

SECTION 7

CONFINED SPACE ENTRY PROGRAM

I. INTRODUCTION

- A. The United States Department of Agriculture, Agricultural Research Service, and the Stuttgart/Pine Bluff Location (**SPBL**), which consists of the Aquaculture Systems Research Unit (ASRU, 1500 Oliver Road, Pine Bluff, AR 71601), the Dale Bumpers National Rice Research Center (DB NRRC, P.O. Box 1090, Stuttgart, AR 72160) and the Harry K. Dupree Stuttgart National Aquaculture Research Center (HKD SNARC, P.O. Box 1050, Stuttgart, AR 72160) are committed to the ideals of confined space entry safety.
- B. The general intent of the plan for the **SPBL** is to:
 - 1. Comply with the various local, state, and federal regulations governing confined space entry. Chief among these is the Confined Space Entry Standard found in 29 Code of Federal Regulations (CFR) 1910.146. This standard is performance oriented, which means that OSHA has not stipulated the precise methods of complying with it. Instead, compliance is achieved when the program results in a hazard-free work environment.
 - 2. The Collateral Duty Safety Officer (CDSO) is the confined space entry coordinator for **SPBL**.
- C. This plan will be reviewed annually by the Safety Committee and updated as necessary.
- D. The plan will be available to all employees for review and a copy will be located in each site's Library and electronically.

II. DEFINITIONS: For the purpose of this plan the following definitions will apply:

- A. Confined Space:
 - 1. Is large enough and so configured that an employee can bodily enter and perform assigned work.
 - 2. Has limited or restricted means for entry or exit, for example tanks, silos, vessels, storage lines, vaults, manholes.
 - 3. Is not designed for continuous employee occupancy.

- B. **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 physical harm. For purposes of this plan, conex containers and walk in refrigerators, freezers, and seed storage incubators are considered non-permit required confined spaces.
- C. **Permit-Required Confined Space:** A confined space that has one or more of the following characteristics:
1. Contains, or has the potential to contain, a hazardous atmosphere. See the definition of “hazardous atmosphere”, below.
 2. Contains a material that has the potential for engulfing an entrant.
 3. Has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section
 4. Contains any other serious safety or health hazard.
 5. The following are examples of permit-required confined spaces: manholes; storage tanks, whether fixed or mobile, that contained petroleum products or chemicals; grain or feed silos; trenches in soil.
- D. **Authorized Attendant:** Individual stationed outside one or more permit spaces who monitors the authorized entrants and who performs all attendants’ duties assigned in the employer’s permit space program.
- E. **Authorized Entrant:** Employee who is authorized by the employer to enter a permit space.
- F. **Entry Permit:** The written document that is provided by the employer to allow and control entry into a permit space.
- G. **Entry Supervisor:** The person responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required in this plan.
- H. **Hazardous Atmosphere:** An atmosphere that may expose employees to risk of death, incapacitation, impairment of ability to self rescue, or acute illness from one or more of the following causes:
1. Flammable gas, vapor, or mist in excess of 10 percent of it’s lower flammable limit, defined below.
 2. Airborne combustible dust at a concentration that meets or exceeds its lower flammable limit.

3. Atmospheric oxygen concentration below 19.5 percent or above 23.5 percent.
 4. Atmospheric concentration of any substance for which a dose or a permissible exposure limit is exceeded.
 5. Any other atmospheric condition that is immediately dangerous to life and health (IDLH)
- I. Hot Work Permit: An employer's written authorization to perform operations such as braising, welding, cutting, riveting, or other operations capable of providing a source of ignition
- J. IDLH: Immediately dangerous to life and health.
- K. Isolation: A 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 locking and tagging out of all energy sources; blanking, blinding, misaligning, or removing sections of lines, pipes, and ducts; etc.
- L. Lower Flammable/Explosive Limit (LFL or LEL): The minimum vapor-to-air concentration of a given air contaminant below which propagation of a flame will not occur in the presence of an ignition source (i.e., the vapor/air concentration below which the mixture is too lean to burn).
- M. Oxygen Deficient Atmosphere: An atmosphere containing less than 19.5 percent oxygen by volume.
- N. Oxygen Enriched Atmosphere: An atmosphere containing more than 23.5 percent oxygen by volume.
- O. Permissible Exposure Limit (PEL): The eight-hour time-weighted average concentration of a chemical contaminant in air to which an employee may be exposed. PELs are summarized in the 1989 U. S. Department of Labor Publication #OSHA 3112, a copy of which is available in each site's Library.
- P. Rescue service: Personnel designated to rescue employees from permit spaces.
- Q. Retrieval System: Equipment (e.g., retrieval line, chest or full body harness, wristlets, lifting device, anchor) used for non-entry rescues of individuals from permit spaces.
- R. Testing: The process by which the hazards that may confront entrants of a permit space are identified and evaluated.

