Permit No. CP0002528

STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION

CONSTRUCTION PERMIT

The Missouri Department of Natural Resources hereby issues a permit to:

City of O'Fallon
Steve Bender, Public Works Director
O'Fallon Wastewater Treatment Plant
150 Firma Road
O'Fallon, MO 63366

for the construction of (described facilities):

See attached.

Permit Conditions:

See attached.

Construction of such proposed facilities shall be in accordance with the provisions of the Missouri Clean Water Law, Chapter 644, RSMo, and regulation promulgated thereunder, or this permit may be revoked by the Department of Natural Resources (department).

As the department does not examine structural features of design or the efficiency of mechanical equipment, the issuance of this permit does not include approval of these features.

A representative of the department may inspect the work covered by this permit during construction. Issuance of a permit to operate by the department will be contingent on the work substantially adhering to the approved plans and specifications.

This permit applies only to the construction of water pollution control components; it does not apply to other environmentally regulated areas.

May 15, 2025
Effective Date

May 14, 2027
Expiration Date

John Hoke, Director, Water Protection Program

CONSTRUCTION PERMIT

I. CONSTRUCTION DESCRIPTION

Construction of approximately 1300 lf of 14-inch forcemain to an existing earthen basin, cell 2. Actuated plug valves will be installed on the forcemain and integrated into the existing SCADA system to automatically direct flow between Cell 1A and Cell 2.

A new diesel suction pump station and intake structure will be installed at Cell 2 to pump flow back to the Peruque Creek Liftstation. The liftstation includes provisions for cell 2 to drain via the gravity sewer line if the diesel pump is inoperable. The liftstation includes a level sensor that will send level data to the existing SCADA system.

The existing overflow pipe between Cell 1B and Cell 1A will be removed and replaced with 26 lf of 18-inch ductile iron pipe.

The new construction will include significant modifications to the existing cell 2 berm and seal which will be reformed, compacted, and relined with a 12-inch clay liner within all disturbed areas of the cell. Additionally, all new lines through an earthen basin berm and/or seal include antiseep collars.

This construction permit includes an alternative design to the minimum design standard 10 CSR 20-8.130(4)(B)1. in accordance with 10 CSR 20-8.130(2) which allows the department to approve alternative designs to 10 CSR 20-8.130 with adequate engineering justification. The engineering justification, which certifies how the alternative design is as effective or more effective than the minimum design standards and how compliance with the minimum design standards is unfeasible or impractical, is included in appendix C. The alternative design was reviewed by DNR staff and determined to be as effective as the minimum design standards.

This construction permit includes an alternative design to the minimum design standard 10 CSR 20-8.200(5)(D)2. in accordance with 10 CSR 20-8.200(2), which allows the department to approve alternative designs to 10 CSR 20-8.200 with adequate engineering justification after public participation. The engineering justification, which certifies how the alternative design is as effective or more effective than the minimum design standards and how compliance with the minimum design standards is unfeasible or impractical, is included in appendix D. The alternative design was reviewed by DNR staff and determined to be as effective as the minimum design standards. This construction permit and alternative design was public noticed in accordance with 10 CSR 20-8.200(2) and 10 CSR 20-6.020 March 28, 2025, to April 28, 2025.

This project will also include general site work appropriate to the scope and purpose of the project and all necessary appurtenances to make a complete and usable wastewater treatment facility.

II. COST ANALYSIS FOR COMPLIANCE

Pursuant to Section 644.145, RSMo, when issuing permits under this chapter that incorporate a new requirement for discharges from publicly owned combined or separate sanitary or storm sewer systems or publicly owned treatment works, or when enforcing provisions of this chapter or the Federal Water Pollution Control Act, 33 U.S.C. 1251 et seq., pertaining to any portion of a publicly owned combined or separate sanitary or storm sewer system or [publicly owned] treatment works, the Department of Natural Resources shall make a "finding of affordability" on the costs to be incurred and the impact of any rate changes on ratepayers upon which to base such permits and decisions, to the extent allowable under this chapter and the Federal Water Pollution Control Act. This process is completed through a cost analysis for compliance. Permits that do not include new requirements may be deemed affordable.

The department is not required to determine Cost Analysis for Compliance because the permit contains no new conditions or requirements that convey a new cost to the facility.

III. CONSTRUCTION PERMIT CONDITIONS

The permittee is authorized to construct subject to the following conditions:

1. This construction permit does not authorize discharge.

2. All construction shall be consistent with plans and specifications signed and sealed by Allison Mannion, P.E., with Lochmueller Group and as described in this permit.

3. The department must be contacted in writing prior to making any changes to the plans and specifications that would directly or indirectly have an impact on the capacity, flow, system layout, or reliability of the proposed wastewater treatment facilities or any design parameter that is addressed by 10 CSR 20-8, in accordance with 10 CSR 20-8.110(11).

4. State and federal law does not permit bypassing of raw wastewater, therefore steps must be taken to ensure that raw wastewater does not discharge during construction. If a sanitary sewer overflow or bypass occurs, report the appropriate information to the department's Saint Louis Regional Office per 10 CSR 20-7.015(9)(G).

