

Field Trip #1:

Caves, Drip Irrigation, & Educational Tools

8:30 a.m. – 4:30 p.m.
November 2, 2022

Fantastic Caverns is a large tourist attraction for Springfield. Their OWTS has been inadequate for their tourism load. The drip irrigation treatment system will allow the tourism center to keep up with the thousands of tourists that visit each year. Protecting the cave and watershed was of utmost importance to Fantastic Caverns and the area. A tour of the caverns will be included in this field trip. Another unique system tour will include a residential siphon dosed system to a low pressure pipe (LPP) lateral field. A demonstration of the head pressure will be shown on-site. This innovative approach could be used in locations that have limited soil conditions and challenging electricity hookups. Finally, the group will also tour the Missouri Onsite Wastewater Demonstration Training Center. There are several wastewater treatment systems above ground at this facility that are utilized for public and professional education.

Note: Sites will require walking on uneven ground. Appropriate footwear is recommended.

Missouri DHSS CEUs

General CEUs: 4.5

Select: Basic: 2.25, Advanced: 3.5, Inspector: 2.25, OSE: 1, Perc Tester: 0

8:30 a.m. **Field Trip Bus Departure from University Plaza Hotel, Springfield, MO**

9:00 a.m. **Arrive at 1st Stop – Fantastic Caverns**

The OWTS at Fantastic Caverns consists of a large aeration to drip absorption field. The design includes three tanks up at the visitor center; a 1,500 gallon tank followed by two 2,000 gallon tanks designed for flow equalization. The second flow equalization tank has a pump which is timer dosed to the aeration treatment unit down the hill. Ahead of the aeration unit is a 500 gallon tank to slow velocity of effluent into the aeration unit. The aeration unit installed is a Norweco 960 1,000 gallon/day. The timer dose interval is set at 40-gallon dose each hour to equal 960 gallons/day.

The pump tank to the drip field consists of two pumps which dose one zone each. The pump tank is a 2,000 gallon capacity. The drip field is designed into two zones with a combined total of approximately 6,900 feet of drip tubing.

The soils were well drained but the site was limited on space due to topography and close proximity of the floodplain. The system was installed in July and August of 2022. The site provided some challenges during installation. The group will split up into equal sub-groups to tour the facility.

9:15 a.m. Group 1 goes on Caverns Tour; Group 2 tours Geology and Drip System

10:15 a.m. Group 2 goes on Caverns Tour; Group 1 tours Geology and Drip System

- 11:30 a.m. Depart Fantastic Caverns
- 11:45 a.m. **Lunch at Schuyler Community Center**
- 12:30 p.m. Depart Community Center
- 1:00 p.m. **Arrive at 2nd Stop – Moore’s Property: Tour Siphon Dose System with demonstration**

The site visit will include a descriptive explanation of the siphon dosed LPP on-site wastewater treatment system. The system is designed for 240 gallons of maximum daily flow. The septic tank is a 1,000 gallon capacity along with a 500 gallon dosing tank. The siphon used is a model 212 by Fluid Dynamics Inc. The absorption field is 4 LLP lines 60 feet long, 12 inches deep by 12 inches wide. The diameter of the lateral lines is 1.5 inch SCH 40 PVC with 5/32 orifices at 5 foot spacing bedded in 1 to 1.5 inch lateral rock. The supply line from the dosing chamber to the field is 2 inch SCH 40 PVC.

The soils had somewhat slower permeability in the lower horizons due to higher clay content thus requiring a LPP dosed system. An interceptor drain was placed upslope to divert subsurface ground water above the absorption field.

The siphon was able to exceed the projected head pressure of 3 feet. At inspection time each line had approximately 4 feet of head pressure. The only notable difference at inspection being that the draw down was gradual rather than abrupt as with a pump system. Follow up field checks have shown the system to be functioning properly without any failure. A demonstration of the siphon will also be included in the field trip to show the head pressure via manometers at the distal end of the absorption lines.

- 2:15 p.m. Depart Moore’s Property
- 2:45 p.m. **Arrive at 3rd Stop – Missouri OWTS Training Center**

The OWTC, located adjacent to the Watershed Center, serves as an outdoor classroom for wastewater installers. This facility showcases several alternative onsite septic systems, as well as innovative stormwater techniques. Failing septic systems have been shown to contaminate surface and groundwater resources, including wells used for drinking water. Community outreach projects included workshops, onsite rehabilitation and on-site coupons that will cost-share for maintenance. A cost share project provided a landowner enough incentive to work with the Watershed Committee to replace a failing system that was surface discharging directly into the Little Sac.

- 4:00 p.m. Depart Training Center for hotel
- 4:30 p.m. **Arrive back at University Plaza Hotel**

Note: *Itinerary and times subject to change. All attendees are expected to ride the bus transportation provided. No private vehicles are allowed on the field trip tour.*