



# Dry Fork Station Procedure

<b>Procedure No.</b> 01-SP-002	<b>Revision No.</b> J	<b>Page</b> 1	<b>Of</b> 29
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<b>Subject</b> Confined Space Program			

## 1.0 PURPOSE / SCOPE

### 1.1 Purpose

- 1.1.1 Confined space entry procedures are designed to prevent unauthorized entry into confined spaces and reduce the risk of accidents and injuries to employees, visitors and contractors while working in and around confined spaces at the Dry Fork Station (DFS).
- 1.1.2 To establish positive controls to minimize risks associated with entry into confined spaces.
- 1.1.3 To prevent unexpected exposure to hazardous materials, engulfment hazards, oxygen deficient and/or toxic atmospheres.
- 1.1.4 To plan for a timely and effective response to an emergency condition.

### 1.2 Scope

- 1.2.1 This program is developed to identify, evaluate, and control confined spaces. Procedures and responsibilities are defined in this program for working and entering confined spaces.
- 1.2.2 This program establishes minimum requirements for periodic inspections which ensure that the program is being followed and sets requirements for employee and contractor training.
- 1.2.3 Employees and contractors selected as an Authorized Entrant, Attendant or Entry Supervisor will perform duties as outlined in this program.

## 2.0 DEFINITIONS OF TERMS

- 2.1 Attendant: a qualified employee stationed outside one or more permit spaces, which monitors the authorized entrants and performs all attendant duties assigned by the Confined Space Program. Attendants may be assigned to monitor more than one permit space provided their duties can be effectively performed for each permit space that is monitored.
- 2.2 Authorized Entrant: a qualified employee authorized by the entry supervisor to enter a confined space.
- 2.3 Blanking or Blinding: the absolute closure of a pipe, line or duct by the fastening of a solid plate that completely covers the bore and that is capable of withstanding the maximum pressure of the pipe, line or ducts with no leakage beyond the plate.



# Dry Fork Station Procedure

Subject	Procedure No.	Revision No.	Page
Confined Space Program	01-SP-002	J	2

- 2.4 Clearance: Lockout/Tagout procedure for DFS, to ensure employees safety. Please reference the Clearance Program.
- 2.5 Confined Space: a space that:
- 2.5.1 Is large enough and so configured that a person can bodily enter and perform assigned work; and
  - 2.5.2 Has limited or restricted means for entry or exit (for example: tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry); and
  - 2.5.3 Is not designed for continuous occupancy.
- 2.6 Contracted Rescue Team: a rescue team contracted by Basin Electric to provide rescue services.
- 2.7 Declassified (Non-Permit Required) Confined Space: a confined space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious bodily harm.
- 2.8 Double Block and Bleed: the closure of a line, duct, or pipe by closing and locking/tagging two in-line valves and by opening and locking/tagging a drain or vent valve in the line between the two closed valves.
- 2.9 Emergency Response Team: on-site, BEPC employees trained in rescue and/or response techniques. Also known as an Emergency Responder.
- 2.10 Engulfment: the surrounding and effective capture of a person by a liquid or finely divided (flowable) solid substance that can be aspirated to cause death by filling or plugging the respiratory system or that can exert enough force on the body to cause death by strangulation, constriction or crushing.
- 2.11 Entry: the action by which a person passes through an opening into a confined space. Entry includes the ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.
- 2.12 Entry Supervisor: a qualified employee assigned and responsible for determining if acceptable entry conditions are present at a confined space where entry is planned, for authorizing entry and overseeing entry operations and for terminating entry as required.
- 2.13 Entry Team: the entry team may consist of the Entry Supervisor, Attendant, Authorized Entrants and/or Operating Authority.



# Dry Fork Station Procedure

Subject	Procedure No.	Revision No.	Page
Confined Space Program	01-SP-002	J	3

- 2.14 Hazardous Atmosphere: an atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue, injury, or acute illness from one or more of the following causes:
- 2.14.1 Flammable gas, vapor, or mist in excess of 0% of its lower explosive limit (LEL),
  - 2.14.2 Airborne combustible dust at a concentration that meets or exceeds its (LEL) or obscures vision at a distance of five (5) feet or less,
  - 2.14.3 Atmospheric oxygen concentration below 19.5% or above 23.5 %,
  - 2.14.4 Atmospheric concentration of any substance which could result in employee exposure in excess of its dose or permissible exposure limit (PEL),
  - 2.14.5 Any other atmospheric condition that is immediately dangerous to life or health.
- 2.15 Hot Work Permit: the written authorization to perform operations (welding, cutting, heating, etc.) capable of providing a source of ignition.
- 2.16 Immediately Dangerous to Life or Health (IDLH): any condition that poses an immediate or delayed threat to life or that would cause irreversible adverse health effects or that would interfere with an individual's ability to escape unaided from a permit space.
- 2.17 Isolation: process by which a permit space is removed from service and completely protected against the release of energy and material into the space by such means as: blanking or blinding, misaligning or removing sections of lines, pipes or ducts, a double block and bleed system, lockout or tagout of all sources of energy, blocking or disconnecting mechanical linkages.
- 2.18 Local Emergency Services: local services for Campbell County such as ambulance, fire department or hazmat team.
- 2.19 On-Site Coordinator: is an Owner employee assigned by the Owner's facility manager as the primary point of contact for the Contractor following the issuance of a contract. The On-site Coordinator will coordinate the Contractor's activities at the jobsite.
- 2.20 Operating Authority: the Supervisory Staff in the Operation Section is the "Operating Authority" in the power plant and the administrator of this Confined Space Program. Operating Authority duties may also be assigned to the Lead Station Operator.
- 2.21 Permit-Required Confined Space: a confined space that has one or more of the following characteristics:
- 2.21.1 Contains, or has the potential to contain, a hazardous atmosphere.
  - 2.21.2 Contains a material that has the potential for engulfing an entrant.



# Dry Fork Station Procedure

Subject	Procedure No.	Revision No.	Page
Confined Space Program	01-SP-002	J	4

- 2.21.3 Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor that slopes downward and tapers to a smaller cross-section; or
- 2.21.4 Contains any other recognized serious safety or health hazard.
- 2.22 Permit Duration: required time duration allotted for the scope of work and this is located on the confined space permit.
- 2.23 Prohibited Condition: any condition in a permit space that is not allowed by the permit during the period when entry is authorized.
- 2.24 Rescue Services: this can be the emergency response team, contracted rescue team and/or local emergency services.
- 2.25 Retrieval Line: a self-retracting lifeline or rope attached at the center of the entrant's back near shoulder level, above the entrant's head or at another point which presents a profile small enough for successful removal of an entrant in a non-entry rescue.
- 2.26 Retrieval System: the equipment (retrieval line, chest or full-body harness, wristlets, and a lifting device or anchor) used for non-entry rescue of persons from permit confined spaces. If fall protection is required than employees are to follow Fall Protection Procedures.
- 2.27 Qualified Employee: a qualified employee is an individual that has been trained on and understands their responsibilities under the Confined Space Program.
- 2.28 Serious Safety or Health Hazard: does the hazard present physical harm or death?
- 2.29 Site Rescue Plan: a rescue plan developed by the Emergency Response Team and/or contracted rescue team to be utilized with the corresponding permit required confined space.
- 2.30 Supervisory Authority: the Plant Manager is the "Supervisory Authority" of this Confined Space Program and administers manning the installation, maintenance, and the operations of the procedure. This person may designate this authority if necessary.
- 2.31 Tag Line: a rope, self-retracting lifeline, or anything similar attached to an entrant in a confined space in order to aid rescuers in locating the entrant.
- 2.32 Ventilation: consists of natural draft air or mechanical means (i.e., fans, blowers, etc.).