5. All construction must adhere to applicable 10 CSR 20-8 (Chapter 8) requirements listed below.

- Vacuum testing, if specified for concrete sewer manholes, shall conform to the test procedures in ASTM C1244 – 11(2017) *Standard Test Method for Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test Prior to Backfill*, as approved and published April 1, 2017, or the manufacturer's recommendation. 10 CSR 20-8.120(4)(F)1.

- Exfiltration testing, if specified for concrete sewer manholes, shall conform to the test procedures in ASTM C969 – 17 *Standard Practice for Infiltration and Exfiltration Acceptance Testing of Installed Precast Concrete Pipe Sewer Lines*, as approved and published April 1, 2017. 10 CSR 20-8.120(4)(F)2.

- Alternative Design. The department may approve an alternative design when it determines that the proposed alternative design is as effective or more effective than the requirements of this chapter and when compliance with the design requirements of this chapter would be unfeasible or impractical. The owner of a project proposing an alternative design must provide engineering justification to the department. The justification must – 10 CSR 20-8.130(2)
    - Be requested in writing; 10 CSR 20-8.130(2)A.
    - Be signed, sealed, and dated by a professional engineering licensed in Missouri 10 CSR 20-8.130(2)B.
    - Include an explanation of how compliance with a design requirement of this chapter is unfeasible or impractical; and 10 CSR 20-8.130(2)C.
    - Include all pertinent facts, data, reports, and studies certifying the proposed alternative design will result in equivalent or improved effectiveness compared ot the minimum design requirements in this chapter. 10 CSR 20-8.130(2)D.

- Alternative Design. The department may approve an alternative design, after public participation in accordance with 10 CSR 20-6.020 when it determines that the proposed alternative design is as effective or more effective than the requirements of this chapter and when compliance with the design requirements of this chapter would be unfeasible or impractical. The owner of a project proposing an alternative design must provide engineering justification to the department. The justification must – 10 CSR 20-8.200(2)
    - Be requested in writing; 10 CSR 20-8.200(2)A.
    - Be signed, sealed, and dated by a professional engineering licensed in Missouri 10 CSR 20-8.200(2)B.
    - Include an explanation of how compliance with a design requirement of this chapter is unfeasible or impractical; and 10 CSR 20-8.200(2)C.
    - Include all pertinent facts, data, reports, and studies certifying the proposed alternative design will result in equivalent or improved effectiveness compared to the minimum design requirements in this chapter. 10 CSR 20-8.200(2)D.

- Flood protection shall apply to new construction and to existing facilities undergoing major modification. The wastewater facility structures, electrical equipment, and mechanical equipment shall be protected from physical damage by not less than the 100-year flood elevation. 10 CSR 20-8.140(3)(B), 10 CSR 20-8.130(3)(A)

- Facilities shall be readily accessible by authorized personnel from a public right–of-way at all times. 10 CSR 20-8.140(2)(D), 10 CSR 20-8.130(3)(B)

- Adequate provisions shall be made to effectively protect facility personnel and visitors from hazards. The following shall be provided to fulfill the particular needs of each wastewater treatment facility: 10 CSR 20-8.130(3)(C)

- Fencing. Enclose the facility site with a fence designed to discourage the entrance of unauthorized persons and animals*;* 10 CSR 20-8.140(8)(A)
- Gratings over appropriate areas of treatment units where access for maintenance is necessary; 10 CSR 20-8.140(8)(B)
- First aid equipment; 10 CSR 20-8.140(8)(C)
- Posted "No Smoking" signs in hazardous areas; 10 CSR 20-8.140(8)(D)
- Appropriate personal protective equipment (PPE); 10 CSR 20-8.140(8)(E)
- Portable blower and hose sufficient to ventilate accessed confined spaces; 10 CSR 20-8.140(8)(F)
- 10 CSR 20-8.140(8)(G) Portable lighting equipment complying with NEC requirements. See subsection (7)(B) of this rule;
- 10 CSR 20-8.140(8)(H) Gas detectors listed and labeled for use in NEC Class I, Division 1, Group D locations. See subsection (7)(B) of this rule;
- Appropriately-placed warning signs for slippery areas, non-potable water fixtures (see subparagraph (7)(D)3.B. of this rule), low head clearance areas, open service manholes, hazardous chemical storage areas, flammable fuel storage areas, high noise areas, etc.; 10 CSR 20-8.140(8)(I)
- Explosion-proof electrical equipment, non-sparking tools, gas detectors, and similar devices, in work areas where hazardous conditions may exist, such as digester vaults and other locations where potentially explosive atmospheres of flammable gas or vapor with air may accumulate.; 10 CSR 20-8.140(8)(K)
- Provisions for local lockout/tagout on stop motor controls and other devices; 10 CSR 20-8.140(8)(L)
- Provisions for an arc flash hazard analysis and determination of the flash protection boundary distance and type of PPE to reduce exposure to major electrical hazards shall be in accordance with NFPA 70E *Standard for Electrical Safety in the Workplace* (2018 Edition), as approved and published August 21, 2017. 10 CSR 20-8.140(8)(M)

