Confined Space Safety Program

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District: Coal Creek Utility District

The following safety related program is for informational purposes only. The SORT committee hopes that each participating district will look at this program and discuss how it compares to the district's own practices. This program is NOT a complete safety program, but intended as guidelines. There is no guarantee that following a given program will eliminate or substantially reduce the risk of claim or injuries. It is expected that member districts will consider this program and adapt or modify it to fit the district's particular needs and circumstances.

CONFINED SPACE SAFETY PROGRAM

TABLE OF CONTENTS

PURPOSE / SCOPE

The purpose of the Confined Space Safety Program is to ensure that all employees understand the potential hazards and the District's program for protecting them from those hazards to the greatest extent possible and to establish the requirements for working safely in such an environment.

This is intended to be a universal document that describes precautions and procedures that must be followed in all cases. Field management and staff will develop Standard Operating Procedures for work at specific sites and for specific work tasks, which will take into account all safety issues and will define the most effective methods of accomplishing the work objectives safely and efficiently.

All employees are encouraged to actively participate in identifying opportunities for applying engineering controls that would reduce the hazards.

Policy Statement

It is the primary policy of the District to use engineering controls wherever practical to reduce or eliminate the need for employees to enter into confined spaces. Where employees must work in confined spaces, it is the policy of the District that the employees will comply fully with this Safety Program.

Confined spaces vary in size, configuration and use. Examples of confined spaces include, but are not limited to; storage tanks, compartments, pits, vats, degreasers, boilers, ventilation and exhaust ducts, sewers, underground utility vaults and pipelines.

EXEMPTIONS / EXCLUSIONS

N/A

HAZARD ANALYSIS

The procedures within this program state the minimum of general work practices when entering confined spaces. It is not intended to supersede the requirements set forth in WAC 296-809 Confined Spaces. On any occasion when a situation not covered by this policy or encountered when entering confined spaces, strict adherence to Washington State Department of Labor & Industries regulations is required. Employers must review the regulation for particular requirements that are applicable to their specific situation(s) and which may not be covered in detail by this safety program.

A confined space is any enclosed area that has all of the following characteristics:

- Large enough and arranged for a person to fully enter the space and work
- Not primarily designed for human occupancy
- Has limited or restricted entry or exit

Hazard Description

Entrants entering any confined space must recognized at all times that a safety hazard could be present in confined spaces due to toxicity, flammability, oxygen deficiency, mechanical or electrical problems, engulfment by water or fine particles, presence of corrosives, excessive temperatures, or any of the hazards listed in the recognition checklist.

Employees could be exposed to the following:

- Engulfment and drowning.
- Presence of toxic gases.
- Presence of explosive/flammable gases. Equal to or greater than ten percent of the lower flammable limit (LFL).
- Oxygen deficiency. A concentration of oxygen in the atmosphere equal to or less than 19.5% by volume.
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Hazard Evaluation: Ventilation

Any space that doesn't have the ability to be shored, dewatered, drained or naturally ventilated can be a potential problem. Substance-specific tests, which measure levels of specific substances, are important when actual and potential contaminants have been identified. They are vitally important when deciding on appropriate entry conditions and proper protection for entrants such as ventilation or personal protective equipment.

Substance-specific devices may not detect potentially lethal atmospheric hazards, which may suddenly enter a sewer environment.

Sewer & waste water confined spaces should be continuously ventilated. They differ from other confined space entries in the following ways:

- The space usually cannot be isolated.
- Contains potential risk of sharp objects, either in channel or structure
- The atmosphere may suddenly become lethally hazardous, for example toxic, flammable or explosive atmospheres may enter the work area from another portion of the system.
- Unlike other types of work where entry is rare, a sewer worker's environment will always be considered a permit-required confined space.

Methods of Evaluation

N/A

Exposure Determination

Employees working or performing maintenance in vaults, manholes, wet wells, water and sewer lines or storage tanks are exposed to these hazards.

Records of Exposure

Confined Space records, such as Entry Permits, record of the hazardous elements that entrants are exposed to. These are considered medical in nature and must be maintained for a period of not less than 30 years, unless the employee leaves the place of employment prior to the end of his/her first year. Such an employee may request surrender of such records prior to leaving your organization.

RESPONSIBILITES

District

Employers must prevent unauthorized entrance into its confined spaces, also:

- Provide employee training
- Develop a written permit-required confined space entry program
- Certify employee proficiency
- Make sure entrants are equipped with and trained to use, atmospheric testing equipment that is capable of identifying at least the following: Oxygen concentration less than 19.5 percent, flammable gas or vapor at ten percent or more of the lower flammable limit (LFL), Hydrogen sulfide of 10 parts per million (ppm) or more and carbon monoxide of 35 ppm or more.
- Provide rescue and emergency services for employees who enter confined spaces

Any employee required or permitted to pre-check or enter a confined space must have successfully completed, at a minimum, the training outlined in this program.

Designated Person or Safety Program Coordinator

Periodically review this program with appropriate personnel for compliance.