# Dry Fork Station Procedure

<b>Subject</b> Confined Space Program	<b>Procedure No.</b> 01-SP-002	<b>Revision No.</b> J	<b>Page</b> 5
--	-----------------------------------	--------------------------	------------------

## 3.0 APPLICABILITY / RESPONSIBILITIES:

### 3.1 Applicability

3.1.1 This program applies to all employees, contractors, and the confined spaces within the boundary limits of BEPC facilities. Adherence to the policies and directives in this program is mandatory for all BEPC employees. Employees failing to follow this program are subject to disciplinary action up to and including termination of employment.

3.1.2 This program applies to the BEPC TSM division when the work conducted involves equipment that is attached to the facility. TSM employees will obtain permits from the facility's Operating Authority.

### 3.2 Responsibilities

3.2.1 Safety Coordinator is responsible for:

3.2.1.1 Evaluating the station on an ongoing basis for confined space entry. A list of permit-required confined spaces shall be maintained by the Safety Coordinator.

3.2.1.2 Providing assistance to the Entry Supervisors as required.

3.2.1.3 Ensuring initial and annual training is completed.

3.2.1.4 Maintaining all training records.

3.2.1.5 Ensuring periodic inspections are conducted.

3.2.2 Operating Authority is responsible for:

3.2.2.1 Initializing the confined space permit when requested by the authorized entrant and/or entry supervisor.

3.2.2.2 Summoning rescue services when an attendant or entry team member notifies the control room of an emergency situation.

3.2.2.3 Completing Clearance operations required by the Confined Space Permit.

3.2.3 Supervisory Authority is responsible for:

3.2.3.1 Safe administration of this Confined Space Program.

3.2.3.2 Designating the roles of responsibility for which individuals are qualified and entered into the Confined Space Program.



# Dry Fork Station Procedure

Subject	Procedure No.	Revision No.	Page
Confined Space Program	01-SP-002	J	6

- 3.2.3.3 Enforcing the Confined Space Program and the disciplinary actions regarding violations of the program.
- 3.2.4 Supervisors are responsible for:
  - 3.2.4.1 Evaluating the station on an ongoing basis for confined space entry.
  - 3.2.4.2 Ensuring that Entrants are trained for confined space entry.
  - 3.2.4.3 Enforcing the Confined Space Program and the disciplinary actions regarding violations of the program.
  - 3.2.4.4 Periodically inspecting the job site.
- 3.2.5 Entry Supervisors are responsible for:
  - 3.2.5.1 Ensuring that employees know their responsibilities as Authorized Entrants and Attendants in confined space entry.
  - 3.2.5.2 Terminating entry to the confined space when the operations requiring the permit are complete or when an unauthorized situation arises in or around the confined space area.
  - 3.2.5.3 Signing the Confined Space Entry Permit when entry conditions are met.
  - 3.2.5.4 Declassifying the confined space and documenting on the permit.
  - 3.2.5.5 Ensuring that a site rescue plan has been developed and the Emergency Response Team and/or contracted rescue team has been notified before authorizing entry.
  - 3.2.5.6 Ensuring all entrants have donned a full body harness prior to and for the duration of entry.
  - 3.2.5.7 Ensuring that all entrants have exited the confined space before closing the permit.
- 3.2.6 Authorized Entrants are responsible for:
  - 3.2.6.1 Knowing the hazards of a permit-required confined space including information on signs, symptoms, and consequences of exposure.
  - 3.2.6.2 Knowing how to use:
    - 3.2.6.2.1 Testing and monitoring equipment that may be required.



# Dry Fork Station Procedure

Subject	Procedure No.	Revision No.	Page
Confined Space Program	01-SP-002	J	7

- 3.2.6.2.2 Ventilation equipment that may be required to obtain acceptable entry conditions.
- 3.2.6.2.3 Communications equipment.
- 3.2.6.2.4 Personal protective equipment.
- 3.2.6.2.5 Other equipment that may be required for safe entry into or retrieval from a confined space.
- 3.2.6.3 Knowing how to communicate with an Attendant, if one is required, to enable the Attendant to monitor the entry and inform the Authorized Entrants if evacuation is necessary.
- 3.2.6.4 They must also alert an Attendant if a:
  - 3.2.6.4.1 Sign or symptom of exposure is detected.
  - 3.2.6.4.2 Prohibited condition is detected.
- 3.2.6.5 Inspecting and wearing proper personal protective equipment required for entry per confined space conditions.
- 3.2.6.6 Wearing a full body harness prior to entry and for the duration of entry.
- 3.2.6.7 Knowing how to exit the confined space if:
  - 3.2.6.7.1 An order is given to evacuate.
  - 3.2.6.7.2 A sign or symptom of exposure is detected.
  - 3.2.6.7.3 A prohibited condition is detected.
  - 3.2.6.7.4 The emergency alarm is sounded.
- 3.2.7 Attendants are responsible for:
  - 3.2.7.1 Knowing the hazards of a permit-required confined space, including information on signs, symptoms, and consequences of exposure.
  - 3.2.7.2 Knowing the possible behavioral effects of the hazard to Authorized Entrants.
  - 3.2.7.3 Continuously maintaining an accurate count of Authorized Entrants in the confined space and ensuring that the number matches the entry permit.



# Dry Fork Station Procedure

Subject	Procedure No.	Revision No.	Page
Confined Space Program	01-SP-002	J	8

- 3.2.7.4 Communicating with the Authorized Entrants to monitor entrant status and determine the need for evacuation.
- 3.2.7.5 Possessing means to maintain communication with the Control Room and Authorized Entrants.
- 3.2.7.6 Ensuring all entrants have donned a full body harness prior to and for the duration of entry.
- 3.2.7.7 Ordering the evacuation of the permit space if:
  - 3.2.7.7.1 A prohibited condition is detected.
  - 3.2.7.7.2 Behavioral effects of exposure to the hazard are detected in the Authorized Entrants.
  - 3.2.7.7.3 The attendant detects a situation outside the confined space that could endanger the Authorized Entrants.
  - 3.2.7.7.4 The attendant can no longer effectively and safely perform their duties.
- 3.2.7.8 When unauthorized persons approach, the Attendant must:
  - 3.2.7.8.1 Warn them away from the confined space.
  - 3.2.7.8.2 Advise the Authorized Entrants and Entry Supervisor if unauthorized persons have entered the confined space.
  - 3.2.7.8.3 Advise unauthorized entrants that they must exit immediately.
- 3.2.7.9 Contacting the Control Room as soon as the Attendant determines that Authorized Entrants may need assistance to escape from permit space hazards.
- 3.2.7.10 Performing non-entry rescues when required. Attendants are prohibited from entering confined spaces to perform retrieval operations.
- 3.2.7.11 Performing no other duties that might interfere with the Attendant's primary duty to monitor and protect the Authorized Entrants. (i.e., cell phone use)





