / AWARDS

1. **Has this project previously been nominated for the Governor's Award for Quality and Productivity? If yes, when?**

Yes. 2020

2. **If yes, for which category was it nominated?**

Innovation

3. Has this project received any other awards or recognition? If yes, describe.

VI. NOMINATOR'S INFORMATION

Nominating Department: Department of Natural Resources

Name: Chris Wieberg   **Signature:**

Telephone Number: 573-522-9912   **E-Mail Address:** chris.wieberg@dnr.mo.gov

VII. DEPARTMENT COORDINATOR'S INFORMATION

Name: Forrest Luck   **Signature:**

Telephone Number: 573-522-9395   **E-Mail Address:** forrest.luck@dnr.mo.gov

VIII. DEPARTMENT DIRECTOR APPROVAL

Department Director's Name: Dru Buntin,   **Signature:**
                                 Acting Director

Nomination must be signed ONLY by the Department Director to be eligible for consideration. Nominations not signed by the Department Director will be returned to the agency coordinator.

Project or Team Name: Coronavirus Sewershed Surveillance Project (CSSP)

Nominator: Chris Wieberg

Nominating Department: (Nominations must include names of all agencies/departments/organizations/ businesses, etc.)

Department of Natural Resources

Category: Innovation

Executive Summary: Executive Summary page must be 500 words or less, 12 point, Times New Roman font, and left justified. **Attach the Executive Summary to the front of the nomination.**

Video Summary: A brief - no longer than three minute - video summary may also be submitted via a link. Submission of a video summary is optional.

State of Missouri
2021 Governor's Award for Quality and Productivity
Nomination Checklist

The Nomination Checklist is for your assistance to ensure that you have completed all parts of the nomination package. **Do not include this checklist with nomination packet.**

- Verify all team members have been included on the nomination form [maximum of 20 team members, the majority of whom are state employees]. **Once the nomination has been submitted additional team members may not be added**.

- Check to make sure all names are spelled correctly and listed alphabetically by **last name**. (Verify spelling of all team members names.)

- Include the job titles and agency/organization of all team members.

- Complete the **Executive Summary** and attach to the **front** of the nomination form. It should include why this project is exceptional, why the citizens of Missouri should be proud of this team, and why the accomplishments are beyond regular responsibilities.

- Forms can be downloaded on the GAQP web page at http://www.training.oa.mo.gov/erp/index.htm. Enter responses to all questions (reference each section and number clearly) on an original or copy of the nomination form.

- Confirm point of contact and telephone number.

- Review nomination to ensure:
  - acronyms and technical terms are clearly identified and understandable to the average reader;
  - supporting documentation is provided; and
  - measurement for the project has been included in the nomination.

- Forward completed nomination packet to agency coordinator for verification.

For more information visit the website listed below or contact:

GAQP State Program Coordinator
Julie Schlup
573-526-1336
Julie.Schlup@oa.mo.gov

Executive Summary
Coronavirus Sewershed Surveillance Project

Tracking the circulation of SARS-CoV-2 and variants to mitigate COVID-19 impacts is an ongoing challenge. Since May 2020, the Missouri Departments of Health and Senior Services (DHSS) and Natural Resources (DNR) have collaborated with researchers at the University of Missouri–Columbia (MU) on a statewide project, the Coronavirus Sewershed Surveillance Project (CSSP), to test domestic wastewater for genetic markers of SARS-CoV-2, the virus that causes COVID-19. This project utilizes wastewater samples to identify the geographic distribution of SARS-CoV-2 and variants throughout Missouri and monitor for indicators of outbreaks within communities.

SARS-CoV-2 virus is shed in human feces and the amount of viral material in sewage correlates with the number of reported cases in a sewershed (the area that drains into a community's wastewater collection system). Wastewater surveillance is a cost-effective way to gather community-level information not captured by clinical testing, either because people are asymptomatic or do not get tested. It can also provide early awareness of virus reemergence and variant arrival in communities, making it an increasingly valuable tool for statewide COVID-19 surveillance. Data from Missouri's wastewater surveillance project demonstrate that significant increases in sewershed viral loads are typically followed four to six days later by increases (of at least 25%) in the number of reported cases in that area.

DNR works with wastewater treatment facilities, congregate living facilities, and universities across the state to coordinate sample (untreated wastewater) collection. Researchers at MU laboratories then measure the amount of SARS-CoV-2 material in the wastewater samples. DHSS analyzes data and distributes results to alert local public health agencies and facilities in areas where wastewater viral loads are increasing.

CSSP has grown in size and scope as the pandemic has progressed. The project has expanded from nine initial test locations to 86 wastewater treatment plants, six universities, and 38 state owned congregate-living facilities (DOC, DMH, and MVH) throughout Missouri, and now covers 63% of the state's population. In January 2021, DHSS launched a CSSP GIS StoryMap to share project results with the public. In February 2021, CSSP began screening wastewater samples for variants of concern, and is now integral to monitoring variants in the state. CSSP is currently funded through 2022 by a Centers for Disease Control and Prevention grant through DHSS.