**Course Description:**
Personnel involved in the maintenance of drinking water and wastewater treatment systems are at risk of exposure to both toxic and combustible gases within many areas of a treatment system’s infrastructure. To mitigate the possibility of injury, property damage, or – at worst – fatality brought on from toxic and combustible gas leak exposure, it is vital for system operators to adopt gas leak safety practices to help ensure the health and well-being of both plant personnel and the environment in which they work. This course is designed for all water and wastewater operations professionals in which such practices will be presented. The course will review strategies for gas leak monitoring and detection within a treatment system, as well as methods maintenance personnel should observe when working in areas where toxic or combustible gas leaks are a strong possibility. Options for gas leak detection instrumentation and systems will be discussed, along with basic theories and principles explaining how such equipment works. The configuration and maintenance of a plant’s gas leak detection infrastructure will be discussed within the context of keeping people and property protected and safe.

**Course Agenda:**

8:00-8:30 Welcome and Sign-in

8:30-9:45 Overview
- What is gas detection? Explain difference between leak detection and gas analysis.
- Overview and discussion of the importance of toxic and combustible gas detection in water and wastewater treatment systems. Why have a gas leak detection system in the first place?

**Gas Leak Sensor Types and How They Work**
A discussion on the types of Gas Leak Sensors that are available and the theories behind their operation.
- Electrochemical Gas Sensors
- Catalytic Bead Gas Sensors
- Infrared Gas Sensors

**Gas Leak Detection Systems**
- Define parts of a Gas Leak Detection System (Sensor, Transmitter, Controller)
- How does the system monitor, display, record gas leak levels, and trigger alarms? This includes discussion on Gas Leak Detection System:
  - Input Types
  - Output Types
  - Digital Communications
  - Methods for alerting personnel of dangerous gas leak levels (visible and audible alarm beacons, voice commands, fire department alerts, email/text messaging)
- Discussion of “Explosion Ratings” of equipment intended for operation in areas where combustible gases are always present or are likely to be present and what they mean.
  - “Explosion Proof” versus “Intrinsically Safe” equipment.

9:45-10:00 Break

10:00-11:45 Gas Leak Detection Infrastructure Configuration and Maintenance
- CDC, NIST, and other on-line resources.
- Units of Measure for Gas Leak Concentration Levels: %LEL, ppm, and % Volume and how to convert from one Unit of Measure to the other.
- Quantifying Exposure Limits to Toxic Gases and the concepts of TWA, REL, PEL, and IDLH
- How to select Gas Leak Alarm Set Points.
- How to determine where to physically locate sensors/detectors in a treatment system.
- How to determine how many gas leak detection sensors one requires for a given area?
- What are sensor splash guards and are they necessary?
- Sensor Calibration Frequency
- Bump Testing versus Sensor Calibration

11:30-12:00 Lunch
New Jersey Water Association

November 26, 2019 Toxic and Combustible Gas Detection Training, Mount Olive

12:00-1:15 Where Can Toxic and Combustible Gas Leaks Happen?
- Valves
- Wells
- Pumps/Generators
- Storm water collection (if fuel oil, gasoline, or flammable solvent spills exist)
- Aerobic or Anaerobic breakdown process (especially in enclosed building/structures).
- Disinfectant gas
- Vehicles
- Closing Remarks

1:15 Course Evaluation and Dismissal

Date and Location:
November 26, 2019, Mount Olive Township Senior Center, 204 Flanders-Drakestown Rd., Mount Olive, Morris County (Across the parking lot from the municipal building)

Accreditation:
4.0 TCH for NJ-Licensed Water and Wastewater Operators-Safety. TCH Course Number 04-021903-31.
4.0 Hours, CPWM. 3.0 Technical, 1.0 Management. DLGS-NJWA-170

Instructor:
Dexter Vilar’s experience with industrial process controls and data acquisition dates back to 1992, the year he graduated from Penn State University with a Bachelor of Science Degree in Electrical Engineering. Through the years, he has held positions as a Product Marketing Manager, Technical Writer and Instructor, Territory Manager, and Applications Engineer. Dexter has worked with industrial gas leak detection products and systems for the last 15 years and is currently an Applications Engineer for NSI Neal Systems, Inc. in Newtown, PA. The breadth of his experience in industry has enabled him to engage in key aspects of bringing industrial process monitoring, control, and data management products to market. With a background focused on overseeing the full life cycle of a wide variety of products – from concept to design through to manufacturing and eventual deployment in end-user installations, Dexter’s knowledge of industrial gas leak detection covers both the theoretical and practical, and is something he is very much looking forward to sharing with others in the professional development setting of this seminar.

Please plan to arrive at 8:00 AM

Pre-registration is required, and is available at www.njwater.org