Evaluating Space Conditions You must:	In order to
Test conditions before entry	Determine that acceptable entry conditions exist before entry is authorized by the entry supervisor
Test or evaluate space conditions during entry	Determine that acceptable entry conditions are being maintained during entry operations
Evaluate entry operations	Make sure entrants of more than one employer working at the same time in or around a permit-required confined space, do not endanger each other

Entry Supervisor

1. Authorizes the entry into a permit required confined space by completing and signing the Confined Space Entry Permit.
2. Oversees entry operations.
3. Knows about the hazards that may be faced during entry, including the mode, signs or symptoms and consequences of the exposure.
4. Verifies and checks the appropriate entries have been made on the permit, all tests specified by the permit have been conducted, all procedures and equipment specified by the permit are in place before approving the permit and allowing entry to the space.
5. Have the authority to cancel a permit and terminate entry whenever assigned task or job is completed or if a condition in the space that is not covered by the entry permit is discovered.
6. Verifies that rescue services are available and that there is a way to contact them.
7. Removes unauthorized individuals who enter or attempt to enter the permit-required confined space during entry operations.
8. Determines that entry operations remain consistent with the terms of the entry permit and acceptable entry conditions are maintained.

Employees

Employees performing duties as an **entrant** must:

- Know the hazards they face during entry, including the mode, signs, recognition, symptoms and consequences of exposure to the hazards. A few examples of hazards that might be encountered are: Slippery manhole ladder rungs, working in high traffic zones, sharp or rusted objects in vaults, exposure to chemicals and exposure to an oxygen deficient atmosphere.
- Familiar with proper use of equipment.
- Communicate with the attendant as necessary so the attendant can monitor entrant status and alert entrants of the need to evacuate.
- Alert the attendant whenever either if these situations exist: warning sign or symptom of exposure to a dangerous situation such as behavioral changes, euphoria, giddiness potentially from lack of oxygen or exposure to solvents. A prohibited condition.
- Exit the space as quickly as possible whenever: an evacuation order is given, the entrant recognizes a dangerous situation, the entrant detects a prohibited condition and an evacuation alarm is activated.

Employees performing duties as an **attendant** (also emergency rescue) must:

- Performs atmospheric pre-entry tests along with subsequent testing for the duration of the occupation of a confined space.
- Continuously monitors space where isolation of hazards is not feasible. Example: Flowing sewer lines or wastewater environments.
- Identify and understand the hazards that may be faced during entry, including the mode, signs or symptoms and results of exposure to the hazards.
- Is aware of behavioral/overexposure symptoms and their physiological effects of exposure to the hazard.
- Continuously maintains an accurate count of entrants in the space.
- Maintains an accurate record of who is in the permit-required confined space.
- Communicates with entrants as necessary to monitor their status or alert them of the need to evacuate the space.
- Monitors activities inside and outside the space to determine if it is safe for entrants to remain in the space.
- Orders entrants to evacuate the space immediately if any of the following conditions occur: a prohibited condition, behavioral effects of hazardous exposure in an entrant, a situation outside the space that could endanger entrants and the attendant cannot effectively and safely perform all the duties required in this chapter.
- Takes the following actions when unauthorized persons approach or enter a space: warn unauthorized persons to stay away from the space, if an unauthorized person enters the space demand immediate exit, inform entrants and the entry supervisor of unauthorized entry.
- Performs non-entry rescues as specified by your rescue procedures.
- Does not deviate from duties that may interfere with their primary duty to monitor and protect the entrants.
- Calls for rescue and emergency services as soon as entrants need assistance to escape from the space.
- Monitors entry operations until relieved by another attendant or all entrants have exited the space.

GUIDELINES/RULES

WAC 296-809-20002 defines spaces as follows:

A **permit required confined space** or permit space is a confined space that has one or more of the following characteristics capable of causing death or serious physical harm:

- Contains or has a potential to contain a hazardous atmosphere.
- Contains a material with the potential for engulfing someone who enters the space.
- Has an internal configuration that could allow someone entering to be trapped or asphyxiated by inwardly converging walls or by a floor, which slopes downward and tapers to a smaller cress-section.
- Contains any physical hazard. This includes any recognized health or safety hazards including engulfment in solid or liquid material, electrical shock, or moving parts.
- Contains any other recognized safety or health hazard that could either:
    - Impair the ability to self rescue
      or
    - Result in a situation that presents an immediate danger to life or health.

(Not specifically mentioned in this WAC, typical equipment used in these spaces includes but is not limited to: Fall protection, Self Retracting Lifelines/SRL's, explosion proof blowers or lights.)