# Dry Fork Station Procedure

<b>Subject</b> Confined Space Program	<b>Procedure No.</b> 01-SP-002	<b>Revision No.</b> J	<b>Page</b> 9
--	-----------------------------------	--------------------------	------------------

3.2.8 Contractors are responsible for:

- 3.2.8.1 Following and complying with the procedures outlined in this program at a minimum.
- 3.2.8.2 Training contract employees per OSHA 1910.146 and the BEPC Confined Space Program.
- 3.2.8.3 Providing training records of employees prior to initial entry.
- 3.2.8.4 Coordinating all confined space entries with the On-Site Coordinator and/or Operating Authority.
- 3.2.8.5 Providing an Attendant for permit required confined spaces.
- 3.2.8.6 Providing a rescue plan for confined space entry.
- 3.2.8.7 Ensuring contract employees are trained and aware of the rescue plan.
- 3.2.8.8 Providing personal protective, communication and rescue equipment and rescue personnel for individuals working within a confined space, unless otherwise specified in the contract.

3.2.9 Visitors are responsible for:

- 3.2.9.1 Visitors must be escorted at all times within a confined space, by a designated BEPC-DFS employee.

## 4.0 PROCEDURES / GUIDELINES

### 4.1 Guidelines

- 4.1.1 All confined spaces will be considered Permit-Required Confined Spaces until atmospheric checks have been completed and hazards have been removed.
- 4.1.2 A Permit-Required Confined Space may be declassified by removing the hazards of the space so that the characteristics of Section 2.21 no longer apply and as long as:
  - 4.1.2.1 The facility has historical experience with the confined space that all of the identified hazards have been eliminated. Those confined spaces that the facility has experience with can be obtained from the Safety Coordinator or Operating Authority.
  - 4.1.2.2 The confined space is continuously ventilated with fresh air.



# Dry Fork Station Procedure

Subject	Procedure No.	Revision No.	Page
Confined Space Program	01-SP-002	J	10

- 4.1.3 Confined space entry permits must be signed and dated by the Entry Supervisor. An Attendant's signature is required for permit required spaces.
- 4.1.4 No confined space will be entered unless a Confined Space Entry Permit has been initiated, properly completed, and authorized by the Entry Supervisor.
- 4.1.5 A confined space permit will be maintained for all confined space entry in order to maintain an accurate count of Authorized Entrants.
- 4.1.6 Hot Work Permits must be attached to the confined space permit if Hot Work Activities occur during entry.
- 4.1.7 Confined spaces will be ventilated for a minimum of 30 minutes prior to initial entry and for the duration of entry.
- 4.1.8 Authorized entrants shall wear a full body harness in all confined spaces.
- 4.2 Procedures
  - 4.2.1 Permit Required Confined Spaces are listed in Attachment 1.
  - 4.2.2 Prior to any confined space entry, the emergency response team and/or the contracted rescue team shall be notified to ensure site rescue plans are in place for the space.
  - 4.2.3 If a plan has not been developed, the emergency response team and/or the contracted rescue team shall create one before any entry is authorized into the space.
  - 4.2.4 Pre-Job Briefing
    - 4.2.4.1 Prior to entry into any confined space a pre-job briefing shall be held with the entry team and emergency responders and/or contracted rescue team.
    - 4.2.4.2 The entry team, emergency responders and/or contracted rescue team shall review:
      - 4.2.4.2.1 The hazards of the confined space.
      - 4.2.4.2.2 The site rescue plan.
      - 4.2.4.2.3 The entry permit.
      - 4.2.4.2.4 The work to be completed.
      - 4.2.4.2.5 The roles and responsibilities of all involved.



# Dry Fork Station Procedure

Subject	Procedure No.	Revision No.	Page
Confined Space Program	01-SP-002	J	11

4.2.4.2.6 The Job Safety Analysis (JSA) for the space and work involved.

4.2.4.3 The site rescue plan and JSA shall be attached to the entry permit once reviewed.

4.2.4.4 A job briefing shall be held at every shift change prior to entry and anytime there is a change to the space or work involved.

## 4.2.5 Permit Required Confined Space Entry Procedure

4.2.5.1 Authorized Entrants or Entry Supervisor requiring entry into a confined space will initiate entry through the Operating Authority by requesting a permit and discussing Clearance Requirements.

4.2.5.2 Permits will cover the length of time required for the original maintenance or service crew to complete the job and will not exceed twelve (12) hours or one shift. When confined space entries extend beyond the 12 hours or shift change, the relieving shift or crew will follow the confined space procedure and have a new permit issued.

4.2.5.3 The Operating Authority will print the entry permit for the space requested. If the computer is nonfunctional, a blank entry form will be manually completed. (See Attachment 2.)

4.2.5.4 The Entry Team will check out an air monitor from the Operating Authority. The Operating Authority will fill out the appropriate block for the monitor checked out in the Air Monitor Checkout Log indicating the date and employee's/contractor's name. Once the monitor is turned back in, the Operating Authority will document this in the Air Monitor Checkout Log.

4.2.5.5 Before authorizing entry, the Entry Supervisor and Entry Team will ensure that:

4.2.5.5.1 DFS Clearance and isolation procedures have been completed for the permit space, if applicable.

4.2.5.5.2 Atmospheric checks have been completed, recorded, and meet the following applicable criteria:

4.2.5.5.2.1 Oxygen content between 19.5% and 23.5%.

4.2.5.5.2.2 Flammable gases and/or vapors less than 10% of the lower explosive limit (LEL).



# Dry Fork Station Procedure

Subject	Procedure No.	Revision No.	Page
Confined Space Program	01-SP-002	J	12

4.2.5.5.2.3 Carbon Monoxide < 35 PPM

4.2.5.5.2.4 Sulfur Dioxide < 2 PPM

4.2.5.5.2.5 Hydrogen Sulfide < 10 PPM

4.2.5.5.2.6 Ammonia < 25 PPM

4.2.5.5.2.7 Other Toxic chemicals as per the Safety Data Sheet.

4.2.5.5.3 The atmosphere will be continuously monitored, and atmospheric checks will be documented on the permit each day prior to entry and every three hours thereafter at a minimum. Authorized Entrants, Attendant and/or Entry Supervisors may perform and/or observe all atmospheric tests.

4.2.5.5.4 When monitoring for entries involved in descent into atmospheres that may be stratified, the atmospheric envelope should be tested a distance of approximately 4 feet in the direction of travel and to each side.

4.2.5.5.5 It is recommended that continuous air monitoring occur while hot work activities are being performed within a confined space. Personal monitors are available for employees to wear.