- S. Upper Flammable/Explosive Limit (UFL or UEL): The maximum vapor-to-air concentration of a given air contaminant above which propagation of a flame will not occur in the presence of an ignition source (i.e., the vapor/air concentration above which the mixture is too rich to burn).

III. RESPONSIBILITIES

- A. The Location Coordinator
LC is **Don Freeman**
1. Responsible for the implementation of the confined space program.
 2. By signature, approves and authorizes the implementation, annual review, and, as needed, amendments to this program.
 3. Provides resources for training, equipment, etc. called for in the program.
- B. Lead scientists and department supervisors are responsible for ensuring employee compliance with the program
- C. Collateral Duty Safety Officer will:
CDSO is **Diana Morian**
1. In concert with the Research Leaders, maintenance personnel, and the safety committee, develop and maintain a list of all location confined spaces.
 - a. Identify possible hazards for each space and note on the list.
 - b. Attach list to this plan and disseminate to all appropriate personnel such as, but not limited to, research leaders, maintenance supervisors, research unit safety representatives, etc.
 2. Oversee the confined space entry program.
 - a. In concert with the Research Leaders, maintenance personnel, and the safety committee, develop specific written procedures for each confined space based upon the hazards in the space and append them to this plan
 - b. Ensure that confined-spaces are secured to prevent unauthorized entry when work is not being performed in them. These measures may include posting signs, erecting fences, securing entry covers with locking mechanisms, or any other effective means.

- c. Monitor employee training given by supervisors.
 - d. Keep copies of all Confined-Space Entry Permits and submit to Safety Committee for annual review.
 - e. Perform compliance inspections.
3. Maintain records of program activities and confined space entries.
- D. Location Safety Committee will:
- 1. Monitor the confined space entry program.
 - 2. Review and update this plan annually.
 - a. Evaluate prior year's confined space entry permits to verify appropriate procedures have been followed.
 - b. Identify any unauthorized entry into a confined space.
 - c. Reevaluate permit spaces to determine if new, different, or previously undetected hazards exist and to determine if a change has occurred in the use or configuration of any permit spaces. Add these changes to future permits, as necessary.
 - d. Study confined space injuries or accidents for preventability.
 - e. Evaluate employee complaints about the effectiveness of the program.
- E. Entry Supervisor
- 1. Will be appointed by the Location Coordinator or his/her authorized representative, for each confined space entry project.
 - 2. Will be trained in and understand the contents of this plan, 29 CFR 1910.146, and the job at hand, with training records kept on file at EACH FACILITY.
 - 3. Will prepare, approve and cancel all entry /hot work permits and supervise all entry operations while work is on going. Sample permits are attached.
 - 4. May act as Authorized Entrant or Authorized Attendant, BUT NOT BOTH.
- F. Authorized Entrant

1. Will perform work in the confined space
2. Will be identified by the Entry Supervisor
3. Will be trained in and understand the contents of this plan, 29 CFR 1910.146, and the job at hand, with training records kept on file at EACH FACILITY.

