



Delaware County Regional Sewer District Standard Operating Procedure

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Confined Space Program	November 12 th 2014	New	1	25

1.0 Purpose

- 1.1 The purpose of the Delaware County Regional Sewer District (DCRSD) Confined Space Program is to set procedures that will ensure workers safe entry into confined spaces and to perform routine tasks associated with their employment. This procedure is designed to provide the minimum safety requirements in accordance with the Occupational Safety and Health Administration's (OSHA) Confined Space Standard 1910.146.

2.0 Background

- 2.1 A confined space is defined as any location that has limited openings for entry and exit, is not intended for continuous employee occupancy, and is large enough and so configured that an employee can bodily enter and perform assigned work. Examples of confined spaces include: manholes, stacks, pipes, storage tanks, trailers, tank cars, pits, sumps, hoppers, and bins. Entry into confined spaces without following proper procedures could result in injury, impairment, or death due to:

- An atmosphere that is flammable or explosive;
- Lack of sufficient oxygen to support life;
- Contact with or inhalation of toxic materials;
- General work area hazards including engulfment and entrapment.

3.0 Definitions

- 3.1 **Acceptable Entry Conditions** - The conditions that must exist in a permit required confined space to allow entry and ensure that employees involved with a permit required confined space can safely enter into and work within the space.
- 3.2 **Asphyxiant** - A class of dangerous gases that displace oxygen and cause unconsciousness or death by suffocation (asphyxiation).
- 3.3 **Authorized Attendant** - An individual stationed outside a permit required confined spaces who monitors the authorized entrants and who performs the duties assigned in the DCRSD confined space program.
- 3.4 **Authorized Entrant** - An employee who is authorized by the employer to enter a permit space.
- 3.5 **Blanking or Blinding** - Absolute closure of a pipe, line or duct, by fastening across its bore a solid plate or cap that completely covers the bore, extends at least to the outer edge of the flange, and can withstand maximum upstream pressure.
- 3.6 **Confined Space** - Any space that meets all of the following conditions:
- Is large enough and so configured that an employee can bodily enter and perform assigned work;
 - Is not designed for continuous human occupancy;
 - Has limited or restricted means of entry or exit.

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- 3.7 **Contractor**- A company or person hired by the employer to perform services and/or work under a formal contract or agreement, supplying labor and materials.
- 3.8 **Cardiopulmonary Resuscitation**- Is an emergency procedure in which the heart and lungs are made to work by manually compressing the chest overlying the heart and forcing air into the lungs. (CPR) is used to maintain circulation when the heart stops pumping, usually because of disease, drugs, or trauma.
- 3.9 **Double Block and Bleed** - Closure of a line, duct or pipe by closing and locking or tagging a drain or vent which is open to the atmosphere in the line between two locked-closed valves.
- 3.10 **Emergency** - The occurrence (including any failure of hazard control or monitoring equipment) of events internal or external to the permit space that could endanger entrants.
- 3.11 **Employer**- The Board of Commissioners of Delaware County, Ohio or its administrative agency, Delaware County Regional Sewer District
- 3.12 **Engulfment** - The surrounding and effective capture of a person by a liquid or finely divided (flowable) solid substances that can be aspirated to cause death by filling or plugging the respiratory system, or materials that can exert enough force on the body to cause death by strangulation, constriction, or crushing.
- 3.13 **Entrapment** - The trapping of an employee or worker by inwardly converging walls or by a floor that slopes downward and tapers to smaller cross sections.
- 3.14 **Entry Supervisor** - The person responsible for determining if acceptable entry conditions are present for overseeing entry operations and terminating entry.
- 3.15 **Entry** - The action by which a person passes through an opening into a permit required confined space. Entry is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.
- 3.16 **PRCS Entry Team** - Is a group of employees assigned to complete a task within a permit required confined space. A typical entry team consists of an entry supervisor, entrant, attendant, and a lookout if required.
- 3.17 **Hazardous Atmosphere** - Hazardous atmosphere poses risk of death, incapacitation, and impairment of self-rescue ability, injury or illness from:
- Flammable gas, vapor, or mist >10% LEL;
 - Combustible dusts exceeding its LEL (obscures vision at distance of 5 feet);
 - Oxygen below 19.5% or above 23.5%;
 - Chemical/physical hazards exceeding Permissible Exposure Limits;
 - IDLH (Immediately Dangerous to Life or Health) atmospheres.