4.2.5.5.6 Determine, if applicable, that the area has been cleared of all hazards.

4.2.5.5.7 Proper barriers are in place to protect authorized entrants from external hazards before authorizing entry.

4.2.5.5.8 An Attendant is posted and will remain on duty until Authorized Entrants have exited the space.

4.2.5.5.9 In areas deemed necessary by the Entry Supervisor, the point of entry must be chained and locked in the open position to prevent accidental closure.

4.2.5.5.10 All Authorized Entrants are wearing a full body harness.

4.2.5.6 The Confined Space Entry Permit will be at the entry point and Authorized Entrants will sign in and out each time the space is entered and exited.



# Dry Fork Station Procedure

Subject	Procedure No.	Revision No.	Page
Confined Space Program	01-SP-002	J	13

- 4.2.5.7 Each time the permit space is completely vacated; an Attendant will secure the permit at the space in an identified container (i.e., metal binder) that notifies any passersby of space requirements. No entry is allowed until an Attendant has returned.
  - 4.2.5.8 All Entrants will immediately evacuate the confined space if any signs or symptoms of exposure develop, or any changes occur that make the confined space unsafe.
  - 4.2.5.9 The Attendant will require evacuation of the confined space if noticeable behavior indicates that conditions are unsafe to continue work.
  - 4.2.5.10 Upon exiting, Authorized Entrants will sign out on the confined space permit.
  - 4.2.5.11 Attendant will remain on duty until all Authorized Entrants have exited the space, close out the permit and return the Confined Space Entry Permit to the Entry Supervisor.
  - 4.2.5.12 The Entry Supervisor will ensure that all Authorized Entrants have exited the space, close out the permit and return it to the Operating Authority.
  - 4.2.5.13 Before closing the permit in the computer system, the Operating Authority will ensure that all Entrants are signed out of the space, the attendant and entry supervisor have closed out the permit and the permit is properly completed.
- 4.2.6 Declassification of Confined Spaces
- 4.2.6.1 A Permit-Required Confined Space may be declassified by removing the hazards of the space so that the characteristics of Section 2.21 no longer apply.
    - 4.2.6.1.1 Atmospheric hazards are controlled by continuous ventilation removes this hazard.
    - 4.2.6.1.2 Emptying the confined space of any material capable of engulfment of an entrant removes this hazard.
    - 4.2.6.1.3 Changing the internal configuration of a confined space through the use of platforms or scaffolding so that the internal configuration is safe, removes this hazard.



# Dry Fork Station Procedure

Subject	Procedure No.	Revision No.	Page
Confined Space Program	01-SP-002	J	14

- 4.2.6.1.4 Removal of any other serious safety hazard through a means approved by the Entry Supervisor, removes this hazard.
- 4.2.6.1.5 All confined space declassifications will be documented on the Confined Space Permit (Attachment 2).
- 4.2.6.2 Once declassified, the permit duration will be determined by the Entry Team and documented by the Entry Supervisor on the permit under the declassification section.
- 4.2.6.3 Atmospheric checks shall be taken and documented initially, and each shift prior provided the job being performed does not create a prohibited condition. Continuous monitoring may be completed at the discretion of the Entry Team and is recommended while hot work activities are being performed Authorized Entrants and/or Entry Supervisors may perform and/or observe all atmospheric tests.
- 4.2.6.4 An Attendant is not required, but a minimum of two (2) employees is required for entry.
- 4.2.6.5 The Confined Space Entry Permit will be at the entry point and Authorized Entrants will sign in and out each time the space is entered and exited.
- 4.2.6.6 Each time the permit space is completely vacated; an Authorized Entrant will secure the permit at the space in an identified container (i.e., metal binder) that notifies any passersby of space requirements.
- 4.2.6.7 When work inside a declassified area is complete or the end of permit duration:
  - 4.2.6.7.1 Authorized Entrants will sign out on the Confined Space Permit.
  - 4.2.6.7.2 The Entry Supervisor will ensure that all Authorized Entrants have exited the space and close out the permit. The Entry Supervisor will return it to the Operating Authority.
- 4.2.6.8 Before closing the permit in the computer system, the Operating Authority will ensure that all Entrants are signed out of the space, the entry supervisor has closed out the permit and the permit is properly completed.



# Dry Fork Station Procedure

Subject	Procedure No.	Revision No.	Page
Confined Space Program	01-SP-002	J	15

4.2.6.9 Declassified Confined Spaces may be reclassified as Permit-Required Confined Spaces if, during the course of entry, a prohibited condition is expected or discovered.

4.2.6.10 If a prohibited condition is expected or discovered, all Entrants must evacuate the space, Entry Supervisor notified, and the space must be re-evaluated, and a new permit issued before authorization of entry.

## 4.2.7 Rescue from Confined Spaces

4.2.7.1 The contracted rescue team (when applicable and by contract) shall have members stationed in the control room.

4.2.7.2 The Emergency Response Team and/or contracted rescue team shall be notified of confined space entry by the Entry Supervisor to ensure a site rescue plan has been developed and for personnel availability. (Reference Section 4.2.4)

4.2.7.3 Depending on the entry application, a tag line may be requested/recommended by the rescue team. There may also be situations where a tag line or retrieval line is required. This determination will be based on entry and the configuration of the confined space and shall be documented on the permit and rescue plan.

4.2.7.4 As part of pre-job planning, a plan for rescuing employees involved in a confined space shall be discussed and necessary equipment required for this task shall be made readily available or staged depending on the site rescue plan requirements.

4.2.7.5 If a rescue is needed, employees must follow the site rescue plan for the space and the Emergency Action Plan for further assistance.

4.2.7.6 Entry team members shall contact the control room when an emergency situation arises and have the emergency response team dispatched.

4.2.7.7 Retrieval from outside the space should be attempted provided it will not cause additional injury to the employee. Entry into the space to provide first aid treatment will not be attempted by the attendant or any other untrained team members.

4.2.7.8 The Operating Authority, Safety Coordinator or Plant Manger shall call Local Emergency Services when there is a need for additional services due to the nature of the incident and personnel involved. This shall be determined by the Operating Authority, Emergency Response



# Dry Fork Station Procedure

<b>Subject</b> Confined Space Program	<b>Procedure No.</b> 01-SP-002	<b>Revision No.</b> J	<b>Page</b> 16
--	-----------------------------------	--------------------------	-------------------

Team and/or contracted rescue team and communicated to the control room.

## 4.2.8 Hot Work

4.2.8.1 A Hot Work Permit will be required in or on the exterior surfaces of an occupied confined space during electric or gas welding, cutting, brazing, burning or similar flame or spark producing operations and open flames if any of the following exist:

4.2.8.1.1 When a confined space or a space adjacent to a confined space has contained a flammable or combustible substance unless those spaces have been adequately cleaned.

4.2.8.1.2 In a confined space having last contained dry material that creates an explosive atmosphere unless the space has been adequately cleaned.