G. Authorized Attendant

1. Will be trained in and understand the contents of this plan, 29 CFR 1910.146, and the job at hand, with training records kept on file at EACH FACILITY.
2. Remains outside the permit space at all times during operations.
3. Maintains an entry log by name and time of entry/exit of all entrants, ensuring that only persons listed as entrants on the permit are allowed entry (See Page 4 of Confined Space Entry Permit in Appendix 7.4).
4. Maintains Material Safety Data Sheets or other written information on the chemicals or hazards which may exist in the confined space
5. Communicates with entrants as necessary to monitor entrant status and alert entrants of the need to evacuate
6. Monitors activities inside and outside of the space alerts entrants of the need to evacuate if necessary
7. Responsible for summoning rescue and other emergency services
8. Will prevent all unauthorized persons from entering space and notifies the entry supervisor and entrants if unauthorized entry does occur.
9. Performs non-entry rescues as specified by rescue procedures
10. Performs no other duties that prevent the monitoring or protection of the entrants

H. Atmospheric Tester (duties may be performed by Entry Supervisor or Authorized Attendant)

1. Responsible for testing space atmospheric conditions
2. Will be trained in the calibration and use of monitoring instruments, with training records kept on file at EACH FACILITY.

3. Will log all monitoring data on the Confined-Space Entry permit and verify by signature or initials (See Page 3 of Confined Space Entry Permit in Appendix 7.4).
4. Will advise Entry Supervisor of any unsafe atmosphere and will immediately order evacuation of occupied confined spaces

IV. ENTRY PROCEDURES FOR NON-PERMIT-REQUIRED CONFINED SPACES

- A. Because no special hazards or emergency procedures are anticipated with non-permit-required confined spaces, minimal entry protocols and safeguards are required.
- B. The employee wishing to enter the non-permit-required confined space will advise a coworker of their desire and the length of time they expect to be gone.
- C. If the employee has not returned within the designated time, the coworker will visit the non-permit-required confined space and determine if the employee is in it.
- D. If the “missing” employee is in the space, the coworker will:
 1. Establish a new exit time with the employee if the employee is still working
 2. Assist and/or rescue the employee if an accident or problem has arisen
- E. If an accident or problem has occurred, the employees shall advise the CDSO so that the non-permit status of the confined space may be reevaluated

V. ENTRY PROCEDURES FOR PERMIT-REQUIRED CONFINED SPACES

- A. Before allowing entry into a permit-required confined space, the Entry Supervisor shall ensure the following are performed and note them on the entry permit:
 1. Individuals who are to have active roles such as entrants, attendants, entry supervisors, and atmospheric monitors have been designated.
 2. All specified entry conditions are met.
 3. The space is isolated, the energy sources are locked out, and any other special hazards or conditions are controlled as called for under the hazard analysis.
 4. The atmosphere in the space has been tested for atmospheric hazards. Unless the Atmospheric Tester has an instrument capable of simultaneously performing the tests for oxygen deficiency, flammability,

and toxicity, then atmospheric testing shall be performed in the following order:

5. Test for oxygen content first. Any confined space with oxygen content below 19.5% and above 23.5% is unsafe for entry.
6. Test for dusts and combustible gases, vapors, and mists second. Spaces are unsafe for entry if:
 - a. Airborne combustible dusts are at or above their LFL.
 - b. Gases, vapors, or mists are in excess of 10% of their LFL.
7. Test for toxic gases and vapors (or any other atmospheric condition that is immediately dangerous to life or health) next to verify that concentrations do not exist which could result in employee exposure in excess of allowable doses or PELs.
8. If testing indicates a hazardous atmosphere is present, the atmosphere shall be made safe by purging, inerting, flushing, ventilating, or a combination. If flushing or ventilating is used, the replacement air shall come from a clean source and not increase the hazard in the space.
9. There shall be no hazardous atmosphere within the space when any employee is in the space.
10. No one will enter a confined space until forced air ventilation or other steps have been taken to eliminate any hazardous atmosphere.
11. The ventilation will be directed to ventilate the immediate work area or will be within the space and be continuous until entrants have vacated
12. Pedestrian, vehicle, or other barriers as necessary have been provided to protect entrants from external hazards
13. Means of communication between entrants and attendants has been provided
14. Personal protective equipment, rescue equipment, or other special equipment as called for on the permit (e.g., intrinsically safe lighting) has been provided to allow the entrants to work safely
15. At least one attendant has been stationed outside the permit space and will remain there during the duration of the work