A **non-permit confined space** is a confined space that does not contain actual hazards or potential hazards capable of causing death or serious physical harm. Note: *these spaces should not require additional equipment to safely enter.*

Reclassification of confined spaces

- All confined spaces are classified as a permitted confined space, unless it can be reclassified. To reclassify the confined space it will not contain any actual or potential hazard atmosphere capable of causing death or serious physical harm. This includes any recognized health or safety hazards including engulfment in solid or liquid material, electrical shock or moving parts.
- If you must enter to remove hazards, the space must be treated as a permit-required confined space until hazards have been eliminated.
- Document how you determined the confined space contained no hazards. Certify this documentation with the following: date, location of the space, signature of the person making the determination and make this certification available to each entrant.
- Reevaluate a non-permit confined space if hazards develop.
- Reclassify a non-permit confined space to a permit-required space if changes in the use or configuration of the space increase the hazards to entrants.
- Have entrants exit the space if hazards develop. Then revaluate the space and determine whether it must be reclassified as a permit-required confine space.

Employees identifying and Controlling **Permit–Required** Confined Spaces must:

- Assume any confined space is a permit-required confined space with known or potential hazards until you evaluate the confined space and there are no potential or actual hazards, you can consider it to be a non-permit confined space.
- Identify all permit-required confined spaces in your workplace.
- Document your determination that the space is non-permit.

- Make available all information and documents required about confined spaces.
- Inform employee and their entrants of the existence, location, and danger of any permit-required confined spaces in your workplace by posting danger signs (example; "danger – permit confined space, do not enter") or using any other equally effective means.

Take effective measures to prevent unauthorized entrants from entering permit-required confined spaces such as:

- Securing lid with a locking device
- Bolting the lid shut
- Design latches that require special tools to open
- Employee training

When contracted workers enter a district owned confined spaces you must:

- Inform the contractor when the workplace contains permit-required confined spaces and entry is allowed only if the requirements are met.
- Inform the contractors of any identified hazards, your experience with the permit confined space, any precautions or procedures <u>you require</u> for protection.
- Coordinate entry operations with the contractor, when either employees or employers from the different companies will be working in or near permit-required confined spaces.
- Discuss entry operations, the program followed and any hazards confronted.

An attendant must be provided outside the permit-required confined space. The number of attendants assigned should be tailored to the requirements of the space and the work performed.

Dry wells may be entered without the need for a written permit if the space can be maintained in a safe condition for entry by mechanical ventilation alone.

Your designated entrants should be employees who are thoroughly trained in water or sewer entry procedures and can demonstrate that they follow entry procedures when entering confined spaces.

Consider the unique circumstances of your system when preparing for entry, including the unpredictability of the atmosphere. Only you can decide based upon knowledge and experience, what are the best types of testing instruments for any specific entry operation.

Collect and analyze data on the atmosphere of your space using equipment that's sensitive enough and specific enough for any hazardous atmosphere that may arise. This will enable you to develop appropriate entry procedures and maintain acceptable entry conditions.

Have a technically-qualified individual evaluate and interpret the testing data, identify all serious hazards and develop appropriate entry procedures.

Use the equipment specified on your permit, for the time specified by the manufacturer, to determine whether contaminants are within the range of acceptable entry conditions.

An entry permit must be filled out before entry and shall include the following:

- Test for atmospheric hazards, in this order: oxygen, combustible and toxic gases and vapors. Most combustible gas meters are oxygen dependent and will not provide reliable readings in an oxygen-deficient atmosphere. Combustible and

toxic gases present an immediate threat to life, through inhalation, fire or explosion.

- Reevaluate the permit-required space in the presence of any entrant who requests this to be done because they have reason to believe that the evaluation of that space may not have been adequate.
- Upon request, immediately provide each entrant, with the results of any testing required by the Confined Space Program.
- Identify and evaluate potential hazards be before entrants enter or work in the confined space.
- Document that you have completed the means, procedures and practices necessary for safe entry and work.
- An opportunity for entrants to observe any monitoring or testing or any actions to eliminate or control hazards.
- Identity of the entry supervisor.
- Verify that the entry supervisor signs the entry permit authorizing entry, before the space is entered.
- Completed permit must be available to entrants at time of entry. This can be achieved by either posting the completed permit at the entry location or by any other equally effective means.
- The duration of the permit must not exceed the time required to complete the assigned task or job identified on the permit.
- Note any problems encountered during an entry operation on the permit. Use the information to make appropriate revisions to your program, entry operations, means, system, procedures and practices.
- Continuously monitor conditions in areas where entrants are working, when isolation of the space is not feasible.

The Entry permit must list:

- The location of the permit space to be entered.
- The purpose of the entry.
- The date and the authorized duration of the entry permit.
- The names of entrants, attendants, and their duties.
- The names of supervisors (printed, or otherwise legible & signature) authorizing entry.
- Hazards found in the permit space.
- Methods used to control or eliminate permit space hazards. (Examples: lockout/tag out, procedures for purging, inserting, ventilating and flushing)
- Rescue and emergency services available with names and contact information, include equipment to be used.
- Communication procedures for entrants and attendants to maintain contact during the entry.
- Other pertinent information to ensure safety. Results of initial and periodic tests performed to evaluate and identify the hazards and conditions of the space, accompanied by the names or initials of the testers and by an indication of when the tests were performed.