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- 3.18 **Hot Work** - Work involving welding, burning, open flame, sparks or temperatures that could ignite combustible materials.
- 3.19 **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 required confined space.
- 3.20 **Lock Out/Tag Out**- Is the common term for OSHA's Control of Hazardous Energy Standard. Lockout/Tagout practices protect employees by preventing accidental machine startup through proper locking and labeling of machines that are undergoing maintenance.
- 3.21 **Lookout** - An individual stationed outside a confined space who assists the attendant in monitoring the authorized entrants. The lookout is responsible for gathering tools, materials, etc. for the project that is in progress in the confined space.
- 3.22 **Non-Entry Rescue** - The non-entry rescue is the next best approach when the self-rescue is not possible because non-entry rescue can be started right away and prevents additional personnel from being exposed to unidentified and/or uncontrolled confined space hazards.
- 3.23 **Non-Permit Required Confined Space (NPRCS)** - A space meeting the definition of a confined space and where all the following conditions apply:
- Does not contain, with respect to atmospheric hazards or have the potential to contain any hazard capable of causing death or serious physical harm;
 - All potential hazards have been removed from the space;
 - Monitoring and inspection data are available and documented, which support the items above.
- 3.24 **NPRCS Entry Team**- Is the employees assigned to complete a task within a non-permit required confined space. The team shall consist of two employees at a minimum.
- 3.25 **Self-Rescue** - The self-rescue plan provides entrants with the best chance of escaping a permit space when hazards are present.
- 3.26 **Oxygen Deficient** - An atmosphere containing less than 19.5% oxygen.
- 3.27 **Oxygen Enriched** - An atmosphere containing greater than 23.5% oxygen.
- 3.28 **Permissible Exposure Limit** - Occupational exposure standards for the length and concentration of personal exposure to certain compounds or elements. Limits are usually expressed by concentration in parts per million (ppm) and have been established for gases and dusts. Refer to 29CFR 1910.1000 Tables Z-1 and Z-2.
- 3.29 **Permit Required Confined Space (PRCS)** - A confined space that has one or more of the following characteristics:
- Contains or has the potential to contain hazardous atmospheres.
 - 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 hazard

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- 3.30 **Permit System** - The DCRSD's written procedure for preparing for a confined space entry, identifying all hazards and for returning the permit required confined space to service following termination of entry.
- 3.31 **Personal Protective Equipment-** Any type of safety equipment that workers wear or use to prevent injury in the workplace. (PPE) includes, but not limited to, safety glasses, hard hats, gloves, boots, and specific clothing.
- 3.32 **Prohibited Condition** - Any condition in the permit required confined space that is not allowed by the permit during the period when entry is authorized.
- 3.33 **Purge** - Complete air exchange in a confined space prior to entry, which is designed to remove contaminated air and replace with fresh air.
- 3.34 **Rescue Service** - Outside services (local fire department) designated to rescue personnel from permit required confined spaces.
- 3.35 **DCRSD Rescue Team** - Sewer District employees that have been designated to provide rescue and emergency services in permit required confined spaces, have been trained with proper PPE needed to perform permit space rescue and at least one member is certified in first aid and CPR.
- 3.36 **Retrieval Systems** - Equipment used for non-entry rescue of persons from confined spaces consisting of the following items:
- Cable, of at least 1/2 inch diameter and capable of withstanding 5000-pounds test and fiber rope withstanding 9000-pounds. The line shall be equipped with fittings for attachment to a safety harness and shall be of a length that permits attachment to a hoisting device, or to an anchor point located outside the entry portal to the confined space;
 - A hoisting device, winch, or similar mechanical device of specific design for human use to permit an employee to safely enter and/or be removed through a top-opening of a confined space;
 - A full-body harness used for top entry into confined spaces where a vertical free fall hazard exists and where personnel retrieval may be necessary;
 - Wristlets & Anklets may be utilized where it is determined by the entry supervisor that the use of a harness would create an additional hazard to the entrant due to space configuration.
- 3.37 **Testing** - The process by which the hazards that may confront an entrant of a permit required confined space are identified and evaluated. Testing includes specifying the tests to be performed in the permit space.
- 3.38 **Ventilation** - To administer an adequate supply of non-contaminated fresh air, with 21% oxygen from an outside source, during the duration of the entry.

4.0 Authority/Responsibility

- 4.1 **Director** - Shall have the overall responsibility for these procedures:
- Support and ensure that all elements of procedure are implemented completely for the protection of all employees and ensure the policy is adequately enforced;
 - Make the final determination of whether or not DCRSD employees will be permitted to enter *PRCS, NPRCS, and Non-Regulated Spaces*.
- 4.2 **Operations Superintendent-** Shall have the responsibility for these procedures:

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- Oversee the space identification/classification process;
- Conduct confined space assessment for all new or significantly modified spaces;
- Establish a mechanism to ensure the confined space program elements are being performed, including:
 - Coordination of *entrant, attendant, and entrant supervisor* required training;
 - Ensure that no unauthorized *employee* will enter or be exposed to a *PRCS* or *NPRCS*;
 - Assist the *Joint Health and Safety Committee* in annual review of the program's overall effectiveness and recommend modifications as deemed necessary;
 - Ensure *managers* are performing their responsibilities defined in this procedure;
 - Ensure that the overall program effectiveness is evaluated annually;

4.3 ***Joint Health and Safety Committee (JHSC)*** - Shall ensure the following is performed and documented:

- A list of confined spaces at all *DCRSD* locations is maintained;
- Canceled permits are reviewed for lessons learned;
- Training of personnel is conducted;
- Coordination with outside responders is facilitated;
- Equipment is checked for compliance with standards.