16. Procedures have been developed for rescuing entrants from permit spaces, for providing necessary emergency services to rescued employees, and for preventing unauthorized personnel from attempting a rescue.
 17. A separate hot work permit (See Page 5 of Confined Space Entry Permit in Appendix 7.4) has been prepared if cutting, braising, welding, or other ignition producing operations are to be performed in the space. The Entry Supervisor will perform the following and note them on the hot work permit:
 - a. The reason for hot work
 - b. Special equipment required for hot work, such as non-sparking tools, etc.
 - c. All hazards associated with the hot work and the controls for them
 - d. Authorized Entrants with specialized hot work skills
 - e. When conditions of the hot work permit are met, the Entry Supervisor then authorizes such work by signing the hot work permit and attaching it to the confined space entry permit
 - f. Duration of the permit will not exceed the time required to complete the hot work task
 - g. Hot work permit is canceled at any time conditions change or when the confined space entry permit is voided or canceled
 18. After verifying that all conditions have been met, the Entry Supervisor will authorize entry by signing the Confined Space Entry Permit.
 19. Each permit will receive a unique number and all accompanying documents will be assigned the same corresponding number
 20. The duration of the permit will not exceed the time required to complete the task or eight hours whichever is less
 21. The permit will be posted at the entrance to the space
 22. When work is completed, permit will be canceled and kept on file for no less than three years
- B. Permit-required confined space entry and egress
1. Remove the entrance cover to the space

- a. Any conditions making it unsafe to remove an entrance cover shall be eliminated before cover is removed
 - b. After cover is removed, the opening will be properly guarded by any means to prevent accidental fall or entry into the space
 2. Perform the work, with the Authorized Attendant monitoring conditions to ensure the specifications of the permit are being maintained.
 3. When work is complete, return the space to its operational condition. This is usually done by reversing the entry procedures (i.e., reconnecting energy sources and process lines, verifying work tools and personnel are out of the space, resealing the entry point, etc.). If special recommissioning procedures are required, they can be added to the entry permit.
- C. Emergency evacuation of the confined space
 1. Evacuation of the space will be initiated by any person recognizing or suspecting an unsafe condition. Evacuation shall occur if:
 - a. A hazardous atmosphere is detected. It may be necessary to monitor the internal atmosphere on an ongoing basis to ensure that there is not an accumulation of hazardous dusts, vapors, gases, or mists during the job.
 - b. A warning sign or chemical exposure symptom is detected
 - c. A prohibited condition is detected
 - d. A hazardous condition outside the space occurs
 - e. The Authorized Attendant is unable to perform their duties while work is occurring in the space
 2. The space will be reevaluated, and a new entry permit shall be completed, before reentry
- D. Rescue procedures
 1. If work in a confined space could expose employees to a chemical substance, a Material Safety Data Sheet (MSDS) for that substance shall be kept at the work site. The MSDS shall be made available to personnel performing rescues and to medical facilities treating the exposed personnel.
 2. Rescue procedures will be developed and attached to the Confined Space Entry Permit (See Page 2 of Confined Space Entry Permit in Appendix 7.4). Emergency phone numbers such as fire department, ambulance service, etc., shall be included in the procedures.
 3. Non-Entry Rescue:

- a. A retrieval system or method will be used whenever an authorized entrant enters a permit space unless the equipment increases the overall risk of entry or would not contribute to the rescue
- b. Each authorized entrant will use a chest or full body harness with a retrieval line attached at the center of the entrants' back near shoulder level or above the entrants head
- c. Wristlets may be used in lieu of the harness if the harness is infeasible or creates a greater hazard
- d. The other end of the retrieval line must be attached to a mechanical device or fixed point outside the space so that the rescue can begin as soon as it becomes necessary. The device must be available to retrieve personnel from vertical type permit spaces more than 5 feet deep.
- e. Space-specific rescue procedures will be developed and attached to the Confined Space Entry Program.

