Permit No. CP0001771

STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION

CONSTRUCTION PERMIT

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

Legacy Healthcare of Festus
12827 State Road TT
Festus, MO 63028

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.

December 29, 2015
Effective Date

Sara Parker Pauley
Sara Parker Pauley, Director, Department of Natural Resources

December 28, 2017
Expiration Date

John Madras
John Madras, Director, Water Protection Program

CONSTRUCTION PERMIT

I. CONSTRUCTION DESCRIPTION

This is a DEMONSTRATION project and additional monitoring requirements are included in the operating permit in accordance with the draft Approval Process for Innovative Technology Factsheet. The upgrade will be a demonstration project for the patented Severn Trent Amphidrome Reactor™ System. The new wastewater treatment plant will include an Anoxic Equalization tank, the Amphidrome Reactor, chemical feed pump for the addition of alkalinity, UV disinfection system, and blowers. The existing lagoon will be removed following construction of the new treatment plant. The design flow is 8,100 gpd.

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 complete a cost analysis for compliance because the facility is not a combined or separate sanitary sewer system for a publically-owned treatment works.

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 in accordance with the plans and specifications submitted by Cole & Associates Inc. on July 20, 2015.

3. The department must be contacted in writing prior to making any changes to the approved 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(8).

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 St. Louis Regional Office per 10 CSR 20-7.015(9)(E)2.

5. This construction permit is invalid for projects required to comply with the requirements contained in 10 CSR 20-4, "Grants and Loans"

6. Protection of drinking water supplies shall be in accordance with 10 CSR 20-8.120(10). "There shall be no physical connections between a public or private potable water supply system and a sewer, or appurtenance thereto which would permit the passage of any wastewater or polluted water into the potable supply. No water pipe shall pass through or come in contact with any part of a sewer manhole."

7. Sewers in relation to water works structures shall meet the requirements of 10 CSR 23-3.010 with respect to minimum distances from public water supply wells or other water supply sources and structures.

   A. Sewer mains shall be laid at least 10-feet horizontally from any existing or proposed water main. The distances shall be measured edge-to-edge. In cases where it is not practical to maintain a 10-foot separation, the department may allow a deviation on a case-by-case basis, if supported by data from the design engineer. Such a deviation may allow installation of the sewer closer to a water main, provided that the water main is in a separate trench or on an undisturbed earth shelf located on either side of the sewer and at an elevation so the bottom of the water main is at least 18-inches above the top of the sewer. If it is impossible to obtain proper horizontal and vertical separation as described above for sewers, the sewer must be constructed of slip-on or mechanical joint pipe or continuously encased and be pressure tested to 150 pounds per square inch to assure water tightness.

   B. Manholes should be located at least 10-feet horizontally from any existing or proposed water main.

   C. Manholes shall be located with the top access at or above grade level.

   D. Sewers crossing water mains shall be laid to provide a minimum vertical distance of 18-inches between the outside of the water main and the outside of the sewer. This shall be the case where the water main is either above or below the sewer. The crossing shall be arranged so that the sewer joints will be equidistant and as far as possible from the water main joints. Where a water main crosses under a sewer, adequate structural support shall be provided for the sewer to maintain line and grade. When it is impossible to obtain proper vertical separation as stipulated above, one of the following methods must be specified:

      a. The sewer shall be designed and constructed equal to the water pipe and shall be pressure tested to assure water tightness prior to backfilling; or

      b. Either the water main or sewer line may be continuously encased or enclosed in a watertight carrier pipe which extends 10-feet on both sides of the crossing, measured perpendicular to the water main. The carrier pipe shall be of materials approved by the department for use in water main construction.

8. In addition to the requirements for a construction permit, 10 CSR 20-6.200 requires land disturbance activities of one acre or more to obtain a Missouri state operating permit to discharge stormwater. The permit requires best management practices sufficient to control runoff and sedimentation to protect waters of the state. Land disturbance permits will only be obtained by means of the department's ePermitting system available online at www.dnr.mo.gov/env/wpp/epermit/help.htm. See www.dnr.mo.gov/env/wpp/stormwater/sw-land-disturb-permits.htm for more information.