- The distance between wastewater pumping stations and all potable water sources shall be at least 50 feet in accordance with 10 CSR 23-3.010(1)(B). 10 CSR 20-8.130(3)(D)

- Multiple pumps shall be provided except for design average flows of less than 1,500 gallons per day (MGD). 10 CSR 20-8.130(3)(B) 1.
    - Engineering justification was provided by Allison Mannion, P.E., with Lochmueller Group certifying an alternative design to this requirement is as effective or more effective than this requirement. The proposed design with a single pump, has the ability to flow by gravity without use of the pump before a bypass would occur. The single pump is to only fully empty the basin, which is not a time sensitive activity. See appendix C.

- Electrical equipment. Electrical equipment shall be provided with the following requirements:
    - 10 CSR 20-8.130(4)(B)2.A. Electrical equipment must comply with 10 CSR 20-8.140(7)(B);

  - Utilize corrosive resistant equipment located in the wet well; 10 CSR 20-8.130(4)(B)2.B.
  - Provide a watertight seal and separate strain relief for all flexible cable; 10 CSR 20-8.130(4)(B)2.C.
  - Install a fused disconnect switch located above ground for the main power feed for all pumping stations. 10 CSR 20-8.130(4)(B)2.D.
  - Install lightning and surge protection systems; 10 CSR 20-8.130(4)(B)2.F.
  - Install a one hundred ten volt (110 V) power receptacle inside the control panel located outdoors to facilitate maintenance; 10 CSR 20-8.130(4)(B)2.G.
  - Provide Ground Fault Circuit Interruption (GFCI) protection for all outdoor receptacles. 10 CSR 20-8.130(4)(B)2.H.

- Water level controls must be accessible without entering the wet well. 10 CSR 20-8.130(4)(C)

- Valves shall not be located in the wet well unless integral to a pump or its housing. 10 CSR 20-8.130(4)(D)

- Covered wet wells shall have provisions for air displacement to the atmosphere, such as an inverted and screened "j" tube or other means. 10 CSR 20-8.130(4)(E)

- Self-Priming Pumps. The combined total of dynamic suction lift at the "pump off" elevation and required net positive suction head at design operating conditions shall not exceed 22 feet. 10 CSR 20-8.130(5)(A)

- Wet well access shall not be through the equipment compartment. 10 CSR 20-8.130(5)(C)

- Alarm systems with an uninterrupted power source shall be provided for pumping stations. 10 CSR 20-8.130(7)

- Emergency Operation. Pumping stations shall be capable of operating during emergencies to prevent the discharge of raw wastewater. In addition to the required emergency means of operation and a storage/detention basin or tank, at least one of the following shall be provided: 10 CSR 20-8.130(8)
  - For a pump station serving a wastewater treatment facility with a design average flow of 100,000 gpd, a storage capacity for 4- hour retention of the peak hourly flow. 10 CSR 20-8.130(8)(B)

- Lagoon berms shall be constructed of relatively impervious material and compacted to at least 95 percent maximum dry density test method to form a stable structure. 10 CSR 20-8.200(5)(A)1.

- The minimum berm width shall be eight feet to permit access of maintenance vehicles. 10 CSR 20-8.200(5)(A)2.

- The soil of the lagoon bottom shall be compacted with the moisture content between 2 percent below and 4 percent above the optimum water content and compacted to at least 95 percent maximum dry density test method. 10 CSR 20-8.200(5)(B)

- The lagoon shall be sealed to ensure that seepage loss is as low as possible and has a design permeability not exceeding 1.0 x 10-7 cm/sec. 10 CSR 20-8.200(5)(C)1.

- The minimum thickness of the compacted clay liner must be 12 inches. For permeability coefficients greater than 1.0 × 10-7 cm/sec or for heads over 5 feet such as an aerated lagoon system, the following formula shall be used to determine minimum seal thickness, Equation 200-1 per 10 CSR 20-8.200(5)(C)2.:

  Equation 200-1

  $$t = \frac{H \times K}{5.4 \times 10^{-7\ cm/sec}}$$

  where:
  K = the permeability coefficient of the soil in question;
  H = the head of water in the lagoon; and
  t = the thickness of the soil seal.

- Synthetic seals thickness may vary due to liner material, but the liner thickness shall be no less than .02 inch or 20 mil and be the appropriate material to perform under existing conditions. 10 CSR 20-8.200(5)(C)3.

- Seep collars shall be provided on drainpipes where they pass through the lagoon seal. 10 CSR 20-8.200(5)(C)4.

- Unlined corrugated metal pipe shall not be used for influent lines due to corrosion problems. 10 CSR 20-8.200(5)(D)1.

