The City of Wynne is accepting bids on the following: Five (5) self-contained breathing apparatus units. Bids can be emailed to mmcknight@cityofwynne.com or mailed/drop off at 206 S. Falls BLVD ATTN: Meredith McKnight, Wynne AR 72396. Bids will be accepted until 9/30/2024 at 9:59am. Bids will be opened at 10:00am on 9/30/2024 at Wynne City Hall.

General Self-Contained Breathing Apparatus Requirements

The purpose of this bid specification is to establish the minimum requirements for an open-circuit self-contained breathing apparatus (SCBA). The SCBA shall consist of the following major sub-assemblies: (1) full facepiece assembly; (2) a removable, facepiece-mounted, positive pressure breathing regulator with air-saver switch; (3) an automatic dual path redundant pressure-reducing regulator; (4) end-of-service time indicators; (5) a harness and back frame assembly for supporting the equipment on the body of the wearer; (6) a shoulder strap mounted, remote gauge indicating cylinder pressure; (7) a rapid intervention crew/universal air connection (RIC/UAC); and (8) cylinder and valve assembly for storing breathing air under pressure.

The successful bidder agrees to provide, at their own expense, a factory trained instructor for such time as the respirator user shall require complete instruction in the operation and maintenance of the respirator. Any exceptions to these specifications must be detailed in a separate attachment. Failure to do so will automatically disqualify the bidder.

The successful bidder must be a sales distributor, authorized by the manufacturer, to sell the equipment specified herein.

Regulatory Approvals

The SCBA shall maintain all NIOSH standards with any of the following types of cylinders listed as provided by the SCBA manufacturer.

The SCBA shall be approved to NIOSH 42 CFR, Part 84 for chemical, biological, radiological and nuclear protection (CBRN).

The SCBA shall be compliant to the NFPA 1981, 2018 Edition, Standard on Open-Circuit Self-Contained Breathing Apparatus for Emergency Services.

The SCBA shall be compliant to the NFPA 1982, 2018 Edition.

All electronic components shall be approved for Intrinsic Safety under UL 913 Class I, Groups C and D, Class II, Groups E, F and G, Hazardous locations.

Facepiece

The facepiece shall have a large diameter inlet serving as the female half of a quarter (1/4) turn coupling which mates with the positive pressure breathing regulator.

The facepiece shall be approved for use with multiple respiratory applications to enable the same user to switch from one application to another without the use of tools and without doffing the facepiece.

The full facepiece assembly shall fit persons of varying facial shapes and sizes with minimal visual interference.

The full facepiece assembly shall be available in three sizes marked “S” for small, “M” for Medium and “L” for large.

The facepiece sizes shall be easily identifiable through a color-coding scheme.

The facepiece assembly, including head harness, shall be latex free.

The facepiece series shall have a faceseal that is secured to the lens by a U-shaped channel frame that is retained to the lens using two fasteners.

The faceseal shall be a single design for enhanced fit and comfort.

The facepiece shall contain inhalation valves that are readily visible to enable quick visual inspection.

The lens shall be a single, replaceable, modified cone configuration constructed of a non-shatter type polycarbonate material.

In accordance with NIOSH 42 CFR part 84, the facepiece shall meet the penetration and impact requirements, including compliance with ANSI Z87.1 – 2010.

The lens shall have a coating to resist abrasion and chemical attack and meet the requirements of NFPA 1981 for lens abrasion.

The lens shall have an internal anti-fog coating to reduce fogging of the lens.

Multi-directional voicemitters shall be mounted on both sides of the facepiece and ducted directly to an integral silicone nose cup to enhance voice transmission

The facepiece assembly shall be able to incorporate multiple electronic communications options (amplification, radio interface, radio direct interface) without affecting NIOSH approvals or NFPA/CBRN approvals where applicable.

The facepiece shall enable the installation of communications bracket on either the right or left side.

The head harness shall be available in a five-point suspension made in the fashion of a net hood to minimize interference between securing of the facepiece and the wearing of head protection.

The head harness shall be available in a five-strap and four-strap configuration.

The head harness shall be constructed of a para-aramid material for fire, first responder and CBRN applications.

The head harness shall include either a positioning strap or an integrated handle to assist with donning of the facepiece.

Two flame resistant elastic straps, attached to the face seal in four locations, shall provide adjustment for proper face sealing.

Mask-Mounted Regulator

The facepiece-mounted positive pressure-breathing regulator shall supply and maintain air to the facepiece to satisfy the needs of the user at a pressure greater than atmospheric by no more than 1.5 inches of water pressure static.
The breathing regulator shall maintain positive pressure during flows of up to 500 standard liters per minute.