4.2.8.1.3 When fixed fire extinguishing systems within a confined space are isolated.

4.2.8.1.4 When work involves a classified system. Reference the DFS Hot Work Program for a list of classified systems.

4.2.8.1.5 Additional requirements may be found in facility Hot Work Programs.

4.2.8.2 If a hot work permit is required with a confined space permit, both permits shall be maintained together.

4.2.8.3 The following precautions must be taken when performing hot work in or on confined spaces:

4.2.8.3.1 Follow all required precautions listed on the hot work permit.

4.2.8.3.2 Ensure that the confined space and all associated piping are isolated, purged of flammable vapors, vented and the LEL is 0% and monitored as per this program.

4.2.8.3.3 Ensure the space is cleaned of all combustible dusts and/or liquids.

4.2.8.3.4 When welding or cutting will be performed on a tank shell or an exterior surface of a confined space, the same precautions shall be exercised inside and outside the





# Dry Fork Station Procedure

Subject	Procedure No.	Revision No.	Page
Confined Space Program	01-SP-002	J	17

space as sparks from direct penetration or heat transfer may also create an explosion or fire hazard in the adjacent spaces outside the confined space.

- 4.2.8.3.5 Before hot work is started on a coated surface, coating that may be flammable should be stripped from the surface.
- 4.2.8.4 When arc welding, gas welding or cutting is suspended for a substantial period of time, such as during lunch periods or overnight:
  - 4.2.8.4.1 For arc welding the power source to the equipment shall be de-energized, all electrodes removed from holders, and the holders placed so that accidental contact or arcing cannot occur.
  - 4.2.8.4.2 For gas welding or cutting, either remove the torch and hoses from the area and depressurize outside the confined space or shut the bottles off and disconnect the hoses.
- 4.2.8.5 No compressed gas cylinders or associated manifold, other than those used for SCBA's and fire extinguishers shall be located inside the confined space without approval of the Entry Supervisor.
- 4.2.8.6 The use of a fire extinguisher requires evacuation of the space and re-evaluation before re-entry can occur.
- 4.2.9 Contractors [OSHA 1910.146(c)(8)]
  - 4.2.9.1 Contractors will follow the Dry Fork Station Confined Space Program at a minimum.
  - 4.2.9.2 Contractors will be informed by their On-Site Coordinator that confined spaces are present at the facility. On-Site Coordinators will also discuss the hazards of the confined space to be entered with the contractors prior to entry.
  - 4.2.9.3 Each Authorized Entrant must follow the DFS Clearance Program prior to entry.
  - 4.2.9.4 Contractors must coordinate confined space entry with their On-Site Coordinator and the Operating Authority.
  - 4.2.9.5 If multiple work groups are working in the same confined space, a pre-job meeting shall be held with all Entry Teams to discuss the classification of the space prior to entry. The teams must agree on the classification if entered simultaneously.



# Dry Fork Station Procedure

Subject	Procedure No.	Revision No.	Page
Confined Space Program	01-SP-002	J	18

- 4.2.9.6 Contractors are responsible for rescue operations of their employees unless otherwise specified in the contract.
- 4.2.9.7 Contractors must ensure their employees are aware of the site rescue plan, have been trained on the plan and know how to execute the plan if warranted.
- 4.2.9.8 Contractors must follow the DFS Emergency Action Plan if a situation arises.
- 4.2.9.9 At the conclusion of entry operations, a lead person/foreman or the Entry Supervisor will meet with the On-Site Coordinator and debrief on the entry. This debriefing will include: any hazards confronted or created in the space and any other issues that were encountered.

## 4.2.10 Training

- 4.2.10.1 Training will be provided to all employees whose work may be regulated by these procedures. Understanding the responsibilities and procedures outlined above will be the primary objective of the training.
- 4.2.10.2 Training may include but is not limited to potential hazards, signs of danger, safe work practices, communication methods, and entry and rescue procedures.
- 4.2.10.3 Training will be provided:
  - 4.2.10.3.1 Before the employee is first assigned duties covered by this procedure.
  - 4.2.10.3.2 Before there is a change in assigned duties.
  - 4.2.10.3.3 Whenever there is a change in confined space operations that presents a hazard about which the employee has not previously been trained.
  - 4.2.10.3.4 Whenever there is a deviation from the work scope or there are inadequacies in the employee's knowledge.
- 4.2.10.4 The training will establish employee proficiency in the duties required by these procedures and will introduce new or revised procedures as necessary for compliance with these procedures.
- 4.2.10.5 Refresher training in these procedures will be conducted on an annual basis.



# Dry Fork Station Procedure

Subject	Procedure No.	Revision No.	Page
Confined Space Program	01-SP-002	J	19

4.2.10.6 Employees designated to provide rescue and emergency services must practice making permit space rescues at least once every 12 months, by means of simulated rescue operations in which they remove dummies, manikins, or actual persons from the actual permit space or from representative spaces.

## 4.2.11 Recordkeeping

4.2.11.1 A record of training shall be maintained in the training files and in accordance with BEPC Safety Record Retention Plan.

4.2.11.2 All completed/cancelled permits must be retained on file for at least one year. Files can be accessed by contacting an Administrative Assistant or Safety Coordinator and are located in the facility file system.

4.2.11.3 Cancelled/Completed entry permits, and the Confined Space Entry Program will be reviewed at least annually and revised as necessary. All additional copies of the Confined Space Entry Permits must be attached to originals when submitted for review.

## 5.0 ATTACHMENTS

5.1 Attachment 1: List of Permit-Required Confined Spaces

5.2 Attachment 2: Confined Space Entry Permit

Link: <http://hdq1139.bepc.net/adm//links.aspx?id=Library.7D7F550A-28C9-49BF-92A7-58309FEB70B5>

5.3 Attachment 3: Signs & Symptoms of Exposure

5.4 Attachment 4: Confined Space On-Site Rescue Plan Form SAF-6083

Link: <http://hdq1139.bepc.net/adm/doc.aspx?id=Library.C0725834-249C-41A8-902D-E2E9ED74C352>

## 6.0 REFERENCES

6.1 OSHA 29 CFR 1910.146; Permit-Required Confined Spaces.

6.2 OSHA 29 CFR 1910.252(a)(4)(i-ii); Fire Prevention and Protection

6.3 OSHA 29 CFR 1910.269(e); Electrical Power Generation, Transmission and Distribution, Enclosed Spaces.

6.4 OSHA 29 CFR 1910.252(c)(4)(i-v); Ventilation

6.5 01-SP-001 Dry Fork Station Clearance Program



# Dry Fork Station Procedure

<b>Subject</b>	<b>Procedure No.</b>	<b>Revision No.</b>	<b>Page</b>
Confined Space Program	<b>01-SP-002</b>	J	20

- 6.6 00-SP-027 Dry Fork Station Energy Verification and Control Program
- 6.7 00-SP-008 Dry Fork Station Emergency Action Plan
- 6.8 00-SP-005 Dry Fork Station Hot Work Program
- 6.9 00-SP-038 DFS Portable Gas Monitors Procedure



# Dry Fork Station Procedure

<b>Subject</b> Confined Space Program	<b>Procedure No.</b> 01-SP-002	<b>Revision No.</b> J	<b>Page</b> 21
--	-----------------------------------	--------------------------	-------------------