9. A United States (U.S.) Army Corps of Engineers (COE) permit (404) and a Water Quality Certification (401) issued by the department or permit waiver may be required for the activities described in this permit. This permit is not valid until these requirements are satisfied. If construction activity will disturb any land below the ordinary high water mark of jurisdictional waters of the U.S. then a 404/401 will be required. Since the COE makes determinations on what is jurisdictional, you must contact the COE to determine permitting requirements. You may call the department's Water Protection Program at 573-751-1300 for more information. See www.dnr.mo.gov/env/wpp/401/ for more information.

10. A full closure plan shall be submitted to the department's St. Louis Regional Office for review and approval of any permitted wastewater treatment system being replaced. In accordance with 10 CSR 20-6.010(12), the closure plan must meet the requirements outlined in Standard Conditions Part III of the Missouri State Operating Permit No. MO- 0093653. Closure shall not commence until the submitted closure plan is approved by the department. Form J – Request for Termination of a State Operating Permit, shall be submitted to the Water Protection Program for termination of any existing Missouri state operating permit, once closure is completed in accordance with the approved closure plan.

11. Upon completion of construction;

    A. Affinity Healthcare Ventures LLC will become the continuing authority for operation, maintenance, and modernization of these facilities;

    B. Submit the enclosed form Statement of Work Completed to the department in accordance with 10 CSR 20-6.010(5)(D); and

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

IV. REVIEW SUMMARY

1. AMMONIA

The Water Protection Program is providing this notice to inform permittees that EPA's published ammonia criteria for aquatic life protection is lower than the current Missouri criteria. The department has initiated stakeholder discussions on this topic and at this time, there is no firm target date for starting the rulemaking to adopt new standards. More information can be found at http://dnr.mo.gov/pubs/pub2481.htm.

The facility received an ammonia letter on October 23, 2013. The facility revised the previously submitted antidegradation and construction permit to meet the expected effluent limits. The permit renewal issued February 1, 2014, along with the public noticed 2015 modification additionally discussed the 2013 EPA ammonia.

2. CONSTRUCTION PURPOSE

The upgrade and expansion will be a demonstration project of the Severn Trent Amphidrome Reactor™. The upgrade is to achieve facility compliance as the facility is currently in Enforcement. The upgrade and expansion is to meet Ammonia and *E. Coli* effluent limits.

3. FACILITY DESCRIPTION

The existing facility is a fifty plus year lagoon with no disinfection and not designed to meet 10 CSR 20-8 Design Guides or Ammonia effluent limits. The permit was renewed February 1, 2014 with a schedule of compliance to meet Ammonia effluent limits by February 1, 2018. The facility has reported 6 BOD exceedances and 3 TSS exceedances since 2012. The facility is currently under an Abatement Order of Consent to upgrade and be in compliance. This upgrade and expansion will replace the lagoon system; install a mechanical treatment plant with disinfection to meet effluent limits. The upgrade also includes a slight expansion to 8,100 gallons per day.

4. COMPLIANCE PARAMETERS

The construction is to meet more protective effluent limits. As this is a demonstration project, for the first year of operation following construction, additional monitoring will be required. The following effluent limits were determined through the Antidegradation Review completed in November 2014.

Parameter	Units	Monthly average limit
Biochemical Oxygen Demand$_5$	mg/L	20
Total Suspended Solids	mg/L	20
Ammonia as N-summer	mg/L	1.4
Ammonia as N-winter	mg/L	2.8
pH	SU	6.5-9.0
E. Coli	#/100mL	206

5. REVIEW of MAJOR TREATMENT DESIGN CRITERIA

The current design guides, 10 CSR 20-8 do not contain design parameters for the Amphidrome Reactor™ technology. As a demonstration project, the data gathered with the operating permit will be used to help develop design criteria for future projects. Amphidrome systems have been evaluated in other states, including Maryland, Pennsylvania, and Minnesota.

The Amphidrome system utilizes two tanks and one submerged attached growth bioreactor, called Amphidrome reactor. The first tank, the anoxic/equalization tank, is where the raw wastewater enters the system. The tank has a 8,000 gallon tank capacity, with an equalization section, a settling zone, and a sludge storage section. It serves as a primary clarifier before the Amphidrome reactor.

The Amphidrome Reactor receives water from the equalization tank. The reactor consists of an underdrain system, support gravel and filter media. Aeration is provided on an intermittent basis for the removal of organics and nitrogen. The Kaeser Compack blower units model BB52C will be used in the Amphidrome process and in the backwash air. Each blower is rated at 90 cfm at 9psi.