The breathing regulator shall also meet or exceed a dynamic flow requirement of remaining positive while supplying a minute volume of 160 liters.

The breathing regulator shall have attached a low-pressure hose which shall be threaded through the left shoulder strap to couple to the pressure-reducing regulator mounted on the back frame.

The low-pressure hose shall be equipped with a swivel attachment at the facepiece mounted breathing regulator.

The breathing regulator shall connect to the facepiece by way of a quarter (1/4) turn coupling.

The user shall hear an audible sound when the breathing regulator is attached correctly to the facepiece.

The breathing regulator shall be equipped with a doughnut-shaped gasket which provides a seal against the mating surface of the facepiece.

The breathing regulator cover shall be fabricated of a flame resistant, high impact plastic.

The breathing regulator shall have a demand valve to deliver air to the user, activated by a diaphragm responsive to respiration.

The demand valve shall use an extended temperature range dynamic O-ring seal composed of a fluorosilicone elastomer.

The diaphragm shall include the system exhalation valve and shall be constructed from a high strength butyl elastomer.

A purge valve shall be situated at the inlet of the breathing regulator and shall be capable of delivering airflow of between 125 and 225 standard liters per minute.

The breathing regulator shall be designed to direct the incoming air through a spray bar and over the inner surface of the facepiece lens for defogging purposes.

The components of the breathing regulator shall be constructed of materials that are not vulnerable to corrosion.

The flame-resistant cover shall contain an air saver switch and pressure demand bias mechanism.

The breathing regulator shall reactivate and supply air only in the positive pressure mode when the wearer affects a face seal and inhales.

This device shall not affect the breathing flow through the system while in operation.

Pressure Reducer w/Snap-Change Cylinder Connection

The pressure-reducing regulator shall be mounted at the waist on the back frame and be coupled to the cylinder valve through a patented stainless-steel quick connect snout for engagement and sealing within the cylinder valve outlet.

The cylinder shall be secured to the pressure-reducing regulator with two pull-rings 180° from each other.

A stainless-steel rod shall secure each of the pull-rings to prevent removal of the cylinder while the SCBA is pressurized.

The stainless-steel rods shall be actuated when the cylinder is opened and when cylinder pressure is above 30 psig.

In lieu of a manual bypass, the pressure-reducing regulator shall include a back-up pressure-reducing valve connected in parallel with the primary pressure-reducing valve and an automatic transfer valve for redundant control.

The back-up pressure-reducing valve shall also be the means of activating the low-pressure alarm devices in the facepiece-mounted breathing regulator.

This warning shall denote a switch from the primary reducing valve to the back-up reducing valve whether from a malfunction of the primary reducing valve or from low cylinder supply pressure.

A press-to-test valve shall be included to allow functional testing of the back-up reducing valve.

The pressure-reducing regulator shall have extended temperature range dynamic O-ring seals composed of fluorosilicone elastomer.

The pressure-reducing regulator shall have incorporated a reseatable over-pressurization relief valve which shall prevent the attached low-pressure hose and facepiece-mounted breathing regulator from being subjected to high pressure.

End of Service Time Indicator

The SCBA shall have two end-of-service time indicators (EOSTI). A tactile alarm and a Heads-Up Display (HUD).
The primary EOSTI shall be the integral low-pressure alarm device that shall combine an audible alarm with simultaneous vibration of the facepiece.

The primary EOSTI shall be located in the facepiece-mounted positive pressure breathing regulator.

This alarm device shall indicate either low cylinder pressure (35% +/- 2%) or a malfunction of the primary pressure-reducing valve (first stage regulator).

The HUD shall serve as the secondary EOSTI.

The HUD shall be powered by the SCBA's single power supply.

It shall be mounted in the user's field of vision on the facepiece-mounted positive pressure breathing regulator.

It shall display cylinder pressure in increments of 100%, 75%, 50% and 35%.

The display shall not have a numerical representation of cylinder pressure.

At full cylinder pressure, two green Light Emitting Diodes (LED) shall be illuminated.

At three-quarter cylinder pressure, one green LED shall be illuminated.

At one-half cylinder pressure, one "yellow" LED shall be illuminated and flash at a rate not to exceed one (1x) time per second.

At one-third cylinder pressure, one "red" LED shall be illuminated and flash at a rate not to exceed ten (10x) times per second.

The HUD shall have a low battery indication that is distinct and distinguishable from the cylinder pressure indications.

Harness and Back frame Assembly

A lightweight, lumbar support style back frame and harness assembly shall be used to carry the cylinder and valve assembly and the pressure-reducing regulator assembly.
The back frame shall be a solid, one-piece black powder-coated aluminum alloy frame that is contoured to follow the shape of the user's back.