Attachment 1

## LIST OF PERMIT-REQUIRED CONFINED SPACES

Location & Elevation	Number of Confined Space Entrances
<a href="#">Waste Water Cooling Tower Pumphouse</a>	3
<a href="#">Water Treatment Building</a>	11
<a href="#">Well 2 Line</a>	9
<a href="#">AQCS 4417</a>	1
<a href="#">AQCS 4387</a>	14
<a href="#">AQCS 4342</a>	20
<a href="#">AQCS 4324</a>	7
<a href="#">AQCS 4305</a>	8
<a href="#">AQCS 4294</a>	8
<a href="#">AQCS 4284</a>	4
<a href="#">AQCS 4272</a>	2
<a href="#">AQCS 4263</a>	2
<a href="#">AQCS 4249</a>	10
<a href="#">Boiler Building 4477</a>	8
<a href="#">Boiler Building 4461</a>	8
<a href="#">Tripper Area</a>	10
<a href="#">Boiler Building 4422</a>	18
<a href="#">Boiler Building 4412</a>	8
<a href="#">Boiler Building 4391-4397</a>	13
<a href="#">Boiler Building 4379</a>	9
<a href="#">Boiler Building 4360-4369</a>	2
<a href="#">Boiler Building 4349</a>	16
<a href="#">Boiler Building 4316</a>	4
<a href="#">Boiler Building 4304</a>	4
<a href="#">Boiler Building 4294</a>	5
<a href="#">Boiler Building 4275</a>	10
<a href="#">Ammonia Storage Tanks</a>	2
<a href="#">Propane Storage Tanks</a>	3
<a href="#">Service Water Tank</a>	4
<a href="#">Hydrogen Tank</a>	1
<a href="#">Storm Water - Oily Water</a>	53
<a href="#">ACC Main Steam Duct</a>	5
<a href="#">Clean Gas Duct</a>	2
<a href="#">Ash Silo</a>	2
<a href="#">Cable Vaults</a>	36
<a href="#">Lime Silo</a>	3
<a href="#">CO2 Fire Supression Tank</a>	1
<a href="#">Activated Carbon Injection Tank</a>	1
<a href="#">Power Block 4276 - Mezzanine</a>	9
<a href="#">Power Block 4249 - Ground Floor</a>	72
<a href="#">Turbine Building 4379</a>	3



# Dry Fork Station Procedure

<b>Subject</b> Confined Space Program	<b>Procedure No.</b> 01-SP-002	<b>Revision No.</b> J	<b>Page</b> 22
--	-----------------------------------	--------------------------	-------------------

<a href="#">Turbine Building 4359</a>	2
<a href="#">Turbine Building 4339</a>	1
<a href="#">Turbine Building 4319</a>	1
<a href="#">Turbine Deck - Power Block 4299</a>	16

Click the Hyperlinks above and it will bring you to an Excel Spreadsheet that contains the access type, location, picture, number of entrance points and a layout drawing. The hyperlinks may take some time to open so be patient.

The tabs at the bottom correspond to the elevations listed above. Make sure that the correct tab is selected. An example is below:

The screenshot shows the Microsoft Excel interface with the following data in the spreadsheet:

Date	Access Type	Location	Picture (Double Click To Enlarge)	Number
Number of Confined Space Entrances: 18				
07/12/2010	Hatch	At Ground Level Below Fifth Sootblower From the West on the North Set of Sootblowers		1
07/12/2010	Hatch	At Ground Level to the East of The Fifth Sootblower From the West (North Set of Sootblowers)		2
07/12/2010	Hatch	Located High Up From Grating - Between the Fifth and Sixth Sootblower From the West (North Set of Sootblowers)		3
07/12/2010	Hatch	Located High Up From Grating - Below the Sixth Sootblower From the West (North Set of Sootblowers)		4
07/12/2010	Hatch	Located High Up From Grating - West of Seventh Sootblower From the West (North Set of Sootblowers)		5
07/12/2010	Hatch	Located at Grating Level - West of Third Sootblower From the East (North Set of Sootblowers)		6
07/12/2010	Hatch	Located High Up From Grating - West of Third Sootblower From the East (North Set of Sootblowers)		7
07/12/2010	Hatch	Located at Grating Level - West of First Sootblower From the East (North Set of Sootblowers)		8
07/12/2010	Hatch	Located High Up From Grating - West of First Sootblower From the East (North Set of Sootblowers)		9
07/12/2010	Hatch	Located at Grating Level - West of First Sootblower From the		10



# Dry Fork Station Procedure

<b>Subject</b> Confined Space Program	<b>Procedure No.</b> 01-SP-002	<b>Revision No.</b> J	<b>Page</b> 23
--	-----------------------------------	--------------------------	-------------------

Attachment 2

## CONFINED SPACE ENTRY PERMIT

	<b>Basin Electric Power Cooperative DRY FORK STATION Confined Space Entry Permit</b>	Permit #: Issued By:
Location/Building:	Clearance Form No.	
Name of Confined Space To Be Entered:	Date:	Duration of Permit To:
Confined Space Entry Point:	Time:	To:
Company Performing the Work:	<input type="checkbox"/> Declassified Space See declassification section for extended duration (when applicable)	
Reason For Entry (Describe Work To Be Done):	Other Permits Required <input type="checkbox"/> Hot Work <input type="checkbox"/> Other _____	
<b>POTENTIAL CONFINED SPACE HAZARDS (CHECK ALL THAT APPLY)</b>		
<input type="checkbox"/> Oxygen Hazard (<19.5% or 23.5%)	<input type="checkbox"/> Overhead Hazards (Ash, Clinkers)	<input type="checkbox"/> Engulfment
<input type="checkbox"/> Flammable Gas/Vapors (>10%LEL)	<input type="checkbox"/> Mechanical Hazards	<input type="checkbox"/> Welding/ Cutting
<input type="checkbox"/> Toxic Gases or Vapors (CO, NH3, H2S, SO2)	<input type="checkbox"/> Electrical Hazards	<input type="checkbox"/> Other
<input type="checkbox"/> Chemical(s): _____	<input type="checkbox"/> High Temperatures >105 Degrees F _____	
Hazard Comments/Notes:		
<b>PREPARATION FOR ENTRY (INITIAL AFTER STEPS HAVE BEEN COMPLETED)</b>		
_____ Affected Dept. Notified of Service Interruption	_____ Clearance & Tagging Complete	
_____ Cleaning, Flushing, Rinsing Complete	_____ Type of Air Mover/Ventilation Used _____	
_____ Atmospheric Testing Completed/Recorded	_____ Space Ventilated for _____ Hours (minimum 30 min.)	
_____ Communication To Be Used Between Attendants and Entrants (Circle One): Voice – Radio - Signaling System	_____ Temperature _____ Degrees F	
_____ Emergency - Call Main Control Room By (Circle One): Gai-Tronics, Radio Channel _____, Phone # _____		
_____ Pre-Entry Briefing / Review of Clearance Boundaries, JSA and Entry Team Responsibilities		
_____ Space To Be Ventilated During Entry? (Circle One) YES or NO		
_____ How Is Space To Be Ventilated? _____		
_____ Site Rescue Plan Attached and Emergency Response Team And/or Contracted Rescue Team Notified		
<b>REQUIRED PROTECTIVE EQUIPMENT</b>		
<input type="checkbox"/> Half Mask or Full Face Cartridge Respirator	<input type="checkbox"/> Protective Gloves	<input type="checkbox"/> Face Shield
<input type="checkbox"/> Breathing Air System or SCBA	<input type="checkbox"/> Rain Suit /Chemical Suit	<input type="checkbox"/> Fire Extinguisher
<input type="checkbox"/> Ground Fault Circuit Interrupter (GFCI)	<input type="checkbox"/> Goggles	<input type="checkbox"/> Hearing Protection
<input type="checkbox"/> Full Body Harness	<input type="checkbox"/> Rescue Tri-pod & Retrieval Winch	<input type="checkbox"/> Air Monitor (MX4 or MX6)
<input type="checkbox"/> Retrieval Line	<input type="checkbox"/> Artificial Light	<input type="checkbox"/> Other _____