- A manhole shall be installed with its invert at least six inches above the maximum operating level of the lagoon, prior to the entrance into the primary cell, and provide sufficient hydraulic head without surcharging the manhole. 10 CSR 20-8.200(5)(D)2.
  - Engineering justification was provided by Allison Mannion, P.E., with Lochmueller Group certifying an alternative design to this requirement is as effective or more effective than this requirement. The proposed design uses a force main with a check valve at the end of the line to prevent draining of the basin back to the lift station or in the event of a broken line. See appendix D.

- The influent line(s) shall be located along the bottom of the lagoon so that the top of the pipe is just below the average elevation of the lagoon seal; however, there shall be an adequate seal below the pipe. 10 CSR 20-8.200(5)(D)3.

6. Upon completion of construction:

   A. The City of O'Fallon will become the continuing authority for operation and maintenance of these facilities;

B. Submit an electronic copy of the as builts if the project was not constructed in accordance with previously submitted plans and specifications; and

C. Submit the Statement of Work Completed form to the department in accordance with 10 CSR 20-6.010(5)(N) (https://dnr.mo.gov/document-search/wastewater-construction-statement-work-completed-mo-780-2155)

IV. REVIEW SUMMARY

1. CONSTRUCTION PURPOSE

The purpose of this project is to reconfigure the existing equalization basins for additional storage capacity at the Peruque Creek Lift Station during wet weather flows. This project will divert flow from one existing equalization basin (Cell 1A) to a second existing equalization basin (Cell 2). During previous wet weather events the City of O'Fallon has experienced sanitary sewer overflows (SSOs) at manholes between the Peruque Creek Lift Station and the O'Fallon Wastewater Treatment Plant after Cell 1A reached capacity and all flow must be pumped to the wastewater treatment facility. This project aims to eliminate SSOs during future wet weather events. It is estimated the equalization basins are used to store flow approximately 10 times per year.

2. FACILITY DESCRIPTION

The Peruque Creek Lift Station is located at an old wastewater treatment facility, which was regionalized to the O'Fallon Wastewater Treatment Plant. The lift station is connected to a SCADA system allowing for remote operation and usage of the earthen basin, Cell 1A is used for flow equalization during wet weather events. Cell 1A has a capacity of 4.5 million gallons (MG) and is connected to the lift station by a 14-inch influent forcemain and a 12-inch gravity drain line. Cell 1A has a synthetic liner and has an overflow pipe into Cell 1B. Cell 1B has a capacity of 3.8 MG but does not have any other connections and must be manually pumped back into Cell 1A if the overflow pipe is used. Cell 1A has a manhole with a 5.7 ft weir and level sensors connected to the facilities SCADA system.

Earthen basin, Cell 2 has a capacity of 13.8 MG and has an 8-inch gravity drain line to the lift station. The existing 8-inch drain line is not of sufficient depth to adequately drain Cell 2. This Cell 2 was previously used for sludge storage, but the sludge has been removed and the basin is no longer used for sludge storage.

The other existing earthen basins, Cell 1C and Cell 1D, are not currently in use, and the city is filling these cells with clean fill.

The Peruque Creek Lift Station is located at 1600 Progress West, O'Fallon, in St. Charles County, Missouri. The O'Fallon Wastewater Treatment Plant is located at 150 Firma Road, O'Fallon, in St. Charles County, Missouri. The facility has a design average flow of 11.25 MGD and serves a population equivalent of approximately 93,000 people.

3. REVIEW of MAJOR TREATMENT DESIGN CRITERIA

Existing major components that will remain in use include the following:

- Earthen Basin, Cell 1A is a non-aerated cell, has a surface area of 1.5 acres, and has an operating volume of 4.5 MG. This cell has 2 ft of freeboard, 13 ft of operating depth, and a synthetic liner. This cell provides additional flow equalization during wet weather event at the Peruque Creek Lift Station when the O'Fallon Wastewater Treatment Plant is unable to treat all flows from the collection system.

- Earthen Basin, Cell 1B is a non-aerated cell, has a surface area of 1.65 acres, and has an operating volume of 3.8 MG. This cell has 2 ft of freeboard, 8 ft of operating depth, and clay liner. This cell does not normally receive wastewater unless Cell 1A is filled and wastewater flows through the overflow pipe to Cell 1B. In the event Cell 1B receives wastewater, it must be pumped into Cell 1A with a portable pump. An overflow between Cell 1A and Cell 1B will remain following construction, but the additional capacity of Cell 1B should not be necessary.

- Earthen Basins, Cell 1C and Cell 1D are not currently in use, do not receive any wastewater, and are currently planned to be filled with clean fill in the future.

- Earthen Basin, Cell 2 is non-aerated cell, has a surface area of 6 acres, and has an operating volume of 13.8 million gallons. This cell has 2 ft of freeboard, 10 ft of operating depth, and a clay liner. This cell currently only has a gravity drain line to the lift station to drain rainwater. Following this project, this cell will provide additional flow equalization during wet weather events at the Peruque Creek Lift Station when the O'Fallon Wastewater Treatment Plant is unable to treat all flows from the collection system and Cell 1A is filled.