The back frame shall include a shroud to streamline hose and wire management by minimizing exposure of the low-pressure hose and electronics molded cable.

The back frame shall include a mounting for the pressure reducing regulator located at the waist.

The back frame shall include an over-the-center, adjustable tri-slide fixture, a para-aramid strap and a double-locking latch assembly to secure 30, 45, 60, or 75-minute cylinders.

The back frame shall include a mounting area suitable for installation of a distress alarm integrated with the SCBA.

The mounting area shall permit installation of a distress alarm sensor module in an area between the pressure reducer and the back frame.

The harness assembly shall include a waist pad and shoulder pads constructed of an outer shell material and incorporating a closed-cell foam design to help minimize water absorption.

The harness assembly shall incorporate parachute-type, quick-release buckles with an integrated bail to help secure the webbing.

The harness assembly shall consist of a one size black para-aramid strap with two red stripes along the outer edges and a reflective stripe in the center for enhanced visibility.

The harness assembly shall include a seat-belt type waist belt attachment.

The harness assembly shall include box-stitched construction with no screws or bolts.

The harness assembly shall be removable from the back frame without the use of tools.

The harness assembly shall be machine washable to help with exposure reduction.

The harness assembly shall accommodate a waist belt extension.

The waist pad shall be attached to the back frame such that movement by the wearer provides natural articulation. Articulation shall be accomplished without the use of mechanical devices.

The waist pad and belt shall freely wrap around and conform to the wearers' hips.

The shoulder harness shall be fitted with a Drag Rescue Loop (DRL) capable of being deployed in an emergency situation to drag a downed firefighter to safety.

The Drag Rescue Loop (DRL) shall be sewn into the shoulder harness assembly and shall provide a horizontal pull strength of 1000 lbs.

The Drag Rescue Loop (DRL) shall be stored in a manner to prevent accidental snag but maintain accessibility with gloved hands.

The shoulder harness shall be attached to the back frame such that the harness presents itself for ease of donning.

The shoulder harness shall include reflective material to enhance the visibility of the wearer in low-light conditions.

The shoulder harness shall accommodate two distinct positions for a chest strap attachment.

The shoulder harness shall accommodate a mounting clip for attachment of a handheld radio remote speaker microphone.

Rapid Intervention Crew / Universal Air Connection (RIC/UAC)

The SCBA shall incorporate a RIC/UAC fitting to be compliant with the 2018 edition of the NFPA 1981 Self-Contained Breathing Apparatus standard.
The RIC/UAC shall be an integral part of the pressure reducer and protected by the back frame.

The RIC/UAC inlet connection shall be within 4” (4-inches) of the tip of the CGA threads of the cylinder valve.

The RIC/UAC shall consist of a connection for attaching a high-pressure air source and a self-resetting relief valve allowing a higher pressure than that of the SCBA to be attached to the SCBA.

The self-resetting relief valve shall be color-coded to identify pressure rating of the SCBA.

The RIC/UAC shall have a check valve to prevent the loss of air when the high-pressure air source has been disconnected.

Cylinder
The cylinder threads shall be straight with an O-ring or quad-ring gasket type seal.

The cylinder valve shall be a “fail open” type, constructed of forged aluminum and designed such that no stem packing or packing gland nuts are required.

It shall contain an upper and lower seat such that the pressure will seal the stem on the upper seat, thus preventing leakage past the stem.

No adjustment shall be necessary during the life of the valve.

The cylinder valve shall be designed with a patented stainless-steel quick connect snout that delivers air directly to the first stage pressure-reducing regulator. The quick connect snout shall be an integral part of the cylinder valve, rather than an adapter that threads onto the CGA fitting.

The cylinder valve shall be offered with a CGA 346 or CGA 347 fitting for the purposes of filling the cylinder only.

The fill fitting shall have a check valve to prevent flow from the cylinder.

The fill fitting shall be provided with a dust cover to protect threads from damage and prevent interior surfaces from being contaminated when not in use.

The dust cover shall be retained to the cylinder valve.

Each cylinder valve shall consist of the following: 1) a hand activated valve mechanism with a spring-loaded, positive action, ratchet type safety lock and lock-out release for selecting “lock open service” or “non-lock open service”; 2) an upstream connected frangible disc safety relief device; 3) a dual reading pressure gauge indicating cylinder pressure at all times; 4) an elastomeric bumper; 5) an angled outlet.

The cylinder valve shall have an RFID tag molded into the elastomeric bumper with a universal RFID marking embossment.