# Dry Fork Station Procedure

<b>Subject</b> Confined Space Program	<b>Procedure No.</b> 01-SP-002	<b>Revision No.</b> J	<b>Page</b> 24
--	-----------------------------------	--------------------------	-------------------

GAS TEST RESULTS (Required Daily Prior To Entry, Every Shift and Every 3-Hours (permit-required))								
Date/Time		Initials		Date/Time		Initials		
<b>Gases</b>	Test Results			Test Results			Test Results	
O <sub>2</sub> % 19.5 – 23.5								
LEL % <10%								
CO PPM <35								
SO <sub>2</sub> PPM <2								
NH <sub>3</sub> <25								
H <sub>2</sub> S <10								
Other <PEL								

**Special Instructions:**

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**Entry Supervisor Authorization:** The work site has been inspected, all required precautions have been taken, necessary equipment is provided and it is safe to enter the Confined Space.

Entry Supervisor: \_\_\_\_\_ Employee # \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

Contract Supervisor: \_\_\_\_\_ Company # \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

Use additional lines if a new Entry Supervisor assumes authorization of the space:

Entry Supervisor: \_\_\_\_\_ Employee # \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

Entry Supervisor: \_\_\_\_\_ Employee # \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

Entry Supervisor: \_\_\_\_\_ Employee # \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

I have reviewed the Confined Space Entry Permit, understand Attendant responsibilities and inspected the work site.

Attendant: \_\_\_\_\_ Employee # \_\_\_\_\_ Date: \_\_\_\_\_ Time On: \_\_\_\_\_ Time Off: \_\_\_\_\_

(A signature is not required for Declassified Confined Spaces)

Use additional lines if a new Attendant assumes responsibility of the space:

Attendant: \_\_\_\_\_ Employee # \_\_\_\_\_ Date: \_\_\_\_\_ Time On: \_\_\_\_\_ Time Off: \_\_\_\_\_

Attendant: \_\_\_\_\_ Employee # \_\_\_\_\_ Date: \_\_\_\_\_ Time On: \_\_\_\_\_ Time Off: \_\_\_\_\_

Attendant: \_\_\_\_\_ Employee # \_\_\_\_\_ Date: \_\_\_\_\_ Time On: \_\_\_\_\_ Time Off: \_\_\_\_\_

Attendant: \_\_\_\_\_ Employee # \_\_\_\_\_ Date: \_\_\_\_\_ Time On: \_\_\_\_\_ Time Off: \_\_\_\_\_

Attendant: \_\_\_\_\_ Employee # \_\_\_\_\_ Date: \_\_\_\_\_ Time On: \_\_\_\_\_ Time Off: \_\_\_\_\_





# Dry Fork Station Procedure

<b>Subject</b> Confined Space Program	<b>Procedure No.</b> 01-SP-002	<b>Revision No.</b> J	<b>Page</b> 25
--	-----------------------------------	--------------------------	-------------------

### DECLASSIFICATION CHECKLIST

<input type="checkbox"/> Oxygen between 19.5% and 23.5%	<input type="checkbox"/> No Overhead Hazards	<input type="checkbox"/> No Engulfment or Entrapment Potential
<input type="checkbox"/> Flammable Gas/Vapors <10% LEL	<input type="checkbox"/> No Mechanical Hazards	<input type="checkbox"/> Self-Egress Available (ladder/scaffold)
<input type="checkbox"/> No Toxic Gases or Vapors above PEL	<input type="checkbox"/> No Electrical Hazards	<input type="checkbox"/> No Asphyxiation Hazard
<input type="checkbox"/> No other Chemical Hazards	<input type="checkbox"/> Temperature <105 Degrees F	<input type="checkbox"/> Other _____

### CERTIFICATION TO DECLASSIFY THE CONFINED SPACE FROM A PERMIT REQUIRED STATUS

I certify that the confined space does not contain a hazardous atmosphere; or material that may engulf an entrant; or has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly-converging walls or by a floor that slopes downward and tapers to a smaller cross-section; and the space does not contain any other recognized serious safety or health hazard.

**Entry Supervisor**

Printed Name	Signature	Employee #	Date	Time
_____	_____	_____	_____	_____

This certification shall be made available to each person entering the space or to that person's authorized representative. No Attendant(s) are required, however, each entry and exit, Entrants are required to sign onto and off of the Confined Space Entry Permit. The Confined Space Entry Permit shall be posted at the confined space entry point. Upon final exit, Entrants are required to remove the Confined Space Entry Permit and return it to the Operating Authority.

### **EXTENDED DURATION DUE TO DECLASSIFICATION STATUS**

Date: \_\_\_\_\_ To: \_\_\_\_\_

Time: \_\_\_\_\_ To: \_\_\_\_\_

### **CLOSE OUT OF CONFINED SPACE PERMIT**

All employees listed on this permit have exited the space, signed out and are clear of the equipment.