To meet Ammonia effluent limits, a chemical feed pump for alkalinity will be constructed. In the testing of the system, supplemental alkalinity is added to maintain the pH around 8 to ensure nitrification. The feed pumps for addition of alkalinity are located in the control panel area and is piped to the Amphidrome Reactor. Based on the calculations, 101 mg/L $CaCO_3$ supplemental alkalinity will be required.

The Amphidrome pumps are supplied with the reactor and will be submersible, centrifugal with a capacity of 70 gpm at 7 ft TDH per pump. The backwash pumps will also be supplied with the reactor and will be submersible, centrifugal, with a capacity of 108 gpm at 20 ft TDH per pump.

The installation of ultraviolet disinfection is for compliance with the *E. Coli* bacteria effluent limits. The UV system shall be designed to treat a peak daily flow of 25,000 gpd, which is a 3:1 peaking factor from the design flow of 8,100 gpd. The system is designed to treat flows at a minimum transmittance of 60%. The UV system is designed for a BOD influent of 30 mg/L and a TSS influent of 25 mg/L. There will be eight lamps in the system. The UV system will be provided by Enaqua or equivalent.

Along with the pump station, approximately 51 linear feet of 8 inch ductile iron pipe and 25 linear feet of 2-inch PVC SDR-21 forcemain will be installed and all necessary appurtenances to make a complete and usable wastewater treatment plant.

6. OPERATING PERMIT MODIFICATION

Operating permit MO-0093653 will require a modification to reflect the construction activities. Upon completion of construction submit a Statement of Work Completed. The draft operating permit was public noticed November 13-December 14, 2015. No comments were received. The closure plan for the existing lagoon has been submitted to the department and is under review by the St. Louis Regional Office. The facility has already paid for the operating permit modification. The modification and upgrades to the treatment plant removes the schedule of compliance from the operating permit.

MO 0093653 CP0001771
AP21636 C14481

RECEIVED
JUL 20 2015
Water Protection Program

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM

APPLICATION FOR CONSTRUCTION PERMIT – WASTEWATER TREATMENT FACILITY

1 of 2
$1,000 of $1395.00

FOR DEPARTMENT USE ONLY	
APP NO.	CP NO.
FEE RECEIVED $1000.00	CHECK NO. 1393
DATE RECEIVED 7-20-15 T.B.	

APPLICATION OVERVIEW

The Application for Construction Permit – Wastewater Treatment Facility form has been developed in a modular format and consists of Part A and B. **All applicants must complete Part A.** Part B should be completed for applicants who currently land-apply wastewater or propose land application for wastewater treatment. **Please read the accompanying instructions before completing this form. Submittal of an incomplete application may result in the application being returned.**

PART A – BASIC INFORMATION

1.0 APPLICATION INFORMATION (Note – If any of the questions in this section are answered NO, this application may be considered incomplete and returned.)

1.1 Is this a Federal/State funded project? ☐ YES ☑ N/A Funding Agency: _____ Project #: _____

1.2 Has the Missouri Department of Natural Resources approved the proposed project's antidegradation review?
☑ YES Date of Approval: 03/15

1.3 Has the department approved the proposed project's facility plan*?
☑ YES Date of Approval: _____ ☐ NO ☐ N/A (If Not Applicable, complete No. 1.4.)

1.4 [Complete only if answered Not Applicable on No. 1.3.] Is a copy of the engineering report* for wastewater treatment facilities with a design flow less than 22,500 gpd included with this application?
☐ YES ☐ NO

1.5 Is a copy of the appropriate plans* and specifications* included with this application?
☑ YES Denote which form is submitted: ☐ Hard copy ☑ Electronic copy (See instructions.) ☐ NO

1.6 Is a summary of design* included with this application? ☑ YES ☐ NO

1.7 Has the appropriate operating permit application (A, B, or B2) been submitted to the department?
☐ YES Date of submittal: _____
☑ Enclosed is the appropriate operating permit application submittal. Denote which form: ☐ A ☑ B ☐ B2
☐ N/A Please explain: _____

1.8 Is the facility currently under enforcement with the department or the Environmental Protection Agency? ☐ YES ☑ NO

1.9 Is the appropriate fee included with this application? ☑ YES ☐ NO (See instructions for appropriate fee.)

* Must be affixed with a Missouri registered professional engineer's seal, signature and date.

