



Fort Collins Water Treatment Facility Standard Operating Procedure Purchasing Liquid Carbon Dioxide

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PURPOSE

Establish guidelines for purchasing/delivering Liquid Carbon Dioxide (CO₂) for the Fort Collins Water Treatment Facility (FCWTF).

The mission of the Fort Collins Water Treatment Facility (FCWTF) is to "provide the community with a continuous ample supply of treated water that is pleasing, wholesome, free from known health risks, and affordable. The FCWTF purchases products by determining best value for the City. Best value is calculated by combining the following four components: (1) the chemical has been tested in the Pilot Plant and/or approved by the Water Treatment Quality Coordinator; (2) the chemical can meet or exceed all FCWTF standards, the AWWA standards, the NSF standards, and any other regulatory agency standards; (3) the supplier can meet all the FCWTF requirements; and (4) the cost is factored in once it has been determined that a supplier can meet items (1), (2), and (3) above.

HEALTH AND SAFETY ISSUES

For detailed information, please refer to the MSDS

1. CO₂ is primarily an oxidizer. Other hazard classes include cryogenic.
2. NFPA Hazard Rating includes:
 - Health=1
 - Flammability=0
 - Reactivity=0
 - Special=Oxidizer
3. Personal Protective Equipment:
 - Gloves for cryogenic atmospheres. Goggles or a full-face shield. Carbon dioxide portable analyzer. For spill clean up, SCBA's should be worn.
4. Delivery vehicles:
 - Trucks leaking any liquids, powders, substances, etc.; will not be allowed on FCWTF property. All trucks must use chock blocks on tires; these blocks will be supplied by FCWTF.





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5. Delivery Containers:

- In accordance with AWWA B510-95, the CO₂ bulk shipment containers will be pressure vessels manufactured to American Society of Mechanical Engineers (ASME) pressure vessel code and comply with the U.S. DOT regulations for hazardous materials.

INFORMATION FOR THE FORT COLLINS WATER TREATMENT FACILITY (FCWTF)

1. CO₂ is budgeted in account 502-032201-534260.
2. CO₂ is used in the FCWTF Corrosion control program. CO₂ and Lime are combined at the pre treatment and the clearwell stage to add alkalinity and hardness to the water and thereby provide corrosion control.
3. FCWTF requires CO₂ to have a minimum of 99.5 percent purity.
4. FCWTF requires CO₂ to be delivered in bulk quantities.
5. FCWTF has storage capacity for 380,000 pounds of carbon dioxide. There are two 160,000 pound liquid storage tanks and one 60,000 pound.
6. FCWTF requires that CO₂ be delivered within **48 hours** of an order.
 - A. FCWTF has used over 5,000 lbs. of CO₂ in one day. FCWTF protocol requires the container to be between 15,000 and 10,000 lbs. before delivery. A container with only 10,000 lbs. limits FCWTF to 2 days of CO₂.
7. FCWTF will reject delivery of any bulk shipments which appear to be leaking, forming ice on the outside of valves, or have any damaged piping, tubing, hoses, or fittings. The Supplier will pay the freight charges for all rejected shipments.

CO₂

1. CO₂ must meet the American Water Works Association (AWWA) Standard B510-95.
 - A. Commercial carbon dioxide suitable for use will have a carbon dioxide content of at least 99.5 percent, by weight.
 - B. CO₂ shall contain no soluble inorganic or organic substances in quantities capable of producing deleterious or injurious effects on the health of those consuming the water or that would otherwise render the water that had been treated properly with CO₂ unfit for public use.
 - a. Potential impurities including hydrocarbons, hydrogen sulfide, nitrogen dioxide, ammonia, radon, and sulfur dioxide.
 - C. Water content of CO₂ shall not exceed 220 ppm (volume per volume (v/v)-32°F) at the time of delivery.