The Work Is Completed     The Work Is Not Complete

Attendant: \_\_\_\_\_ Employee # \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

Entry Supervisor: \_\_\_\_\_ Employee # \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

(Attendant signature not required for a Declassified Confined Space)

**THIS PERMIT MUST BE POSTED ON JOB SITE – GOOD ONLY ON INDICATED DATES**



# Dry Fork Station Procedure

<b>Subject</b> Confined Space Program	<b>Procedure No.</b> 01-SP-002	<b>Revision No.</b> J	<b>Page</b> 26
--	-----------------------------------	--------------------------	-------------------

## Supplemental Page to Record Gas Test Results

GAS TEST RESULTS (Required Daily Prior To Entry, Every Shift and Every 3-Hours (permit-required))							
Date/Time		Initials		Date/Time		Initials	
<b>Gases</b>	<b>Test Results</b>	<b>Test Results</b>	<b>Test Results</b>	<b>Test Results</b>	<b>Test Results</b>	<b>Test Results</b>	<b>Test Results</b>
O <sub>2</sub> % 19.5 – 23.5							
LEL % <10%							
CO PPM <35							
SO <sub>2</sub> PPM <2							
NH <sub>3</sub> <25							
H <sub>2</sub> S <10							
Other <PEL							

GAS TEST RESULTS (Required Daily Prior To Entry, Every Shift and Every 3-Hours (permit-required))							
Date/Time		Initials		Date/Time		Initials	
<b>Gases</b>	<b>Test Results</b>	<b>Test Results</b>	<b>Test Results</b>	<b>Test Results</b>	<b>Test Results</b>	<b>Test Results</b>	<b>Test Results</b>
O <sub>2</sub> % 19.5 – 23.5							
LEL % <10%							
CO PPM <35							
SO <sub>2</sub> PPM <2							
NH <sub>3</sub> <25							
H <sub>2</sub> S <10							
Other <PEL							





# Dry Fork Station Procedure

Subject	Procedure No.	Revision No.	Page
Confined Space Program	01-SP-002	J	28

## Attachment 3

## **SIGNS AND SYMPTOMS OF EXPOSURE**

### 1.0 Oxygen (O<sub>2</sub>) Levels

- 1.1 23.5 % Volume Maximum “Safe Level” – OSHA
- 1.2 21 % Normal Oxygen Concentration of Air (20.954%)
- 1.3 19.5 % Minimum “Safe Level” – OSHA, NIOSH
- 1.4 17 % Impairment of judgment starts to be detected.
- 1.5 16 % First signs of anoxia appears.
- 1.6 16 – 12 % Breathing and pulse rate increases, muscular co-ordination is slightly impaired.
- 1.7 14 – 10 % Consciousness continuous; emotional upsets, abnormal fatigue upon exertion, disturbed respiration.
- 1.8 10 – 6 % Nausea and vomiting, inability to move freely and loss of consciousness may occur.
- 1.9 < 6 % Convulsive movements and gasping respiration occurs; respiration stops and a few minutes later heart action ceases.

### 2.0 Carbon Monoxide (CO) Levels

- 2.1 50 PPM – OSHA PEL (8 hours) Low Alarm 35 PPM
- 2.2 200 PPM - Possible mild frontal headache in 2 to 3 hours.
- 2.3 400 PPM - Frontal headache and nausea after 1 to 2 hours.
- 2.4 800 PPM - Headache, dizziness, and nausea in 45 minutes. Collapse and possible death in 2 hours.
- 2.5 1600 PPM - Headache, dizziness, and nausea in 20 minutes. Collapse and death in 1 hour.
- 2.6 3200 PPM - Headache and dizziness in 5 to 10 minutes. Unconsciousness and danger of death in 30 minutes.
- 2.7 6400 PPM - Headache and dizziness in 1 to 2 minutes. Unconsciousness and danger of death in 10 to 15 minutes.
- 2.8 12,800 PPM - Immediate effects – unconsciousness. Danger of death in 1 to 3 minutes.



# Dry Fork Station Procedure

Subject	Procedure No.	Revision No.	Page
Confined Space Program	01-SP-002	J	29

## 3.0 Hydrogen Sulfide (H<sub>2</sub>S) Levels

- 3.1 0.13 PPM - Minimal perceptible odor.
- 3.2 4.60 PPM - Easily detected, moderate odor.
- 3.3 10 PPM - Beginning eye irritation. PEL - 8 hours (OSHA, ACGIH) Low Alarm.
- 3.4 27 PPM - Strong, unpleasant odor, but not intolerable.
- 3.5 100 PPM - Coughing, eye irritation, loss of sense of smell after 2 to 5 minutes.
- 3.6 200 – 300 PPM - Marked conjunctivitis (eye inflammation) and respiratory tract irritation after one hour of exposure.
- 3.7 500 - 700 PPM - Loss of consciousness, cessation (stopping or pausing) of respiration, and death.
- 3.8 1000 – 2000 PPM - Unconsciousness at once, with early cessation of respiration and death in a few minutes.  
Death may occur even if individual is removed to fresh air at once.

## 4.0 Sulfur Dioxide (SO<sub>2</sub>) Levels

- 4.1 0.3 – 1.0 PPM - Sulfur Dioxide initially detected by taste.
- 4.2 2 PPM - PEL (OSHA, ACGIH) Low Alarm.
- 4.3 3 PPM - Odor becomes easily detected.
- 4.4 6 – 12 PPM - Irritation of the nose and throat.
- 4.5 20 PPM - Irritation of the eyes.
- 4.6 50 – 100 PPM - Maximum exposure for a 30 minute period.
- 4.7 400 – 500 PPM - Dangerous concentration can cause edema of the lungs and glottis and death from prolonged exposure.

## 5.0 Chlorine (CL<sub>2</sub>) Levels

- 5.1 0.5 PPM - Permissible Exposure Level (OSHA, ACGIH) Low Alarm.
- 5.2 3.0 PPM - Irritation of the mucous membranes, eyes and respiratory tract.
- 5.3 3.5 PPM - Produces an easily detectable odor.



# Dry Fork Station Procedure

Subject	Procedure No.	Revision No.	Page
Confined Space Program	01-SP-002	J	30

5.4 15 PPM - Causes immediate irritation of the throat.

5.5 30 PPM - Maximum exposure for 30 minute period.

5.6 100 – 150 PPM - Pain, tightness in the chest, and death results from prolonged exposure.

## 6.0 Ammonia (NH<sub>3</sub>) Levels

6.1 0 – 25 PPM - Minor irritations of the eyes and respiratory tract.

6.2 25 PPM - PEL (NIOSH, ACGIH)

6.3 50 PPM – STEL (OSHA)

6.4 50 –100 PPM - Swelling of the eyelids, conjunctivitis, vomiting, irritation of the throat. STEL 50 PPM OSHA

6.5 100 – 500 PPM - Concentrations are dangerously high, irritation becomes more intense. Death can result from highly concentrated, prolonged exposure.







# 01-SP-002 Confined Space Program (J)

Final Audit Report

2024-01-16

Created:	2024-01-16
By:	Jean Fichter (JFichter@becp.com)
Status:	Signed
Transaction ID:	CBJCHBCAABAAIbEBbDxFrkxYYI6HmRbk359StrRDPoKY

## "01-SP-002 Confined Space Program (J)" History

-  Document created by Jean Fichter (JFichter@becp.com)  
2024-01-16 - 3:23:09 PM GMT
-  Document emailed to Tom Stalcup (tstalcup@becp.com) for signature  
2024-01-16 - 3:24:19 PM GMT
-  Email viewed by Tom Stalcup (tstalcup@becp.com)  
2024-01-16 - 9:09:29 PM GMT
-  Signer Tom Stalcup (tstalcup@becp.com) entered name at signing as Thomas E. Stalcup  
2024-01-16 - 9:09:42 PM GMT
-  Document e-signed by Thomas E. Stalcup (tstalcup@becp.com)  
Signature Date: 2024-01-16 - 9:09:44 PM GMT - Time Source: server
-  Agreement completed.  
2024-01-16 - 9:09:44 PM GMT