- The Peruque Creek Lift Station includes 47 hp pumps capable of pumping 2,400 gpm at 49 feet of TDH through the proposed 14-inch force main into Cell 2.

Construction will cover the following items:

- Wet Weather Flow Equalization – Wet weather flow equalization is utilized during wet weather events where the peak flow is greater than the design peak capacity of the treatment facility. Excess flow is stored in the Peruque Creek Lift

Station Cells 1A and 2. Once the wet weather event subsides, the flow stored in Cells 1A and 2 are returned to the pump station and sent through the collection system to the treatment facility for full treatment.

- Cell 2: To send flow from the Peruque Creek Lift Station to Cell 2, approximately 1,400 lf of 14-inch restrained joint C900 force main will be constructed from a tee on the existing Peruque Creek Lift Station discharge line to the Cell 2. Two new actuated 14-inch plug valves will be installed, on this existing discharge line to Cell 1A and on the new 14-inch discharge line to Cell 2. These plug valves will be connected to the facility's SCADA system so flow can be easily directed to either Cell 1A or Cell 2.

  To return flow from Cell 2 back to the Peruque Creek Lift Station, a manhole will be constructed along with a diesel suction pump station. The new pump station manhole will have level sensor connected to the facility's SCADA system and a 4-inch inverted and screened J-Tube. The pump station will have the capability to pump 500 gpm with 24 ft of TDH. A new precast concrete intake structure with an anti-seep collar will be constructed through the seal of Cell 2 to the new manhole. A 4-inch ductile iron pipe (DIP) from the manhole to the diesel pump will be the suction line. The pump will discharge to a four-inch DIP, which flows to a new eight-inch DIP. The eight inch DIP line will connect to the existing 8-inch gravity line back to the Peruque Creek Lift Station and the new manhole. An eight-inch plug valve will be installed on the eight-inch DIP line between the 4-inch DIP discharge connection and manhole so the lagoon can gravity drain back to the lift station if the diesel suction pump is not functional.

  The specifications and plans require a minimum 12-inch thick clay soil liner with a maximum permeability of 10^{-7} cm/sec below the new structure intake structure pipe and for relining all disturbed areas within Cell 2.

- Cell 1A/1B: The existing overflow pipe between Cell 1A and Cell 1B will be replaced with 26 lf of 18-inch DIP. Anti-seep collars will be installed on the overflow pipe.

  The specifications and plans require a minimum 12 inch thick clay soil liner with a maximum permeability of 10^{-7} cm/sec for relining the disturbed areas within Cell 1B. Additionally, the synthetic liner of 1A will be replaced and repaired following replacement of the overflow pipe.

4. OPERATING PERMIT

These construction activities do not change the effluent limits or conditions of the current operating permit. No changes to the operating permit are necessary upon receipt of the Statement of Work Completed form.

V. NOTICE OF RIGHT TO APPEAL

If you were adversely affected by this decision, you may be entitled to an appeal before the Administrative Hearing Commission (AHC) pursuant to Section 621.250 RSMo. To appeal, you must file a petition with the AHC within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed; if it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC. Any appeal should be directed to:

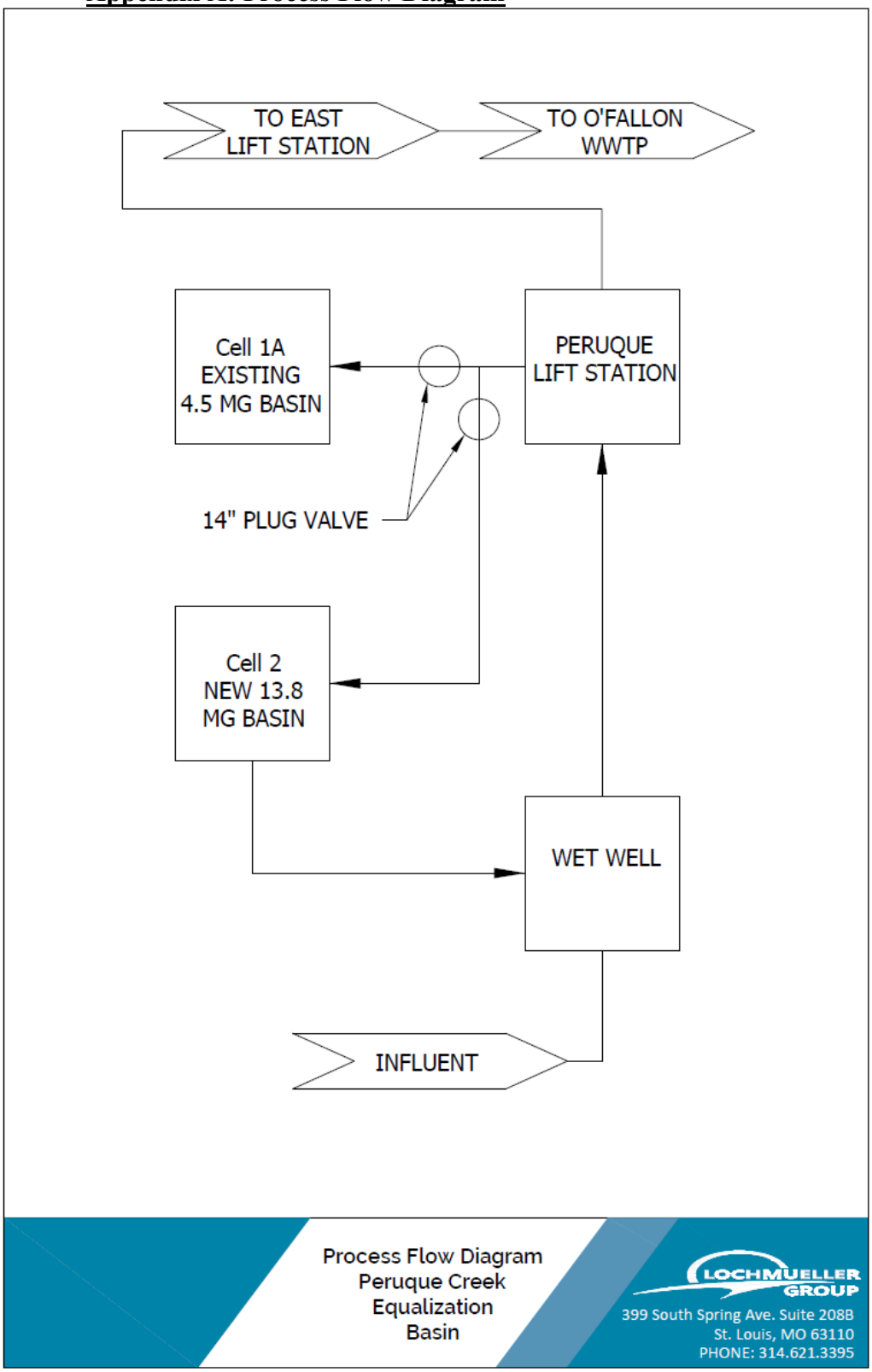
Administrative Hearing Commission
U.S. Post Office Building, Third Floor
131 West High Street, P.O. Box 1557
Jefferson City, MO 65102-1557
Phone: 573-751-2422
Fax: 573-751-5018
Website: https://ahc.mo.gov

Andrew Sell
Engineering Section
andrew.sell@dnr.mo.gov

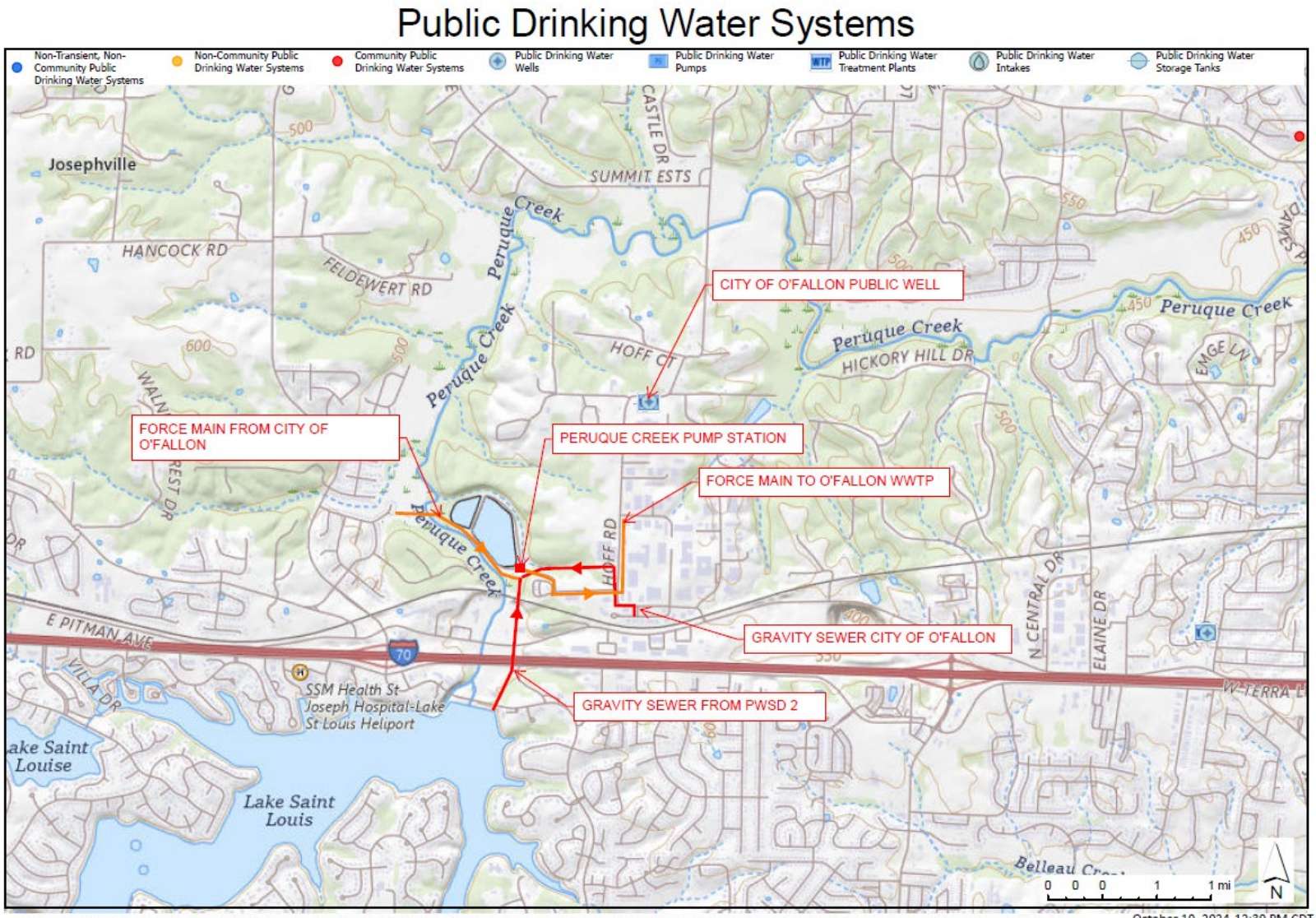
Chia-Wei Young, P.E.
Engineering Section
chia-wei.young@dnr.mo.gov