Applicable SOPs

Verify that acceptable entry conditions exist by testing the space for a hazardous atmosphere.

Record test results, such as actual concentration, in the appropriate space on the permit.

Be certain to calibrate atmospheric testing equipment in accordance with the manufacturer's instructions.

When monitoring atmospheres, it is best to monitor the atmosphere at a distance of approximately 4 feet in the direction of travel, and to each side. If using a sampling probe, adapt the entrant's rate of progress to the sampling speed and detector response. The selected testing instruments should be carried and used by entrants to continuously monitor the atmosphere and warn the entrants of any potential atmospheric hazards, in direction of travel.

Required PPE

Employers must provide and maintain proper equipment (296-809-50010) at no cost to the employee:

- Testing and monitoring equipment that complies with Federal and State requirements.
- Ventilator/Blower equipment needed to obtain acceptable entry conditions.
- Communications equipment/procedures.
- Lighting
- Barriers or shields
- Ladders
- Rescue and emergency equipment.
- Alarm systems.

Prevention Actions

A written program needs to be developed to identify and evaluate the hazards of permit-required confined spaces and the work performed. You must develop the program before entrants enter any confined space. The program must describe the means, procedures and practices to be used for safe entry. Including but not limited to:

- Documentation of permit entry procedures.
- Documentation used for alternate entry procedures.
- How to reclassify permit-required confined spaces to non-permit spaces.
- Designation of employee roles, such as entrants, attendants, entry supervisors, rescuers or those who test or monitor the atmosphere in a permit-required space.
- Identification of designated employee duties.
- Training employees on their designated roles.
- How to identify and evaluate hazards.
- Use and maintenance of equipment.
- How to prevent unauthorized entry.
- How to coordinate entry with another employer.
- How to rescue entrants.
- Consult with affected entrants when developing and implementing all aspects of your permit-required confined space program.
- Make the written program available to entrants.
- Update your written program as necessary.

Conduct a review to evaluate and control hazards for safe entry. Revise your program before allowing subsequent entries. Employees may perform a single annual review covering all entries performed during a twelve month period. If no entry is performed during the twelve month period, no review is necessary.

Examples of circumstances requiring a review:

- Unauthorized entry of a permit space
- Permit space hazard not covered by the permit is found
- A condition prohibited by the permit occurs
- An injury or near-miss occurs during entry

- Any change in configuration of the permit space and entrants complains about the effectiveness of the program.
- Review canceled entry permits within one year.

Implement measures necessary to prevent unauthorized entry into permit-required confined spaces, when conducting authorized entry. Example of measures to prevent unauthorized entry is signs, barricades and warning tape.

Use non-entry retrieval systems or methods to rescue entrants in a permit-required confined space unless this would increase the overall risk of injury to entrants or would not contribute to the rescue of the entrant.

Require each entrant to use chest or full-body harness, with a retrieval line attached to the harness at one of the following locations: center of entrants back or near shoulder level, above the entrants head or at another point which presents a profile small enough for the successful removal of the entrant.

Attach the retrieval line to a mechanical device or fixed point outside the space, so rescue can begin as soon as necessary.

Verify a mechanical device or fixed point outside the spaces are able to retrieve entrants from vertical spaces more than five feet deep.

Make sure, when using alternate entry procedures, instead of permit entry procedures, that you have mitigated all hazards from the space, and have recorded monitoring and inspection data that supports the following:

- The only hazard of the permit-required confined space is an actual or potentially hazardous atmosphere.
- Continuous forced air ventilation alone is all that is needed to maintain the permit-required confined space for safe entry.
- An entry to obtain monitoring and inspection data or to eliminate hazards is performed according to WAC 296-809-500, Permit Entry Procedures.
- All documentation produced is available to each affected employee and their authorized representative.
- Atmospheres containing **sewer or wastewater are not alternate entry spaces**…
- A direct reading gas monitor is used (such as four-gas monitors).
- A supervisor who has successfully completed the gas detector training for the monitoring method used performs testing.
- The minimum parameters to be monitored are oxygen deficiency, Lower Flammable Level (LFL), and hydrogen sulfide concentration.
- A written record of the pre-entry test results must be made and kept at the worksite for the duration of the job.
- Affected employees must be able to review the testing results.
- The most hazardous conditions will determine when work is being performed in two adjoining, connecting spaces.
- Mechanical and space ventilation systems, where required are set at 100% of the outside air.
- Always open additional manholes to increase air circulation.
- Use explosion proof stationary or portable blower systems to increase natural circulation. Heat and electrical equipment should also be rated explosion proof.
- After a suitable ventilation period, repeat the testing.
- Entry may not begin until testing has demonstrated that the hazardous atmosphere has been eliminated or controlled. If there is a potential for a hazardous atmosphere, then alternate entry is not allowed.

- All pumps and lines, which may reasonably cause contaminants to flow into the sewer, are disconnected, blinded and locked out, or effectively isolated by other means to prevent development of dangerous air contamination or engulfment.