4.4 ***DCRSD Manager*** -The Manager shall:

- Approve all *PRCS and NPRCS* entries;
- Assist in responding to any *employee* concerns and/or exposure potentials that they have identified in their areas;
- Ensure confined space training is provided for *affected employees* in their department;
- Notify the *Operations Superintendent/JHSC* of any employee concerns and/or exposure potentials that they have identified in their areas;
- Notify the *Operations Superintendent/JHSC* of any significant equipment modification/upgrade/addition that can be expected to create a new *PRCS* or substantially modify an existing confined space;
- Ensure all pre-entry conditions are met and entry permits are reviewed prior to entry;
- Ensure the confined space entry permit is completed and maintained at the worksite during confined space entry operations;
- Provide timely follow-up to *employee* concerns;
- Retain and maintain program documentation;
- Coordinate emergency response activities per this program;
- Coordinate with contractors to ensure proper procedures are being followed per this program.

4.5 ***Entry Supervisor – OSHA 1910.146 (j)*** the *entry supervisor* shall be qualified and authorized to approve confined space entry permits and shall:

- Ensure the requirements for entry have been completed before the entry is authorized. Ensure that the confined space monitoring is performed by qualified personnel who are trained in confined space entry procedures. Note: A list of monitoring equipment and personnel qualified to operate the equipment is maintained by the *JHSC*;
- Know the hazards that may be faced during entry, including the mode (how the contaminant gets into the body), signs or symptoms, and consequences of exposure;
- Complete the permit;
- Determine the entry requirements;

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- Notify all *entrants* and *affected employees* of the permit requirements;
- Post the permit in a conspicuous location near the portal of the space;
- Renew the permit or have it reissued as needed (a new permit is required every shift);
- Determine the number of *entrants* and *attendees* required to perform the work;
- Ensure *attendant(s)* know how to communicate with the *entrants* and how to obtain assistance;
- Post any required barriers and signs;
- Remain alert to changing conditions that might affect the conditions of the permits (i.e., require additional air quality monitoring or changes in personal protective equipment);
- Ensure periodic atmospheric monitoring is done according to permit requirements;
- Ensuring that necessary information on chemical hazards is kept at the worksite for the *employees* or rescue team;
- Ensure personnel doing the work and all support personnel adhere to permit requirements;
- Cancel the permit when the work is complete;
- Ensure the confined space is safely closed and all workers are cleared from the area.

4.6 **Attendant – OSHA 1910.146 (i)** the *attendant* shall be stationed outside the permit area and shall:

- Determine if conditions are acceptable for entry;
- Authorize entry and oversee entry operations;
- Terminate entry procedures as required;
- Ensure measures are in place to keep *unauthorized personnel* clear of the area.
- Ensure that a *rescue team* is available and instructed in their rescue duties (i.e., an onsite team or a prearranged outside rescue service);
- Ensure that the *entry team* members have current certification in first aid and cardiopulmonary resuscitation (CPR);
- Be knowledgeable of and be able to recognize potential confined space hazards;
- Maintain a sign-in/sign-out log with a count of all persons in the confined space, and ensure all entrants sign in and out on permit;
- Monitor surrounding activities to ensure the safety of personnel;
- Maintain effective and continuous communication with personnel during confined space entry, work, and exit;
- Order personnel to evacuate the confined space if needed;
- Observes a condition which is not allowed on the entry permit:
 - Notices the entrants acting strangely, possibly as a result of exposure to hazardous substances;
 - Notices a situation outside the confined space which could endanger personnel;
 - Notices a hazard within the confined space that has not been previously recognized or taken into consideration;
 - Must leave his/her work station;
 - Must focus attention on the rescue of personnel in some other confined space being monitored;
- Immediately summon the *rescue team* if rescue crew becomes necessary;
- Immediately summon the local *Fire Department/EMS* by dialing 911;
- Keep unauthorized persons out of the confined space, order them out, or notify authorized personnel of an unauthorized entry.