APPENDICES

- **Appendix A: Process Flow Diagram**



- **Appendix B: Collection System Diagram and Drinking Water Systems**



- **Appendix C: 8.130 Alternative Design Justification**

LOCHMUELLER GROUP

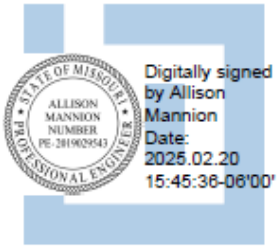
MEMO

To: Andrew Sell
Missouri Department of Natural Resources,
Water Protection Program

From: Allison Mannion, PE

Date: February 20, 2025

Subject: Duplex Pump Alternative Design Justification



The Peruque Creek Lift Station Improvements project pumps excess flow from the Peruque Creek Lift Station out to an earthen basin "Cell 2" to temporarily store the wastewater in a high flow event. There is an existing gravity sewer which is designed to drain Cell 2, however the invert of this gravity sewer is too high to fully drain the basin. The invert of the gravity sewer is 476.73 feet. The bottom of the basin is 472 feet. The basin can drain by gravity sewer until it is below the invert of the gravity sewer. At this point, a pump will be required to continue to drain the basin.

10 CSR 20-8.130 Pumping Stations requires duplex pumps where the design flow is 1,500 gallons per day or greater, which is the case for this pump station. However, in this case, only one pump should be required.

This facility is designed to only be needed a few times per year, as needed for high flow events in the system when it becomes overwhelmed. When Cell 2 needs to be drained following an event where storage is required, the basin can be drained by gravity to 476.73 feet using the existing gravity sewer. The addition of the pump station is to be able to continue to drain Cell 2 down to 474 feet.

The cost of a duplex pump in this situation is impractical for the City of O'Fallon due to the option to drain this basin by gravity flow.

399 South Spring Ave, Suite 208 B
St. Louis, Missouri 63110
PHONE: 314.621.3395

- **Appendix D: 8.200 Alternative Design Justification**

LOCHMUELLER GROUP

MEMO

To: Andrew Sell
Missouri Department of Natural Resources,
Water Protection Program

From: Allison Mannion, PE

Date: March 6, 2025

Subject: Alternative Design Justification for 10 CSR 20-8.200(5)(D)2

STATE OF MISSOURI
ALLISON MANNION
NUMBER PE-2019029543
PROFESSIONAL ENGINEER

Digitally signed by Allison Mannion
Date: 2025.03.06 15:50:54-06'00'

The Peruque Creek Lift Station Improvements Project is designed to modify an existing earthen basin that is currently unused, to store wastewater during a high flow event in the wastewater system. This will help to prevent sanitary sewer overflows at a lift station downstream in the system. The design proposes the influent 14-inch force main to discharge directly into the earthen wastewater storage basin. Per 10 CSR 20-8.200(5)(D)2. a manhole shall be installed with its invert at least six inches above the maximum operating level of the lagoon or earthen basin, prior to the entrance into the primary cell, to provide sufficient hydraulic head without surcharging the manhole.