Atmospheric testing is used so you can evaluate potential atmospheric hazards and verify that acceptable atmospheric entry conditions exist.

To the extent possible, sewer crews should develop and maintain a relationship with the local weather bureau and fire and emergency services. In this way, sewer work may be delayed or interrupted and entrants withdrawn, whenever the following occur: sewer lines are suddenly flooded by rain or fire suppression activities or flammable or other hazardous materials are released into sewers due to industrial emergencies or transportation accidents.

RESCUE

- Call the local rescue services for rescue.
- Only trained and properly equipped personnel make rescue entries.
- If immediate hazards to injured personnel are present, workers at the site implement emergency procedures without entering the space.
- If at any time the use of a hoisting device or full-body harness and attached lifeline may endanger the worker, their use may be discontinued.
- If there is any questionable action or non-movement by the worker inside. Perform a verbal check, if there is a questionable or no response. Immediately remove the worker.
- If the worker is disabled due to falling or an impact, continue to mitigate the hazards inside the space until rescue personnel arrive.
- Only trained rescue personnel may enter to perform a rescue.
- Evaluate the type of rescue services you need and determine how well rescue services perform.
- Select and use either on-site rescue teams or off-site rescue teams or services that will minimize the potential for harm to both entrants and rescuers.

When providing for rescues: The employer will confirm that each member of the rescue teams or outside service can:

- Respond to a rescue call in a timely manner.
- Have the appropriate equipment for the type of rescue for different type of space.
- Must have practiced rescue training at least once every 12 months and provided access to permit spaces so training can be practiced on actual confine spaces for both recoveries & rescues.
- Make space available for such practice sessions
- Rescues must utilize <u>all</u> Confined Space Entry equipment in your inventory including SCBA systems
- Your policies should have stand alone procedures designating:
    - Personnel on rescue teams
    - Inter-local agreements with outside rescue agencies
    - Designate the first aid response for your staff
- Inform each rescue team or service about the hazards they may confront when called to perform rescue.
- Are trained in First Aid and CPR. At a minimum, one rescue team member will be currently certified in First Aid and CPR.
- Establish procedures for contacting rescue and emergency services, rescuing entrants from permit-required confined spaces, providing necessary emergency services to rescued entrants and preventing unauthorized persons from attempting a rescue.

Your evaluation of any rescue team or service should consist of an initial evaluation where you decide whether a rescue team or service is adequately trained and equipped to perform the kind of rescues needed at your workplace in a timely manner.

For an off-site rescue service you need to contact the services to plan and coordinate the evaluations required.

Do not post a rescue team or service's number without contacting them or plan to rely on 911 emergency services without checking to see if they are able to provide rescue services.

Whether a rescue service meets your workplace needs depends on the confined spaces from which a rescue may be necessary, the hazards likely to be encountered in those spaces and the number of entrants needing rescue.

First Aid Awareness and Actions

- Call 911
- Perform CPR if necessary
- Apply basic first aid until emergency personnel arrive

FORMS USED – Sample Confined Space Entry Permit

- Go online to: http://www.lni.wa.gov/wisha/rules/confinedspace/PDFs/HT4.pdf

TRAINING

The employer must provide training to entrants involved in confined space activities so they acquire the understanding, knowledge and skills necessary to safely perform duties assigned.

Training must be provided at the following times:

- Before the entrants are first assigned duties.
- Before there is a change in assigned duties.
- When there is a confined space hazard for which the entrants have not previously been trained.
- Whenever the employer has reason to believe either that there are deviations from the confined space entry procedures or that there are inadequacies in the entrant's knowledge or use of these procedures.
- Certify entrant's proficiency in their assigned duties.
- Verify the certification contains each entrant's name, the trainer's written or electronic signature or initials and dates of training. Make certification available for inspection by entrants.

REFERENCES/RESOURCES

REVISION RECORD

Revision No.	Revision Date	Approval Date	Change
1.0.	08-09-07		Initial design.
2.0	2-6-09		Revised into new format Robert Smart
3.0	1-10-2012		Revised for content by Vincent Gabrio

APPROVALS

Safety Committee Chairperson Date

General Manager Date

DEFINITIONS

AIRBORNE COMBUSTIBLE DUST
An airborne hazard associated with confined spaces is dust particles. If there is a material in the air that is capable of being burned or ignited, and if it is of such a concentration that it reduces visibility to five feet or less.

ATTENDANT
An individual stationed outside one or more permit-required confined spaces to monitor the entrant(s) inside. Person can also perform entry supervisor duties.

ATMOSPHERIC HAZARDS
There are many different kinds of atmospheric dangers (such as carbon monoxide, paints, solvents, dust, etc.), and any one or all may be present at any time. Most signs and symptoms of exposure are headache, dizziness, giddiness, lightheadedness, and loss of coordination. Atmospheres may be Explosive, Oxygen Deficient, or Toxic.

ATMOSHPERIC MONITORING EQUIPMENT
Any equipment, such as gas detectors, that measure and monitor the atmosphere of a confined space.