4.7 **Lookout (2nd PRCS attendant -NPRCS attendant (if fall protection is required))** - An individual stationed outside a confined space who monitors the authorized entrants. Lookouts shall:

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- Know the hazards faced during entry and the symptoms and consequences of exposures to authorized entrants;
- Ensure that all individuals who enter or leave the confined space are continually accounted for and have signed in or out on permit;
- Remain outside the confined space during entry operations until relieved by another qualified lookout;
- Continuously monitor activities inside and outside the space to determine if it is safe for entrants to remain in the space;
- Order authorized *entrants* to evacuate the confined space immediately when a hazard arises;
- Summon rescue services when authorized *entrants* may need assistance to escape from confined space hazards;
- Keep unauthorized *entrants* from entering the confined spaces;
- Assist in supplying tools and necessary materials required by *entrants*.

4.8 ***DCRSD Rescue Team - OSHA 1910.146 (k) (2)*** The *rescue team* members shall:

- Complete a training drill using mannequins or personnel in a simulation of the confined space prior to the issuance of an entry permit for any confined space and at least annually thereafter;
- Respond immediately to rescue calls from the *attendant or lookout* or any other person recognizing a need for rescue from the confined space;
- In addition to emergency response training, receive the same training as that required of the authorized entrants;
- Have current certification in first aid and CPR.

4.9 ***Entrants – OSHA 1910.146 (h)*** Employees who are granted permission to enter a confined space shall:

- Read and observe the entry permit requirements;
- Remain alert to the hazards that could be encountered while in the confined space;
- Properly use the personal protective equipment that is required by the permit;
- Immediately exit the confined space when:
 - They are ordered to do so by an *attendant, lookout or entry supervisor*.
 - They notice or recognize signs or symptoms of exposure.
 - A prohibited condition exists.
 - The air quality meter alarm sounds.
 - Alert *attendant(s)* when a prohibited condition exists and/or when warning signs or symptoms of exposure exist.

4.10 ***Employee*** - has the responsibility and right to:

- Notify his/her *manager* immediately of any adverse or unanticipated reactions/incidents occurring during or after entering a confined space;
- Notify his/her *manager* if he/she has ANY safety concerns or notices any unsecured *PRCS or NPRCS* conditions or procedures;
- Not enter any confined space unless authorized and entry is performed as written in the procedures outlined in this program.

5.0 Evaluation of Confined Spaces-OSHA 1910.146 (c) (1-4)

- 5.1 ***Delaware County Regional Sewer District (DCRSD)*** shall evaluate the workplace to determine if any spaces are permit-required confined spaces. If the workplace contains permit spaces, the *employer* shall inform exposed employees.

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5.1.1 The *Operations Superintendent* shall ensure a survey of all *DCRSD* facilities is conducted to identify confined spaces. The *DCRSD* Confined Space Evaluation Form shall be used during the survey. The survey shall be performed by all *DCRSD Managers* and the *Operations Superintendent*, full participation is mandatory. The purpose of the survey is to develop an inventory of those locations and/or equipment in the *DCRSD* that meet the definition of a confined space. This information shall be communicated to personnel and appropriate confined space procedures shall be followed prior to entry.

5.1.2 The Confined Space Evaluation Form first determines if the area under evaluation is a Confined Space or a Non-Regulated Space. All three of the following questions must be answered “yes” for the area to be a confined space. If all three questions are not yes, then it shall be a non-regulated space.

Confined Space Criteria

1. Is the space large enough or configured to permit bodily entry?
2. Is the space not designed for continuous occupancy?
3. Are there limited or restricted means of entry or exit?

5.1.3 **Entry-Exit Evaluation Criteria:** If access is any more difficult than walking through an ordinary door or walking up an ordinary flight of stairs, it is to be considered limited.

All ladders used for entry-exit including, extension, step, or fixed shall always be considered a limited means of ingress and egress. Flights of stairs that meet general building standards could be considered as limited means of entry-exit when the conditions or physical characteristics of the space, in light of the hazards present in it, would interfere with an *entrant’s* ability to exit or to exercise the self-rescue method in a hazardous situation.

Thus, a pit, manhole or tank that is entirely open on one plane can be considered a confined space if the means for entering the space (stairway, ladder, etc.) are narrow, twisted, or otherwise configured in such a way that would hinder an *entrant’s* ability to quickly escape. Similarly, the pit, or tank itself may be confining because of the presence of pipes, ducts, baffles, equipment, or other factors that would hinder an *entrant’s* ability to escape.

5.1.4 The Confined Space Evaluation Form then determines if there are any other hazards. If any one of the following four questions is answered “yes”, then it will be classified as a permit required confined space. If all four questions are answered “no” it shall be classified a non-permit required confined space.

1. Is there a potential or actual hazardous atmosphere?
2. Is there a potential for engulfment or entrapment?
3. Is the internal configuration such that an entrant may be trapped or asphyxiated?
4. Does the space contain any other safety or health hazards?