The RFID tag shall be capable of storing product specific information, including serial number, manufacture date, hydrostatic test date, pressure rating, life expectancy, and fill logs.

The SCBA shall maintain all NIOSH and NFPA standards with any of the following types of cylinders listed as provided by the SCBA manufacturer.

The cylinder shall be manufactured in accordance with DOT specifications and meet the Transport Canada requirements with working pressures of 4500 psig.

The cylinder shall be lightweight, composite type cylinder consisting of an aluminum alloy inner shell, with a total overwrap of carbon fiber, fiberglass and an epoxy resin.

The cylinder shall have a 2D barcode located under the protective gel coat programmed with the following information, at a minimum: serial number, manufacture date, and hydrostatic test date.

The cylinder shall be a 45-minute duration based on the NIOSH breathing rate of 40 liters per minute (lpm).

Warranty

The unit shall be covered by a warranty providing protection against defects in materials and workmanship. The warranty period shall be for as long as the SCBA is owned by the original purchaser. This warranty shall not require a registration in order to activate. This warranty shall not be contingent upon completing mandatory overhaul or recommended preventative maintenance.

Personal Alert Safety System with Firefighter Locator

The PASS Device shall be compliant to the NFPA 1982, 2018 Edition Standard on Personal Alert Safety Systems.
Operation of this distress alarm shall be initiated with the opening of the valve of an SCBA charged cylinder.

The system shall feature a “hands-free” re-set capability that may be activated by means of a slight movement of the SCBA when the system is in a pre-alarm mode.

The system shall operate from a single power source containing six “AA” batteries

The battery life of the SCBA with PASS only shall be no less than 200 hours.

The system shall have a battery check function that provides an LED indication of battery status while the SCBA is not pressurized.

When the PASS is manually activated, the locator system shall immediately emit a 2.4 GHz signal to be received by a separate hand-held receiver.

When the PASS is activated due to lack of motion, the locator system shall have a ten second delay prior to emitting a 2.4 GHz signal to be received by a separate hand-held receiver.

The system shall utilize a 2.4 GHz signal to provide the best path to a “downed” firefighter.

The locating system shall be programmable with eight alpha-numeric characters to provide identification information.

The PASS device shall contain two components: a Console and a Sensor Module.

When the PASS device goes into pre-alarm, the user shall be notified through a distinct light pattern in the breathing regulator-mounted HUD display.

The console shall be located on the user’s right shoulder harness.

The console shall contain an integral edge lit mechanical pressure gauge that is automatically turned on by opening the cylinder valve.

The console shall display to the user the following:
Pre-Alarm: alternating red flashing LED's;
Full Alarm: dual flashing red LED's and a flashing PASS icon.
Low Battery: red flashing LED's.
Normal System Operation: flashing green LED.

The console shall contain a photo sensing diode that automatically adjust the brightness of the HUD as the ambient lighting conditions change.

The console shall contain an integrated RFID tag.

The console shall contain push buttons for user interface.

The push buttons shall be designed to minimize accidental activation.

A yellow color-coded push button shall permit system re-set.

A red color-coded push button shall permit manual activation of the full alarm mode.

The console shall be equipped with a LED "External HUD" allowing others to determine the wearer's cylinder pressure through the same color-code scheme as the breathing regulator-mounted HUD.

A green LED shall be illuminated across the gauge face to indicate a cylinder with greater than half cylinder pressure.

A yellow LED shall be illuminated across the gauge face to indicate a cylinder with less than half cylinder pressure.

A red LED shall be illuminated across the gauge face to indicate a cylinder with less than 35%-cylinder pressure.

The system shall include a sensor module mounted to the SCBA back frame and located in an area between the cylinder and back frame in a manner designed to protect the assembly from damage.

The sensor module shall contain a motion sensor that is sensitive to user hip movement to reduce false activations.

The sensor module shall contain redundant, dual sound emitters for the audible alarm and dual visual "buddy" indicator lights.

The sensor module sound emitters shall be oriented in multi-directions for optimal sound projection.

The sensor module sound emitters shall broadcast a unique alarm tone for the following conditions: Pre-alarm PASS, Full-alarm PASS, EVAC, System Integrity, PAR, and Low-battery.

The visual indicators on the back frame mounted sensor module shall flash green during normal operation.

The visual indicators shall flash red when the device is in pre-alarm and full alarm.

The visual indicators shall flash orange when the SCBA has reached one-half cylinder pressure.

The visual indicators shall flash a combination of red, green, and white when the SCBA has reached 35%-cylinder pressure.

The sensor module shall have a Bluetooth chip set integral to the unit to provide wireless connectivity to external devices.