

**CITY OF CHATTANOOGA**  
**Classification Specification Title: Chemist (Wastewater)**

**Department: Wastewater**

**Supervision Received From: Manager Laboratory Services**

**Supervisory Responsibility For: None**

**Pay Grade: WWFG.10E**

**FLSA Status: Exempt**

**Established: 6/29/07**

**Revised Dates: 4/1/25;**

**8/27/24; 5/09/24; 12/11/23;**

**10/20/23; 8/25/22**

**CLASSIFICATION SUMMARY:**

Incumbents in this classification are responsible for performing qualitative and quantitative analysis on a variety of wastewater, industrial and plant samples, including specialized interpretive skills for more complex analysis that requires requiring knowledge and experience operating multiple gas chromatograph/mass spectrometers (GC-MS) and other instrumentation as needed.

Duties include collecting and analyzing samples, preparing samples for analysis, managing GC-MS control data in the laboratory database, preparing and maintaining a variety of records, calibrating laboratory equipment, review of complex technical literature for application, and monitoring laboratory supplies and inventory. Involves working under limited supervision and the use of independent technical judgment and discretion. The Chemist's primary responsibility is to provide technical administration and performance of quantitative analysis for volatile and semi-volatile organic pollutants in wastewater and monitoring well water samples.

**SERIES LEVEL:**

The Chemist is the third level of a five-level laboratory series.

**ESSENTIAL FUNCTIONS:**

*(The following duties ARE NOT intended to serve as a comprehensive list of all duties performed by all employees in this classification, only a representative summary of the primary duties and responsibilities. Incumbent(s) may not be required to perform all duties listed and may be required to perform additional, position-specific duties.)*

Analyzes wastewater samples by performing a variety of standard chemical, bacteriological and physical examinations requiring knowledge of and experience with EPA-approved test methods. Routine analysis includes determination of more than 100 organic compounds using gas chromatography/mass spectrometry (GC-MS).

Develops quality control measures. Analyzes prescribed quality control samples and evaluates the results to ensure they are within required control limits to ensure integrity of results. Applies statistical Quality Assurance/Quality Control techniques to evaluate analytical data and sample

preparation steps. Analyze routine and non-routine environmental samples for the determination of contaminants and chemical parameters.

Assesses each quality control sample and reported sample against a combination of GC-MS EPA method limits and ongoing statistically-derived control limits. Performs GC-MS precision determinations. Documents quality control data and performs ongoing statistical evaluations to store in laboratory files, electronic and/or paper logs and/or the laboratory database. Investigates out-of-control data to determine, if possible, the cause. Takes corrective action to reduce or eliminate future occurrences of aberrant quality control data. Detects unusual situations in the application of established methods and recommends options to the supervisor. Determines approach and methods to use. This work typically involves conventional methods & techniques though it requires going beyond clear precedents, and requires adapting methods to the problems at hand and interpreting findings in terms of their scientific significance.

Operates, calibrates, and maintains complex equipment and instruments, including gas chromatograph/mass spectrometers and a purge & trap system.

Optimizes each calibration curve for each of more than 100 GC-MS compounds. Is responsible for contacting the manufacturer or other contracted experts for technical support, as needed, for complex problems and keeping instrument maintenance logs up-to-date. Determines need for upgrading and replacing instrumentation. Knowledge of mass spectrometry. This knowledge is usually developed after directed and hands-on training.

Prepares wastewater samples for GC-MS analysis via a purge & trap system or by performing organic extraction and concentration. Extraction methods may include separatory funnel liquid-liquid extraction (SFLLE) or continuous liquid-liquid extraction (CLLE). Assesses historical data along with required detection limits to determine the sample preparation technique that will best negate analytical interference.

Uses experience and knowledge of GC-MS gas chromatography mass spectroscopy instrument software to qualitatively and quantitatively interpret mass spectra observed in well water, storm water and wastewater samples. Prepares reports of analytical findings.

Collects and/or receives wastewater samples, industrial waste samples, stormwater samples, landfill samples, and chemical samples; verifies and maintains chain-of-custody for samples in a way that maintains the legal defensibility of the records.

On-call, as needed, to initiate water quality testing after normal business hours. May be required to work even during trying times such as epidemics or pandemics and during times of emergency declarations, since much of the data generated is essential to regulatory requirements and for operational purposes.

Works with and around hazardous chemicals and wastewater, which may impose a risk of personal injury or contracting of infectious disease.

Primarily responsible for generating data used to determine compliance with State and Federal regulations and applicable environmental permits issued to the City. Signs an affidavit each

month attesting to the truth, accuracy, and completeness of data produced with penalty of discipline up to and including termination.

Responsible for generating data used to determine efficient operation of the City's wastewater treatment plant. Data produced are used to make adjustments to wastewater operations, as needed.