5.1.5 **Classification of Confined Space Type** - Each work area shall be classified as one of three types of spaces as follows:

- Permit Required Confined Space (*PRCS*)

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- Non-Permit Required Confined Space (*NPRCS*)
- Non-Regulated Space (*NRS*)

5.1.6 ***Signage-OSHA 1910.146 (c) (2)***

Upon completion of the evaluation of each work area, the Confined Space Evaluation Forms shall be signed and dated by each survey participant and the forms shall be maintained as a permanent record by the *Joint Health and Safety Committee*. In conclusion, all permit required confined spaces shall have signs identifying them as such. Signs shall be maintained in a legible condition. The signs shall contain a warning that a permit is required before entry. Access to all PRCS shall be prominently marked.

5.1.7 ***Employee Participation-OSHA 1910.146 (l) (1-2)***

- *Employer* must consult with affected *employees* or their authorized representative on development and implementation of all aspects of the permit space program;
- *Employer* must make available to affected *employees* or their authorized representatives all information required to be developed;

5.1.8 ***Employee's right for Re-evaluation of spaces -OSHA 1910.146 (d) (5) (v)***

If the *employee* has reason to believe that the evaluation of the space may not have been adequate, the *employer* shall re-evaluate the space in their presence.

5.2 ***Reclassification of Confined Spaces-OSHA 1910.146 (c) (7)*** - A *PRCS* can be reclassified to a *NPRCS* if **all** of the following four hazards have been removed from the confined space:

- A potential or actual hazardous atmosphere;
- A potential for engulfment or entrapment;
- The internal configuration such that an entrant may be trapped or asphyxiated;
- A space with the presence of other safety or health hazards, such as chemical, electrical, mechanical, thermal.

5.2.1 ***Reclassification*** of a *PRCS* shall be done by the *PRCS entry team* or the *NPRCS entry team* planning the work in the area to be reclassified. *The DCRSD Non-Permit Required Confined Space Reclassification Form 1910.146 (c)(7) (iii)* shall be used to reclassify a *PRCS* to a *NPRCS*. If the hazard returns, the work area must be reclassified as a *PRCS 1910.146 (c) (7) (iv)*.

IF IT IS NECESSARY TO ENTER THE PERMIT SPACE TO ELIMINATE HAZARDS, SUCH ENTRY SHALL BE PERFORMED AS A PRCS 1910.146 (c) (7) (ii).

CONTROL OF ATMOSPHERIC HAZARDS THROUGH FORCED AIR VENTILATION DOES NOT CONSTITUTE ELIMINATION OF HAZARDS 1910.146 (c) (7) (ii).

5.3 ***Non-Permit Required Confined Space*** - Refer to Sections 3.23 and 5.2 of this procedure for the definition of a Non-Permit Required Confined Space. A work area that has been evaluated as a *NPRCS* or has been reclassified as a Non-Permit Required Confined Space may be entered by following the procedures set forth in section 21 of this Standard Operating Procedure.

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THE DCRSD WILL REQUIRE A MINIMUM OF 2 EMPLOYEES PRESENT DURING NON-PERMIT REQUIRED CONFINED SPACE ENTRIES. (A LOOKOUT WILL BE REQUIRED WHEN FALL PROTECTION IS REQUIRED)

- 5.4 ***Non-Regulated Space*** - Other than general safety procedures applicable to the work being performed, there are no restrictions required to work in Non-Regulated Space.
- 5.5 ***The Director of Environmental Services - OSHA 1910.146 (c) 4*** - Has determined in accordance to the confined space evaluations that all confined spaces throughout the Regional Sewer District identified as “Permit Required Confined Space” and “Non-Permit Required Confined Space” may be required to be entered for preventative maintenance or necessary repairs and therefore shall be entered following the procedures set forth in sections 18 and 21 of this Standard Operating Procedure. Structures that have been identified are as follows:
- Aeration Tanks
 - Air Release Pits
 - Clarifiers
 - Digesters
 - Electrical Vaults
 - Filter Tanks
 - Flow Channels
 - Open Flow Channels
 - Sludge Holding Tanks
 - Sump Pits
 - Valve Pits
 - Wet Wells
- 5.6 ***The Director of Environmental Services- OSHA 1910.146 (c) 4*** - Has determined that all sanitary sewers cannot be controlled or contained and therefore shall be classified as “Permit Required Confined Space” at all times. All required entries shall follow the procedures set forth in section 18 of this Standard Operating Procedure.
- 5.7 ***The Director of Environmental Services- OSHA 1910.146(c) (5)(i)(A)*** - Has determined that said confined spaces located within the DCRSD cannot demonstrate that the only hazard posed is a potential hazardous atmosphere, therefore the alternate entry procedure 1910.146 (c) 5 is prohibited.
- 5.8 ***Confined Space Entry Approval*** - All entries shall be approved by the *DCRSD Manager*.

