Implementation of Low Pressure Dose Systems with Various Configurations

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Summary:
This research effort addresses one of the four eligible projects listed in TCEQ Solicitation 582-19-9377, **RT-2.3.3**, which questions the adequacy of North Carolina State Sea Grant College Publication UNC-S82-03 currently used to aid in low-pressure dosing field design. The Solicitation suggests that "research is needed into whether the design can be improved" in terms of effluent distribution over time, and ability to maintain the distribution system.

Texas A&M AgriLife Research will compare two new designs of low-pressure dosing trenches with the control. Both the new designs will have the distribution holes facing up, but one design will use orifice shields on top of each hole, and the other design will use leaching chambers in which the distribution pipe will be placed. The control configuration will be designed with holes facing down following 30 Texas Administrative Code (TAC) Chapter 285, and Publication UNC-S82-03. Septic tank effluent will be used to load the trenches at a loading rate based on the soil textures outlined in 30 (TAC), Chapter 285.

The experimental will be run for a period of one year. Soil moisture probes, inspection ports, and pressure gauges will be used to observe and measure soil moisture next to the trenches, the uniformity of effluent distribution in the trenches, and pressure in the distribution lines. Septic tank effluent samples will be collected and analyzed for Total Suspended Solids (TSS) and 5-day Biochemical Oxygen Demand (BOD5) to determine if the strength is within the typical septic tank effluent range for both parameters. Monitoring will be conducted on a weekly basis.

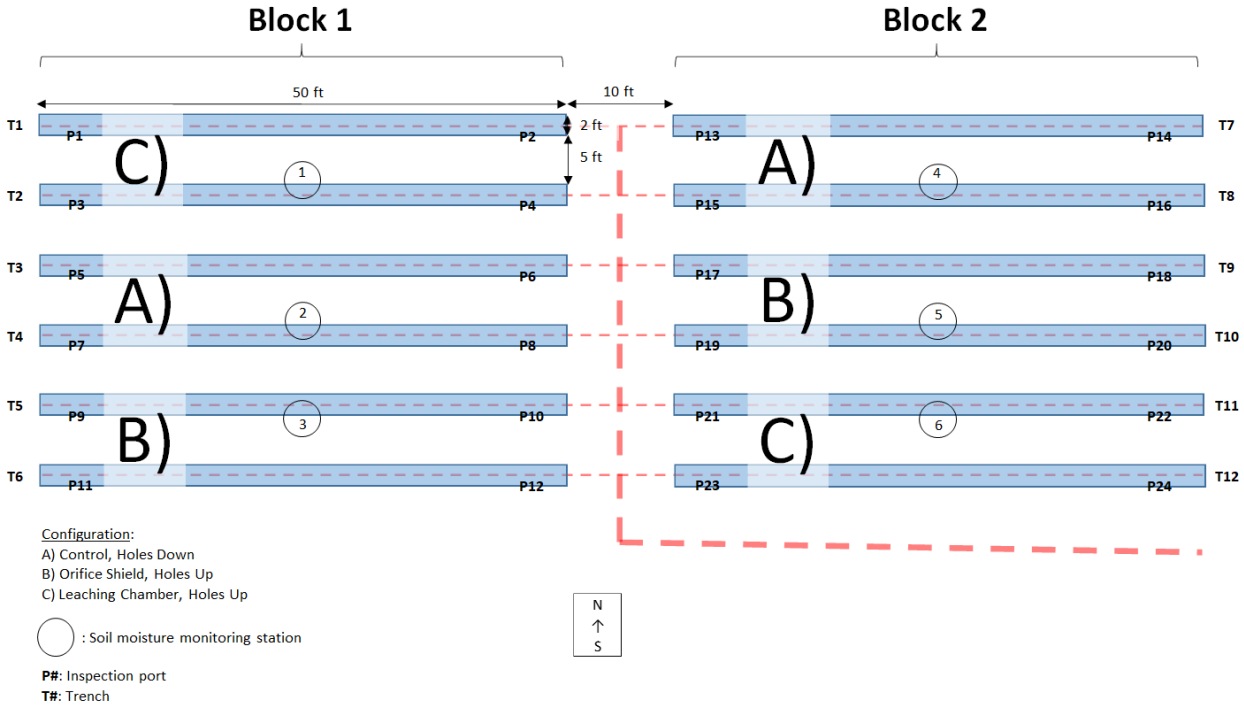
Goals:

1. Identify problems reported by regulators, owners and designers of LPD systems in Texas;
2. Evaluate alternative LPD system designs; and
3. Develop LPD design recommendations to overcome problems reported with the conventional design.

Objectives:

- Create a survey form based on interviews with regulators, owners, and license holders;
- Obtain TCEQ approval of survey and conduct interviews and public education;
- Identify alternative LPD system designs and maintenance schemes based on literature review and additional surveys;
- Select design configurations, obtain TCEQ approval of experimental design, and obtain permit from county;
- Obtain permit and construct experimental LPD system at the research site;
- Run experiment, monitor waste distribution uniformity and maintenance requirements, and analyze the data to determine if the alternative designs perform better, worse, or the same as the conventional design; and
- Submit final report documenting surveys and field demonstration and recommendations for improving LPD design and maintenance along with suggested changes to Texas regulation.

Experimental design



Cross section of the trenches for the three designs