2.0 PROJECT INFORMATION

2.1 NAME OF PROJECT

Legacy Healthcare of Festus

2.2 PROJECT DESCRIPTION

Closure of existing 2-cell lagoon and construction of Severn Trent Amphidrome package wastewater treatment plan.

2.3 SLUDGE HANDLING, USE AND DISPOSAL DESCRIPTION

Sludge will be pumped and disposed of per MoDNR and EPA standards

2.4 DESIGN INFORMATION

A. Current population: 78; Design population: 81

B. Actual Flow: 4830 gpd; Design Average Flow: 8100 gpd;
Actual Peak Daily Flow: _____ gpd; Design Maximum Daily Flow: _____ gpd; Design Wet Weather Event: _____

2.5 ADDITIONAL INFORMATION

A. Is a topographic map attached? ☑ YES ☐ NO

B. Is a process flow diagram attached? ☑ YES ☐ NO

3.0 WASTEWATER TREATMENT FACILITY

NAME	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
Legacy Healthcare of Festus	(636)536-5365	JSells@AHCVLLC.COM

ADDRESS (PHYSICAL)	CITY	STATE	ZIP CODE	COUNTY
12827 State Road TT	Festus	MO	63028	Jefferson

Wastewater Treatment Facility: Mo- (Outfall 1 Of 1)

3.1 Legal Description: SE ¼, NE ¼, ____ ¼, Sec. 4, T 39, R 6e
(Use additional pages if construction of more than one outfall is proposed.)

3.2 UTM Coordinates Easting (X): 731285 Northing (Y): 4224273
For Universal Transverse Mercator (UTM), Zone 15 North referenced to North American Datum 1983 (NAD83)

3.3 Name of receiving streams: Hocum Ho[redacted]

4.0 PROJECT OWNER

NAME	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
Affinity Healthcare Ventures, LLC	(636) 536-5365	JSells@AHCVLLC.COM

ADDRESS	CITY	STATE	ZIP CODE
17826 Edison Ave	Chesterfield	MO	63005

5.0 CONTINUING AUTHORITY: Permanent organization that will serve as the continuing authority for the operation, maintenance and modernization of the wastewater collection system.

NAME	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
Affinity Healthcare Ventures, LLC	(636) 536-5365	JSells@AHCVLLC.COM

ADDRESS	CITY	STATE	ZIP CODE
17826 Edison Ave	Chesterfield	MO	63005

5.1 A letter from the continuing authority, if different than the owner, is included with this application. ☐ YES ☐ NO ☑ N/A

5.2 COMPLETE THE FOLLOWING IF THE CONTINUING AUTHORITY IS A MISSOURI PUBLIC SERVICE COMMISSION REGULATED ENTITY.

A. Is a copy of the certificate of convenience and necessity included with this application? ☐ YES ☐ NO

5.3 COMPLETE THE FOLLOWING IF THE CONTINUING AUTHORITY IS A PROPERTY OWNERS ASSOCIATION.

A. Is a copy of the as-filed restrictions and covenants included with this application? ☐ YES ☐ NO

B. Is a copy of the as-filed warranty deed, quitclaim deed or other legal instrument which transfers ownership of the land for the wastewater treatment facility to the association included with this application? ☐ YES ☐ NO

C. Is a copy of the as-filed legal instrument (typically the plat) that provides the association with valid easements for all sewers included with this application? ☐ YES ☐ NO

D. Is a copy of the Missouri Secretary of State's nonprofit corporation certificate included with this application? ☐ YES ☐ NO

6.0 ENGINEER

ENGINEER NAME / COMPANY NAME	TELEPHONE NUMBER WITH AREA CODE	E-MAIL ADDRESS
Cole & Associates, Inc.	(314) 984-9887	rsalamie@colestl.com

ADDRESS	CITY	STATE	ZIP CODE
401 S. 18th Street, Suite 200	St. Louis	MO	63103

7.0 PROJECT OWNER: I hereby certify that I am familiar with the information contained in this application and to the best of my knowledge and belief such information is true, complete, and accurate, and if granted this permit, I agree to abide by the Missouri Clean Water Law and all rules, regulations, orders, and decisions, subject to any legitimate appeal available to applicant under Missouri Clean Water Law. I also understand the issuance of the construction permit does not guarantee the proposed wastewater treatment will meet the required effluent limitations of the issued Missouri State Operating Permit for this facility.