6.0 Confined Space Equipment- OSHA 1910.146 (d) (4)

- 6.1 ***DCRSD*** is required to provide the following equipment, (*sections 6.2 to 6.10*) at no cost to the *employees*. *DCRSD* is required to maintain equipment properly, and ensure that *employees* use that equipment properly. The confined space rescue retrieval equipment shall only be used for human rescue retrieval or fall protection unless authorized by the *JHSC*.
- 6.2 ***Confined Space Equipment Trailer*** - Shall be transported to all *PRCS* entries. The equipment trailer has been designed to maintain a complete inventory of equipment needed for each type of entry.
- 6.3 ***Equipment Failure*** - When any piece of equipment fails to operate correctly, all entrants shall evacuate the space until the equipment is repaired or replaced.

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6.4 ***Air Monitoring Equipment*** - The following equipment is to be used to determine if a hazardous atmosphere exists before entry into a confined space is allowed:

- A currently calibrated direct reading air quality meter;
- An air pump attachment with pump tube for the air quality meter (if necessary).

6.5 ***Rescue Retrieval and Fall Protection Equipment*** - The following equipment is to be used during entry into, while working in, and during exit from a confined space to retrieve the *entrant* in case of an emergency and to serve as fall protection while on a ladder:

- Full-body harness;
- Retrieval winch;
- Self-retracting lifeline;
- 3 Way- self-retracting lifeline with winch;
- Adjustable mast and various davit mounting devices or tripods;
- Extension ladders with hand-hold extensions.

6.6 ***Ventilation Equipment*** - To ventilate a hazardous atmosphere or to add fresh air into a non-hazardous atmosphere:

- Portable electric powered blowers;
- Flexible duct, as needed.

6.7 ***Personal Protective Equipment*** - Other types of personal protective equipment are available and are to be used as needed:

- Gloves
- Eye protection
- Hearing protection
- Hard hats
- Proper footwear
- Disposable coveralls
- Respiratory protection

6.8 ***Emergency Breathing Rescue Kits*** - Self-Contained Self Rescuer Kit (*SCSR*).

6.9 ***Lighting Equipment*** - Proper lighting to safely perform the work in a confined space is essential:

- High-output portable area lighting for tanks and wet wells;
- Battery powered lighting for confined spaces.

6.10 ***Barricades*** - Barricades and signage to caution other workers and the public of the confined space work area and to protect the confined space entry crew from pedestrian and vehicle traffic shall be used at all times:

- Traffic cones, barricades, caution tape;
- Signage identifying the confined space work zone;
- Temporary traffic control procedures may be required in or near roadway work zones

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7.0 Entry Permit - OSHA 1910.146 (e)

- 7.1 The requirement of the *entry permit* is to communicate to workers any potential hazards that may be identified and any controls that may be required before workers enters the confined space or performs related work with respect to the confined space. The entry permit is the most essential tool for assuring safety during entry into confined spaces with known hazards, or with unknown or potentially hazardous atmospheres.
- 7.2 The *entry permit process* guides the *managers* and *employees* through a systematic evaluation of the space to be entered. The permit should be used to establish appropriate conditions. Before each entry into a confined space, an *entry permit* shall be completed by the *entry team*. The *entry supervisor* shall then endorse the permit and communicate the contents of the permit to all employees involved in the operation, and post the permit conspicuously near the portal of the work location.
- 7.3 **Atmospheric testing** shall be conducted and the results should be within acceptable limits. If atmospheric test results are not within acceptable limits, precautions to protect entrants against the hazards should be addressed on the permit and should be in place.

DCRSD acceptable limits are as follows:

- Oxygen: 19.5 percent to 23.5 percent
 - Flammability: less than 10 percent of the Lower Flammable Limit (LEL)
 - Carbon monoxide: Not greater than 25 Parts Per Million (PPM)
 - Hydrogen Sulfide: Not greater than 10 PPM
- 7.4 **Changing Work Conditions** - A new permit shall be issued, or the original permit will be reissued, if possible, whenever changing work conditions or work activities introduce new hazards into the confined space. Only operations or work originally approved on the permit shall be conducted in the confined space.
- 7.5 **Scope and Duration** - A permit is only valid for one shift. For a permit to be renewed, the following conditions shall be met before each re-entry into the confined space:
- Atmospheric testing shall be conducted and the results should be within acceptable limits. If atmospheric test results are not within acceptable limits, precautions to protect entrants against the hazards should be addressed on the permit and should be in place.
 - The *entry team* shall verify that all precautions and other measures called for on the permit are still in effect.
 - Only operations or work originally approved on the permit shall be conducted in the confined space.
- 7.6 **Recordkeeping** - The *DCRSD Manager* shall retain each canceled entry permit for at least one (1) year to facilitate the review of the Confined Space Entry Program by the *JHSC*. Any problems encountered during an entry operation shall be noted on the respective permit(s) so that appropriate revisions to the confined space permit program can be made.