SUPPLIER

1. Supplier must be able to supply CO₂ in bulk quantities.
2. Supplier must be able to supply CO₂ within 48 hours of the telephone order.
3. Supplier must provide an analysis of impurities with each shipment. The analysis shall be submitted prior to delivery. The analysis should include, but is not limited to: acetaldehyde,





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benzene, carbon monoxide, carbonyl sulfide, hydrogen sulfide, hydrogen, methane, moisture, other hydrocarbons, oxygen, radon, and sulfur dioxide. This analysis can be faxed ahead of the delivery or delivered by the driver at the time of delivery.

4. The supplier must ensure that the shipment is delivered in tank trucks in pressure vessels manufactured to American Society of Mechanical Engineers (ASME) pressure vessel code and complying with the US DOT regulations for hazardous material transportation.
5. Each year in January, the supplier will mail to FCWTF a new copy of the MSDS sheet.
6. Each year in January, the supplier will mail to FCWTF a copy of the NSF Certification.
7. Supplier will be responsible for the shipping costs of the shipment if the delivery is rejected and returned because it does not meet the standards expressed in this SOP.

DELIVERY

1. All chemical suppliers must fax to the FCWTF (970-221-6736) the following information **prior** to delivery:
 - a) the name of the driver making the delivery
 - b) the numbers of the tractor and trailer transporting the chemical
2. All delivery drivers are required to call in from the facility's front gate. The receptionist or person answering the telephone must contact the Duty operator for permission to allow the delivery on site.
3. The delivery driver will dock at the appropriate unloading station and FCWTF personnel will visually inspect the vehicle and container.
4. FCWTF personnel will verify that the faxed information matches up with the driver and the delivery vehicle arriving at the FCWTF. If the driver's ID or the tractor and trailer numbers do not match, the delivery will not be accepted.
5. The security verification, the supplier's quality assurance analysis, and the City's lab analysis will be given to the Water Quality Coordinator in order to identify the load in the event of any problems.
6. Delivery drivers will provide a sample and submit it to the Operator at the time of delivery. The driver will be instructed on how the samples will be taken:
 - A. The sample draw will be from the main discharge line of the truck.
 - B. Protective gloves are required when taking and delivering the sample
7. The Operator will take the sample to the on-site Laboratory Technicians for analysis.
8. Delivery drivers are required to provide certified weight tickets for both the empty and loaded weights of the tractor and trailer unit. All weight tickets should have the tractor and trailer numbers written on them, as well as the name of the facility, FCWTF.
9. Delivery must be made within **48 hours** of the order being placed.
10. Delivery may only be made **Monday through Friday from 8 A.M. to 5 P.M.**
11. Delivery drivers are responsible for off-loading the CO₂.
12. Delivery drivers are required to chock and unchock their trucks.
13. Delivery Drivers are to be familiar with the location of phones, alarms, and emergency showers that are nearest to the off-load location.
14. FCWTF will reject delivery of any bulk shipments that are leaking, forming ice on the outside of valves or have damaged piping, tubing, hoses, or fittings.





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PURCHASING

1. All contracts and purchases will be made in accordance with the City of Fort Collins Purchasing Department (FCPD) Purchasing Procedures. A copy can be obtained through the Purchasing Department. The Purchasing Department will ensure adherence to the FCPD Purchasing Procedures.
2. FCWTF requires that all suppliers submit the names, locations, and phone numbers of three current clients as part of any bidding process.
3. FCWTF requires that all suppliers submit a list of intended delivery agents (motor carrier) and a letter from the U.S. Department of Transportation, Federal Highway Administration, stating the Motor Carrier Safety Rating for the company as part of any bidding process. Each listed motor carrier's rating must be **Satisfactory** or above to be considered in the bidding process.
4. FCPD representatives are responsible for ensuring that the items noted in this SOP can be met by the supplier before any contract is awarded.
5. The FCWTF and FCPD will establish, at the beginning of each New Year, a Blanket Purchase Order.
6. FCWTF Operations/Process Supervisor or his designee will place delivery orders on that Purchase Order throughout the year. FCWTF must be able to place orders using telephone, fax, or electronic mail.
7. When placing an order, a delivery date will be specified.
8. This SOP can act as the sole-source justification if only one supplier can meet the criteria specified above.