Required to pass an EPA-mandated proficiency study of blind samples annually; document any issues; make corrections and retest any parameters that are not within study acceptance limits.

Signs documents and keeps records in such a way that these may be used in a court of law, if necessary.

Immediately notifies interested parties of permit violations or other aberrant results requiring attention, reporting to regulatory authorities, or correction.

Enters testing results directly into the laboratory database; or enters raw data into spreadsheets and imports calculated values into the laboratory database for review. Exports data to operational databases, as necessary, for use by other groups within the City. Reviews for completeness and accuracy data entered by other employees.

Prepares standard solutions and reagent solutions for use in daily analytical testing in accordance with quality control procedures and standard operating procedures.

Reviews for accuracy and updates standard operating procedures required for laboratory analysis.

Maintains safety data sheet binders for the main laboratory and the GC-MS laboratory.

Records quantities of lab supplies and chemicals taken from the stockroom to assist in maintaining an adequate supply at all times. Determines supplies needed for GC-MS analysis and maintains an inventory for that area.

Independently prioritize primary job functions to meet hold times and deadlines. Assist Lab Analyst/Technician with performance of their duties during times of staff shortages.

Assists senior staff with assignments, as needed.

Must meet regular attendance requirements.

Must be able to maintain good interpersonal relationships with staff, co-workers, managers and citizens.

Must accomplish the essential functions of the job, with or without reasonable accommodations, in a timely manner.

Performs other duties as assigned.

This position is deemed essential during inclement weather situations, and must report to or remain at work, even when administrative closings are announced, as determined by the Department Head.

#### DEPARTMENT SPECIFIC DUTIES (if any):

#### MINIMUM QUALIFICATIONS:

Bachelor's Degree in Chemistry, Biology, Environmental Science, or a related field and five (5) years laboratory analysis experience, including experience operating a gas chromatograph/mass spectrometer is preferred or any combination of equivalent experience and education. Must have experience using spreadsheet software and databases to compile and process numerical or statistical data.

#### LICENSING AND CERTIFICATIONS:

Valid Driver's License.

#### KNOWLEDGE AND SKILLS:

Knowledge of chemistry theory and concepts; laboratory safety practices; environmental GC/MS applications; organic chemistry principles; solvent extractions; basic wet chemistry laboratory procedures; laboratory equipment, machinery, tools, and materials; data analysis techniques; advanced spreadsheet concepts; total organic carbon and atomic absorption analysis techniques; mathematical concepts; and, chain of custody principles; knowledge of complex sample preparation, analysis on and maintenance on complex instruments

Skill in performing basic wet chemistry laboratory procedures; performing solvent extractions; operating GC/MS; performing total organic carbon and atomic absorption analysis; operating, maneuvering, and controlling the actions of applicable laboratory equipment, machinery, tools, and materials; evaluating, auditing, deducing, and assessing data utilizing established guidelines; performing mathematical calculations, including linear regression; interpreting diagrams; and communication and interpersonal skills as applied to interaction with coworkers, supervisor, the general public, etc. sufficient to exchange or convey information and to receive work direction; Skill in utilizing complex calibration, data interpretation and maintenance/troubleshooting.

Analysis requires specialized interpretive skills using complex analytical systems and instrumental analysis via gas chromatography mass spectroscopy. Knowledge of laboratory quality assurance and control practices and procedures to apply to the GC-MS area and other areas. Understands chromatographic separation techniques, including flow and temperature variables. Able to evaluate specific constituents within the chromatographic system and manipulate these individual variables to create an efficient and viable method for testing.

#### PHYSICAL DEMANDS:

Positions in this class typically require: reaching, standing, walking, fingering, grasping, talking, hearing, seeing, and repetitive motions.

#### WORK ENVIRONMENT:

Light Work: Exerting up to 20 pounds of force occasionally, and/or up to 10 pounds of force frequently, and/or negligible amount of force constantly to move objects. If the use of arm and/or leg controls requires exertion of forces greater than that for Sedentary Work and the worker sits

most of the time, the job is rated for Light Work. Exerting up to 50 pounds of force occasionally and/or up to 20 pounds of force frequently and/or up to 10 pounds of force constantly to move objects.

Incumbents may be subjected to fumes, odors, dusts, gasses, poor ventilation, hazardous chemicals, and infectious diseases.

**SPECIAL REQUIREMENTS:**

Safety Sensitive: N

Department of Transportation - CDL: N

Child Sensitive: N

The City of Chattanooga, Tennessee is an Equal Opportunity Employer. In compliance with the Americans with Disabilities Act, the City will provide reasonable accommodations to qualified individuals with disabilities and encourage both prospective and current employees to discuss potential accommodations with the employer.