8.0 Hazard Assessment OSHA 1910.146 (d) (2)

- 8.1 Before any worker enters a confined space, the employer shall ensure that during the permit process an adequate *hazard assessment* related to the confined space has been carried out.

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8.2 A **hazard assessment** is critical to identifying the existing and potential hazards of the individual confined spaces, and of the hazards that may develop during the work activity inside the confined space. In addition to assessing the hazards that pose an imminent danger to the workers, the employer should also evaluate general safety hazards present in the space.

8.3 **Hazard elimination** is the primary goal; however, if this is not possible, hazard control shall be utilized. If identified hazards cannot be eliminated they must be **controlled** to ensure that workers are not endangered. The hazard assessment must be completed as a part of the entry permit process prior to any *employee* entering a confined space.

8.4 The assessment may identify the following hazards:

- Oxygen deficient/oxygen enrichment;
- Flammable, combustible or explosive agents;
- Toxic air contaminants, smoke, fumes and dusts;
- Residual chemicals/materials;
- Ignition hazards, including hot work, tools and other potential sources of ignition;
- Chemical contact hazards, including acids and alkalis;
- Physical Hazards, including mechanical hazards, thermal stress, humidity, noise and vibration, working/walking surfaces, engulfing materials, physical obstacles, poor visibility, and slips and falls;
- Electrical hazards, including lines and cables, exposed terminals;
- Traffic hazards, including pedestrians and mobile equipment;
- Biological hazards, including animals and biological agents;
- Other hazards related to the confined space, including piping, distribution systems, pressuring fluids and any type of uncontrolled energy (water, liquid, sludge, grit, vapors, electric, magnetic, gaseous, etc.), limited entry and exit.

8.5 No entry shall be permitted until the hazard assessment has been reviewed and discussed by all persons engaged in the activity (*PRCS-NPRCS Entry Team*). Personnel who are to enter confined spaces shall be informed of known or potential hazards associated with said confined spaces.

9.0 Hazard Controls - OSHA 1910.146 (f) (8)

9.1 **Hazard controls** shall be instituted to address changes in the work processes and/or working environment. "Hazard Controls" must be able to control the confined space hazards by following proper procedures including, but not limited to, isolation of confined space work area, ventilation/purging of a hazardous atmosphere, elimination of mechanical/uncontrolled energy, proper entry and exit procedures and the proper use of personal protective equipment to prevent the contaminants from coming into contact with the workers.

10.0 Opening a Confined Space - OSHA 1910.146 (c) (5) (ii) (B)

10.1 Any conditions creating a hazard by removing an entrance cover or gate opening shall be eliminated before the cover or the gate opening is made accessible for entry. This shall apply to all confined spaces including, but not limited to manholes, open top tanks, wet wells, valve pits and covered sludge digesters.

10.2 When entrance covers or gates are removed, the opening shall be promptly guarded by a railing, temporary cover, or other temporary barrier that will prevent anyone from falling into the opening. This barrier or cover shall protect each *employee* working in the space below from foreign objects

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entering the space. If it is in a traffic area, adequate barriers and signage shall be erected as defined in Part 6 of the Ohio Manual on Uniform Traffic Control.

11.0 Isolation and Control of Energy Materials - OSHA 1910.147

- 11.1 All energy sources that are potentially hazardous to confined space entrants shall be secured, relieved, disconnected, and/or restrained before personnel are permitted to enter the confined space. Equipment systems or processes shall be locked out and/or tagged out as required by the DCRSD Lockout and Tagout Standard Operating Procedure prior to permitting entry into the confined space.
- 11.2 Isolation methods to protect 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 may be required.
- 11.3 “Lockout/Tagout” will be required to protect the *employees* not only from equipment malfunction but also from the unexpected or accidental energization of equipment or machinery within a confined space. If there are multiple *entrants*, each worker shall have his own lock/tag or the department common lock may be used to ensure de-energization and to prevent re-energization of machinery by other *employees*.