4. Entry Rescue

- a. No employee will enter a space to accomplish a rescue unless:
 - 1) The employee is part of an established in-house rescue team
 - 2) The rescue team has met all requirements for equipment and training as outlined in 29 CFR 1910.146. Among other things, they are required to (1) be trained in the use of personal protective equipment and rescue gear, (2) perform periodic simulated rescue operations in the space, and (3) hold a certification in first aid and cardiopulmonary resuscitation.
- b. Rescue services other than in-house personnel will be informed of the potential hazards that may be faced

E. CONTRACTOR ENTRY TO CONFINED SPACES

- 1. The Government's Contracting Officer (or designated representative) is responsible for advising contractors of non-permit-required and permit-required confined spaces in the work area
- 2. The Government's Contracting Officer will:

- a. Inform the contractor of non-permit-required and permit-required confined spaces in the work area
- b. Apprise the contractor of any hazards or potential hazards requiring the space to be permitted
- c. Advise the contractor of any precautions or procedures that have been implemented for employee protection in or near the space
- d. Coordinate entry operations when both government and contractor employees enter space
- e. Debrief the contractor at the end of operations regarding any hazards confronted or created in the space.
- f. Review and approve of contractor's Confined-Space Entry Program prior to any entry into a permitted space

APPENDIX 7.1

CONFINED-SPACES FOR DB NRRC

HL2 COLD STORAGE 201A

Non-permit required

Entry times 8:30am, 10:30am, 1:30pm and 3:30pm

Rules for entry: Someone shall remain in the hall outside the door when anyone is working inside the room.

152A Seed storage room

Non-permit required

Rules for entry: Notify someone you are working in the room and when you will return.

245A Seed storage room

Non-permit required

Rules for entry: Notify someone you are working in the room and when you will return.

206A Growth Room

Non-permit required

Rules for entry: Notify someone you are working in the room and when you will return.

Monitoring basin for room HL-10

Non-permit required

Rules for entry: Someone will remain above ground until employee comes out.

Water Main Basin

Non-permit required

Rules for entry: Notify someone you are working in the basin and when you will return.

Monitoring basin for building

Permit required

ARS Personal do not enter

Hazard: Asphyxiation

Sewage Grinding Station

ARS Personal do not enter

Permit required

Hazard: Asphyxiation

Water Storage Tank

Permit required

ARS Personal do not enter

Hazard: Drowning

APPENDIX 7.2

CONFINED-SPACES FOR SNARC

Pumping Station

Permit Required

Rules of entry: Lock-out/tag-out must be implemented. Someone will remain outside of the pumping station while someone is inside. Protective equipment (gloves, dust mask) must be worn. The station must be pumped dry before entry.

Hazard: Asphyxiation

Chlorinating vat (South)

Permit Required

Rules of entry: Lock-out/tag-out must be implemented. Someone will remain outside of the chlorinating vat while someone is inside. Protective equipment (gloves, dust mask) must be worn. The station must be pumped dry before entry.

Hazard: Asphyxiation

Chlorinating vat (North)

Permit Required

Rules of entry: Lock-out/tag-out must be implemented. Someone will remain outside of the chlorinating vat while someone is inside. Protective equipment (gloves, dust mask) must be worn. The station must be pumped dry before entry.

Hazard: Asphyxiation

Water Storage vat (North)

Permit Required

Rules of entry: Lock-out/tag-out must be implemented. Someone will remain outside of the water storage vat while someone is inside. The vat must be pumped dry before entry.

Hazard: Drowning

Water Storage vat

Permit Required

Rules of entry: Lock-out/tag-out must be implemented. Someone will remain outside of the water storage vat while someone is inside. The vat must be pumped dry before entry.

Hazard: Drowning

Walk-In Cooler

Non-Permit Required

Rules of entry: Notify someone you are working in the walk-in cooler.

Concrete kettles

Non-Permit Required

Rules of entry: Notify someone you are working in the kettle.

APPENDIX 7.3

CONFINED-SPACES FOR ASRU

None – Handled by UAPB Personnel

EMERGENCY/RESCUE PROCEDURES

NON-PERMIT ENTRY AREA

Two (2) person entry: call emergency personal.

PERMIT ENTRY AREA

NO ARS personnel shall enter.

EMERGENCY PHONE NUMBERS

CDSO 870-672-9300 ext.274.

Ambulance 911

Fire 911

Sheriffs Office 911