ATMOSPHERIC TESTING
Atmospheric testing is required for two distinct purposes; evaluation of the hazards of the permit space and verification that acceptable entry conditions for entry into the space exists. Use electronic gas detection instruments for testing the atmosphere in a confined space prior to and during entry. Crews are provided with a gas detector (by their employer) that monitors for an explosive atmosphere, toxic atmosphere, and oxygen deficiency simultaneously. The detector is calibrated to set off an audible alarm at levels recognized as immediately dangerous. Acceptable entry conditions are:

CARBON MONOXIDE (CO):	Less than 35 parts per million
OXYGEN (O2):	Between 19.5% and 23.5%
COMBUSTIBLE:	Less than 10% of the lower explosive limit (LEL)
HYDROGEN SULFIDE:	Less than 10 parts per million

Order of testing: A test for oxygen is performed first because most combustible gas meters are oxygen dependent and will not provide reliable readings in an oxygen deficient atmosphere. Combustible gases are tested for next because the threat of fire or explosion is both more immediate and more life threatening, in most cases, than exposure to toxic gases and vapors. If tests for toxic gases and vapors are necessary, they are performed last.

Explosive gases are lighter than air and tend to gather at the top of the space. Oxygen deficiency usually is detected at the bottom, and the gas detector must be lowered far enough to detect the condition. Since your life may depend on this instrument calibration will be conducted per manufacture's recommendation and instructions.

BLOWER / VENTILATOR
Gasoline or electric powered equipment used to help ventilate a confined space.

ELECTRICAL HAZARDS

Electrical shocks can occur when the workers come in contact with faulty/exposed electrical equipment. As a general rule, the entrants will be trained to inspect electrical cords, plugs and tools for defects such as exposed conductors or worn or frayed insulation. A lockout/tag out procedure will be followed when in a confined space. *See S.O.R.T.'s Lockout/Tag out Safety Program.*

ENGULFMENT
The surrounding capture of a person by a liquid or finely divided (flow able) solid substance that can be inhaled 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.

ENTRANT
An employee who is authorized by the employer to enter a permit-required confined space.

ENTRY
The process involving a person that passes through an opening and into a confined space to perform work or other activities. Entry is considered to have occurred as soon as any part of the entrants' body breaks the plane of an opening into the space, or his/her upper torso is no longer above the space while in a standing position.

ENTRY PERMIT
The written or printed document that is provided by you to allow and control entry into a permit-required confined space and that contains the information required in WAC 296-809-500.

ENTRY SUPERVISOR
A person (such as the employer, crew leader, or crew chief) 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 the termination of entry as required. The individual can also perform attendant duties.

HAZARDOUS ATMOSPHERE
The exposure of an atmospheric contaminant or related risk, causing employees and authorized representatives to experience the risk of death, incapacitation, impairment of ability to self-rescue, injury, or acute illness caused by flammable gas, mist or vapor (most commonly Hydrogen sulfide, Oxygen deficiency or carbon monoxide) concentrations that would cause death, or permanent health problems.

HOT WORK PERMITS
A written authorization to perform operations, for example, welding, cutting, riveting, burning or heating that can provide a source of ignition or creating a toxic atmosphere.

IMMEDIATELY DANGEROUS TO LIFE OR HEALTH (IDLH)
A work environmental condition that poses an immediate or delayed threat to life; or would cause irreversible adverse health effects, or interfere with an individual's ability to escape unaided from a confined space.

INERTING
The displacement of the atmosphere in a permit-required confined space by a noncombustible gas (such as nitrogen) to such extent that the resulting atmosphere is noncombustible.

MECHANICAL VENTILATION
The use of an explosion proof mechanically powered air blower system to move fresh air from a clean source, into a confined space, purging either offensive or hazardous atmospheres.

NATURAL VENTILATION
Using the natural transference of air from a clean air source (such as: opening a door or a lid) into a permitted or non-permitted confined space.

NON PERMIT REQUIRED CONFINED SPACE
A confined space lacking hazards or has had hazards mitigated or removed.

OXYGEN DEFICIENT ATMOSPHERE
If the oxygen level of a confined space falls below 19.5%, then the atmosphere is considered to be "oxygen deficient". Oxygen deficient atmospheres can result in oxygen starvation of the entrants. The most common cause of death in confined space fatalities is asphyxiation.

OXYGEN ENRICHED ATMOSPHERE
If the oxygen level of a confined space reaches above 23.5%, then the atmosphere is considered to be "oxygen enriched" (normal concentration is 21%. Oxygen enriched atmospheres are dangerous because they can enhance the ability of ignition of combustible materials. Sparks from welding, cutting, grinding, and the operation of electrical equipment could cause an explosion or fire in an oxygen-enriched atmosphere.
Note: Do not ventilate with pure oxygen to raise oxygen levels because oxygen levels higher than 23.5% will increase fire danger.