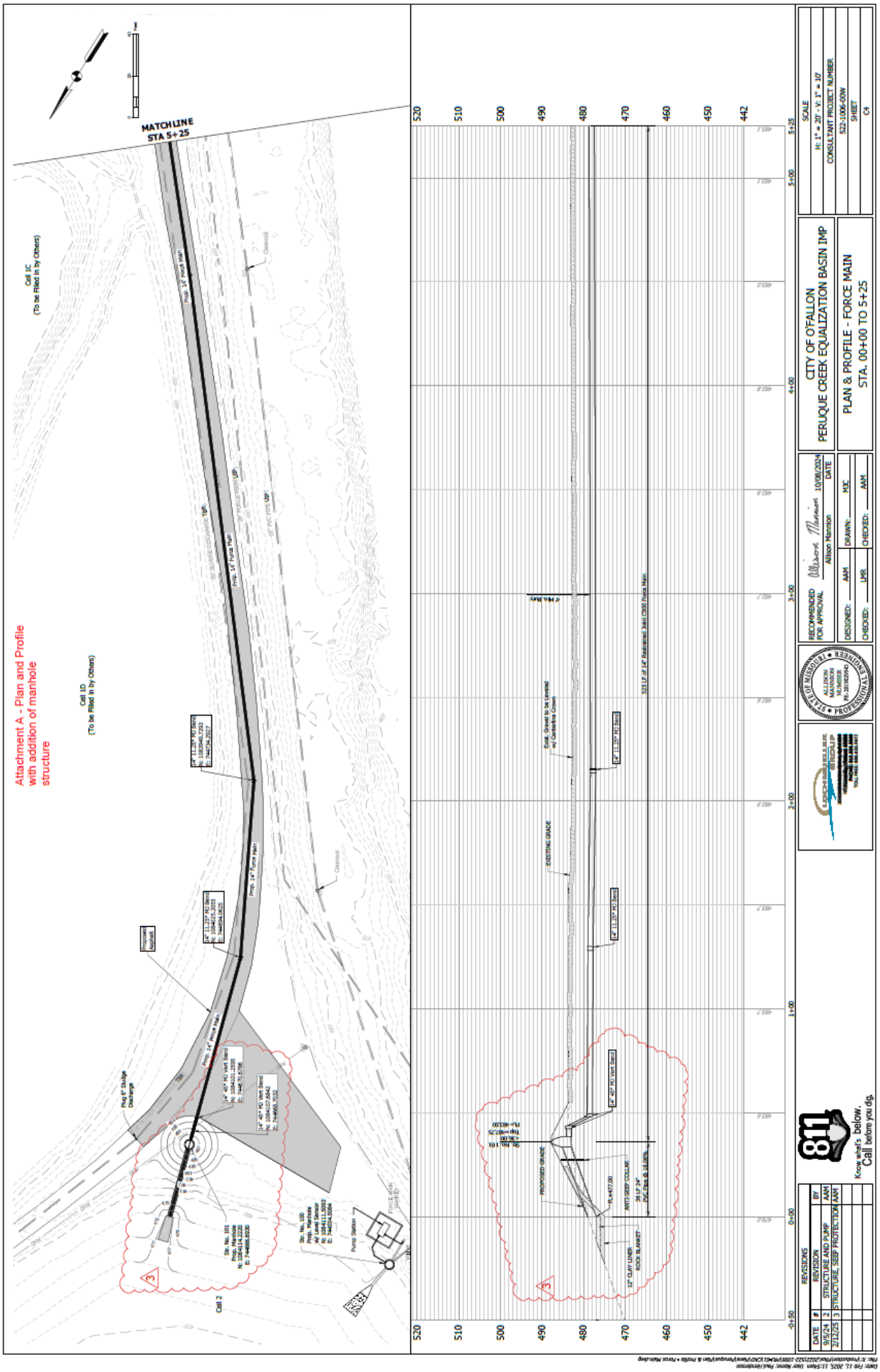
The addition of a manhole in this instance is not practical. This design modifies an existing earthen basin. For a manhole to be added that meets these requirements, either the manhole would need to be 1.5 feet deep to meet the 6 inches above the maximum water level, or the earth around the manhole would need to be built up to form a mound. This is illustrated on Sheet C3 in the plans included in the submittal.

To prevent backflow, an in-line check valve will be installed near the outlet of the pipe. If a break in the pipe were to occur, this check valve would prevent the water from flowing back into the pipe and draining the basin. The check valve can be seen in the plan and profile on sheet C4.

Additionally, there are check valves at the lift station to prevent backflow into the lift station. The wastewater flow out to the two storage basins is controlled by two 14-inch electrically actuated plug valves controlled by SCADA. The plug valves and check valves will both prevent any backflow from going back into the lift station. They will also help to break the suction of the pipe.

A full site plan can be seen in this submittal indicating the force main, check valve, lift station, earthen basin and plug valve location.

399 South Spring Ave, Suite 208 B
St. Louis, Missouri 63110
PHONE: 314.621.3395


Attachment A - Plan and Profile with addition of manhole structure
MATCHLINE STA 5+25
Cell 1C (To be Filled in by Others)
Cell 1D (To be Filled in by Others)
Cell 2
Prop. 14" Force Main
Prop. 8" Sludge Discharge
Pump Station
CITY OF O'FALLON
PERUQUE CREEK EQUALIZATION BASIN IMP
PLAN & PROFILE - FORCE MAIN
STA. 00+00 TO 5+25
CONSULTANT PROJECT NUMBER
522-1006-00W
SHEET
C4
REVISIONS
DATE
BY
STRUCTURE AND PUMP
STRUCTURE, SEEP PROTECTION
Know what's below.
Call before you dig.