PROJECT OWNER SIGNATURE		
PRINTED NAME: John M Sells		DATE: 7/9/15
TITLE OR CORPORATE POSITION: President	TELEPHONE NUMBER WITH AREA CODE: 636-449-1295	E-MAIL ADDRESS

Mail completed copy to:

MISSOURI DEPARTMENT OF NATURAL RESOURCES
WATER PROTECTION PROGRAM
P.O. BOX 176
JEFFERSON CITY, MO 65102-0176

END OF PART A.
REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHETHER PART B NEEDS TO BE COMPLETE.

PART B – LAND APPLICATION ONLY
(Submit only if the proposed construction project includes land application of wastewater.)

8.0 FACILITY INFORMATION

8.1 Type of wastewater to be irrigated: ☑ Domestic ☐ State/National Park ☐ Seasonal business
☐ Municipal ☐ Municipal with a pretreatment program or significant industrial users
☐ Other (explain) _____

8.2 Months when the business or enterprise will operate or generate wastewater:
☑ 12 months per year ☐ Part of the year (list months): _____

8.3 This system is designed for:
☐ No-discharge.
☐ Partial irrigation when feasible and discharge rest of time.
☐ Irrigation during recreational season, April – October, and discharge during November – March.
☐ Other (explain) _____.

9.0 STORAGE BASINS

9.1 Number of storage basins: _____ (Use additional pages if greater than three basins.)

9.2 Type of basins: ☐ Steel ☐ Concrete ☐ Fiberglass ☐ Earthen ☐ Earthen with membrane liner

9.3 Storage basin dimensions at inside top of berm (feet). Report freeboard as feet from top of berm to emergency spillway or overflow pipe.
Basin #1: Length _____ Width _____ Depth _____ Freeboard _____ Depth _____ Safety _____ % Slope _____
Basin #2: Length _____ Width _____ Depth _____ Freeboard _____ Depth _____ Safety _____ % Slope _____
Basin #3: Length _____ Width _____ Depth _____ Freeboard _____ Depth _____ Safety _____ % Slope _____

9.4 Storage Basin operating levels (report as feet below emergency overflow level).
Basin #1: Maximum operating water level _____ ft Minimum operating water level _____ ft
Basin #2: Maximum operating water level _____ ft Minimum operating water level _____ ft
Basin #3: Maximum operating water level _____ ft Minimum operating water level _____ ft

9.5 Design depth of sludge in storage basins.
Basin #1: _____ ft Basin #2: _____ ft Basin #3: _____ ft

9.6 Existing sludge depth, if the basins are currently in operation.
Basin #1: _____ ft Basin #2: _____ ft Basin #3: _____ ft

9.7 Total design sludge storage: _____ dry tons and _____ cubic feet

10.0 LAND APPLICATION SYSTEM

10.1 Number of irrigation sites _____ Total Acres _____ Maximum % field slopes _____
Location: _____ ¼, _____ ¼, _____ ¼, _____ Sec. _____ T _____ R _____ County _____ Acres
Location: _____ ¼, _____ ¼, _____ ¼, _____ Sec. _____ T _____ R _____ County _____ Acres
Location: _____ ¼, _____ ¼, _____ ¼, _____ Sec. _____ T _____ R _____ County _____ Acres
(Use additional pages if greater than three irrigation sites.)

10.2 Type of vegetation: ☐ Grass hay ☐ Pasture ☐ Timber ☐ Row crops
☐ Other (describe) _____

10.3 Wastewater flow (dry weather) gallons per day: Average annual _____ Seasonal _____ Off-season _____

10.4 Land application rate (design flow including 1-in-10 year storm water flows):
Design: _____ inches/year _____ inches/hour _____ inches/day _____ inches/week
Actual: _____ inches/year _____ inches/hour _____ inches/day _____ inches/week

10.5 Total irrigation per year (gallons): Design: _____ gal Actual: _____ gal

10.6 Actual months used for irrigation (check all that apply):
☐ Jan ☐ Feb ☐ Mar ☐ Apr ☐ May ☐ Jun ☐ Jul ☐ Aug ☐ Sep ☐ Oct ☐ Nov ☐ Dec

10.7 Land application rate is based on:
☐ Hydraulic Loading ☐ Other (describe) _____
☐ Nutrient Management Plan (N&P) If N&P is selected, is the plan included? ☐ YES ☐ NO