OXYGEN	SYMPTOMS
16-19.5%	Mild impaired coordination, fatigue could impede self - rescue.
12-16%	Increased breathing and pulse. Impaired judgment and/or coordination
10-12%	Further increase in respiration/pulse, blue lips and mental confusion.
8-10%	Fainting, nausea, vomiting, mental confusion
6-8%	Collapse, death within 8 minutes
0-6%	Coma in 40 seconds or less. **DEATH**

PERMIT
A written or printed document that is provided to allow and control entry into a permit-required confined space.

PERMIT REQUIRED CONFINED SPACE
A permit required confined space has one or more of the following characteristics:

- Contains or has a potential to contain a hazardous atmosphere.
- Contains a material that has the potential for engulfing an entrant.
- 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.
- Contains any other recognized serious safety or health hazards including engulfment in solid or liquid material, electrical shock, moving parts, impair the ability to self rescue, or presents of an immediate danger to life or health.

PERMIT-REQUIRED CONFINED SPACE PROGRAM
The employer's overall program for: documenting, controlling, and appropriately protecting employees from permit-required confined spaces and for regulating employee entry into permit-required confined spaces.

PROHIBITED CONDITION
Any condition prohibited by the permit during the period when entry is authorized.

PURGE
To remove and make clean or pure; or to rid of what is considered undesirable.

RECORDS
Records of entry exposures are considered medical in nature & must be maintained for a period of not less than 30 years after a staff member leaves employment.

RESCUE SERVICE
The personnel designated to rescue entrants from confined spaces.

RETRIEVAL SYSTEM
Equipment, consisting of self retracting life lines, retrieval lines, full-body harness, wristlets, if appropriate, and a lifting device or anchor) used for non-entry rescue of persons from confined spaces.

SELF RESCUE
An attendant is always present during confined space entries, therefore; the attendant should initiate the rescue process. However, the entrant may be physically able to remove his/her self from a space unassisted, while being monitored or by the attendant.

TESTING
Monitoring, evaluating and recording of hazards unique to confined space. These are identified and evaluated. Testing includes specifying the tests that are to be performed in the permit space, and recording the data.

Note: *Testing enables employers both to devise and implement adequate control measures for the protection of authorized entrants and to determine if acceptable entry conditions are present immediately prior to, and during, entry.*

APPENDIX

Appendix A - Confined Space Entry Checklists

CONFINED SPACES

- ❑ Park vehicles as a warning device and job site protection.
- ❑ Ensure attendant and entrant(s) are wearing safety equipment.
- ❑ In case of emergency, ensure emergency access. If needed set up traffic control measures.
- ❑ Ensure Emergency Rescue Communication is accessible.
- ❑ Assess the surroundings & eliminate the hazards prior to entry.
- ❑ Ensure safety and rescue equipment is available and used.
- ❑ Ensure a second person is always present to initiate a rescue for permit required confined spaces.
- ❑ Ensure work equipment is available and easily accessible.
- ❑ The testing of the atmospheres and any measures taken to enter the confined space are considered medical in nature, listing exposures to people, and shall be recorded and kept at the district office for a period of not less than 30 years. Use a multi gas monitor to verify that the atmosphere is safe, and continuously check the air quality.
  1. If the atmospheric testing monitor goes into alarm, ventilate for at least 15 minutes, then retest.
  2. If non-explosive gas is detected on second test, with ventilator operating, carefully remove hose and close the access cover. Notify your supervisor immediately.
- ❑ Remove access cover.
- ❑ Set up fall protection equipment.
- ❑ Ventilate.
- ❑ Complete Confined Space Entry Permit.
- ❑ Ensure Confined Space Entry Permit is located outside the space.

MANHOLE ENTRY PROCEDURES

1. Apply proper traffic control-if needed.
2. Check atmosphere before removing manhole/cover.
3. All testing of the atmosphere and any measures taken to enter the confined space, shall be recorded and kept at the district office.
4. Remove the manhole lid.
   - Set up for access.
   - Ventilate.

Entry procedures:

1. Use a "multi gas monitor" to verify that the atmosphere is safe, and continuously check the air quality.
2. Set up tripod and lifeline.
3. Ventilate confined space with ventilated blower if necessary.
4. Hard hat and protective clothing shall be worn when entering a manhole.

MANHOLE ENTRY CHECKLIST

- ❑ Park vehicles as a warning device and job site protection.
- ❑ In case of emergency, ensure emergency access.
- ❑ Set up traffic control measures.
- ❑ Ensure Emergency Rescue Communication is accessible.
- ❑ Assess the surroundings for hazards
- ❑ Ensure safety and rescue equipment is available and used.
- ❑ Ensure work equipment is available and easily accessible.
- ❑ Ensure a second person is present to initiate a rescue call
- ❑ Test the confined space atmosphere through manhole/cover. Testing of the atmospheres, and any measures taken to enter the confined space, shall be recorded and kept at the district office. Use a multi gas monitor to verify that the atmosphere is safe, and continuously check the air quality.

  1. If monitor goes into alarm, ventilate for at least 15 minutes, then retest.
  2. If non-explosive gas is detected on second test, with Ventilator/Blower operating, carefully remove hose and close the access cover. Notify your supervisor immediately.
- ❑ Remove access cover.
- ❑ Ventilate.

WAC/RCW

296-809-700 Non-permit confines requirements
296-809-500 Summary
296-809-50010 Provide, maintain and use proper equipment
296-809-50012 Evaluate and control hazards for safe entry
296-809-50014 Rescue and emergency services

Recognition Checklist

WASHINGTON STATE DEPARTMENT OF LABOR & INDUSTRIES
INTERNAL SAFETY AND HEALTH PROGRAM
CONFINED SPACE AND PERMIT-REQUIRED CONFINED SPACE
RECOGNITION CHECKLIST - S&H POLICY ISH 8.17 - Appendix A

This checklist is intended to provide assistance in determining as to whether a space is either a confined space or a permit-required confined space (PRCS).

Part I

1)	Is the space large enough so an employee can bodily enter and perform work?	Yes	❑	No	❑
2)	Does the space have limited or restricted means for entry and exit?	Yes	❑	No	❑
3)	Has the evaluation determined that the space is ***not*** designed for occupancy?	Yes	❑	No	❑

If the answer is yes to all items in Part I, continue to Part II. If the answer is no to any of the above items, the space is not considered a confined space and no further action is needed.

Part II

1)	Does the space contain or potentially contain a hazardous atmosphere?	Yes	❑	No	❑
2)	Does the space contain any chemicals or chemical residues?	Yes	❑	No	❑
3)	Does the space contain any flammable/combustible substances?	Yes	❑	No	❑
4)	Does the space contain or potentially contain any decomposing organic matter?	Yes	❑	No	❑
5)	Does the space have any pipes which bring chemicals into it?	Yes	❑	No	❑
6)	Does the space have any materials that can trap or potentially trap, engulf, or drown an entrant?	Yes	❑	No	❑
7)	Is vision obscured by dust at 5 feet or less?	Yes	❑	No	❑
8)	Does the space contain any mechanical equipment servicing the space?	Yes	❑	No	❑
9)	Does the space have converging walls, sloped floors or tapered floor to smaller cross-sections which could trap or - asphyxiate an entrant (Entrapment Hazard?	Yes	❑	No	❑
10)	Does the tank or vessel contain rusted interior surfaces?	Yes	❑	No	❑
11)	Does the space contain thermal hazards (e.g.; extreme hot or cold?	Yes	❑	No	❑
12)	Does the space contain excessive noise levels which could interfere with communication with an attendant?	Yes	❑	No	❑

Confined Space and Permit-Required Confined Space Checklist
Page 2

Part II (continued)

Recognition Checklist
-Continued-

13)	Does the space present any slip, trip, or fall hazards?	Yes	❑	No	❑
14)	Are there any operations conducted near the space opening which could present a hazard to entrants?	Yes	❑	No	❑
15)	Are there any hazards from falling objects?	Yes	❑	No	❑
16)	Are there lines under pressure servicing the space	Yes	❑	No	❑
17)	Are cleaning solvents or paints going to be used in the space?	Yes	❑	No	❑
18)	Is welding, cutting, brazing, riveting, scraping, or sanding going to be performed in the space?	Yes	❑	No	❑
19)	Is electrical equipment located in or required to be used in the space?	Yes	❑	No	❑
20)	Does the space have poor natural ventilation which would allow an atmospheric hazard to develop?	Yes	❑	No	❑
21)	Are there any corrosives which could irritate the eyes in the space?	Yes	❑	No	❑
22)	Are there any conditions which could prevent any entrants' self rescue from the space?	Yes	❑	No	❑
23)	Are there any substances used in the space which have acute hazards?	Yes	❑	No	❑
24)	Is mechanical ventilation needed to maintain a safe environment?	Yes	❑	No	❑
25)	Is air monitoring necessary to ensure the space is safe for entry due to a potential hazardous atmosphere?	Yes	❑	No	❑
26)	Will entry be made to a diked area where the dike is 5 feet or more in height?	Yes	❑	No	❑
27)	Are residues going to be scraped off the interior surfaces of the vessel?	Yes	❑	No	❑
28)	Are non-sparking tools required to remove residues?	Yes	❑	No	❑
29)	Does the space restrict mobility to the extent that it could trap an entrant?	Yes	❑	No	❑
30)	Is respiratory protection required because of a hazardous atmosphere?	Yes	❑	No	❑

Confined Space and Permit-Required Confined Space Checklist
Page 3

Part II (continued)

31)	Does the space present a hazard other than those noted above which would make it a permit space?	Yes	❑	No	❑

If any of the questions in Part II have been checked yes, the confined space is a permit-required confined space. As such, entry into these spaces must be performed under the protection of a full permit-required confined space program. **Note:** In some situations, alternative procedures or reclassifying to a non-permit space may be possible in lieu of a full permit-required confined space program.

2