12.0 Atmospheric Testing - OSHA 1910.146 (d) (5)

- 12.1 **Atmospheric testing** is required during the hazard assessment of the *PRCS* permit and the *NPRCS* reclassification form to determine if the confined space contains atmospheric hazards. The air quality testing must be done, continuously, prior and during work in a confined space. The atmosphere shall be tested with a direct reading, calibrated instrument. Air sampling pumps and tubes may be attached if necessary. Atmospheric testing should occur with the breaking of the plane of the space.
- 12.2 Identification of the potential atmospheric hazards should be done taking into consideration the previous contents of the space, the activities within the space that could stir up hidden air contaminants, the work task itself in the confined space that could generate air contaminants, and the potential of sudden release of air contaminants from the sources in proximity to the space.
- 12.3 Work to be done within the confined space (such as welding, degreasing, painting, cleaning) may produce toxic atmospheres. Toxic gases and vapors from adjacent areas can migrate to and collect in the confined space. Vapors may be released from the sludge and grit on the bottom or scales on the walls of emptied confined spaces, such as storage tanks, that previously contained toxic materials. Vapor release may be accelerated by floor and wall scraping and sludge removal from confined spaces.
- 12.4 **Atmospheric hazards** of concern include oxygen content outside the acceptable range of 19.5 to 23 %, the potential accumulation of flammables, combustibles, or explosive agents, or accumulation of atmospheric contaminants.
 - **Oxygen-deficient** means that there is not enough oxygen in the space to safely breathe. Normal air is made up of 20.9 percent oxygen compared to less than 19.5 percent in an oxygen-deficient atmosphere. Air that has less than 10 percent oxygen can cause unconsciousness and levels below 8 percent can quickly cause death.
 - **Oxygen-enriched** means there is too much oxygen. Air with over 23.5 percent oxygen can cause clothing, hair, and other flammable materials to burn violently when ignited.

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- **Flammable atmospheres** are caused by a mixture of dusts, gases or vapors that can explode or catch fire. The mixture cannot burn if there is not enough fuel (lean), or if there is too much fuel (rich).
- **Toxic gases and vapors** come from a wide variety of sources. Carbon monoxide, hydrogen sulfide, and methane are three of the most common and deadly gases that are naturally produced in confined spaces.
- **Carbon Monoxide (CO)** results from incomplete combustion processes in equipment such as gasoline engines. CO is a colorless and odorless gas that prevents uptake of oxygen in the blood and can cause headaches, dizziness, unconsciousness, asphyxiation and death. Carbon Monoxide is slightly lighter than air.
- **Hydrogen Sulfide (H₂S)** is encountered in sewers, sewage treatment plants, and other locations where organic material (dead animals, leaves, etc.) decomposes. It has a distinct odor of rotten eggs at low concentrations but can cause olfactory fatigue (a deadened sense of smell) at high levels. H₂S can block respiration, causing rapid loss of consciousness, and possible death. Hydrogen Sulfide is heavier than air.
- **Methane (CH₄)** is a natural gas produced from the decay of organic matter. It is flammable, explosive, colorless, and odorless gas. It can displace oxygen to the point of oxygen deficiency in a confined space, causing dizziness, unconsciousness, and asphyxiation. Methane is lighter than air.

12.5 **Working in a hazardous atmosphere** may expose *employees* to the risk of death, incapacitation, and impairment of ability to self-rescue (unaided escape from a permit space), injury or acute illness from one or more of the following causes:

- Presence of inert or other gases(displacement)
- Decomposing organic material (sludge)
- Rusting material (Pump Station valve vaults, Air release vaults)
- Combustion (dust or vapors)
- Drying paint (pipework)
- Uncured concrete (new manholes, tanks)

12.6 **Atmospheric testing- Prior to the PRCS-NPRCS Entry OSHA 1910.146 (d) (5) (i) -** Representative air sampling shall be conducted taking into consideration the presence of stratified atmospheres and pockets of air within the confined space. Gases may collect at different levels of the confined space based on their density. Air readings shall be collected in the confined space at a maximum of four foot increments, using 60 second intervals, vertically and horizontally, including corners and low spots, to ensure that all potential hazards are identified.

12.7 **Atmospheric testing- During the PRCS Entry OSHA 1910.146 (d) (5) (ii) -**Continuous atmospheric readings shall be monitored and recorded on Entry Permit at 15 minute intervals by the attendant. The direct reading instrument shall be attached to each entrant and located in their respective breathing zone. The *attendant* may monitor a tethered meter for redundancy, but shall not be used as the sole meter for the entry. If the alarm sounds, all *employees* are to evacuate the space immediately.

12.8 **Atmospheric testing- During the NPRCS Entry OSHA 1910.146 (c) (7) -** To confirm that all atmospheric hazards have been and remain eliminated for the *NPRCS* entry, prior and continuous atmospheric readings shall be required. During the entry, continuous atmospheric readings shall be monitored and recorded on the Reclassification Form at 60 minute intervals by the *entrants or lookout*. The direct reading instrument may be attached to one of the *entrants* or tethered to the top, but shall remain at all times in the breathing zones of the *entrants*.

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13.0 Control of Hazardous Atmospheres - Ventilation OSHA 1910.146 (c) (5) (ii) (E) (1-3)

- 13.1 **Ventilation** is one of the most (common engineering) controls used in confined spaces. When ventilation is used to remove atmospheric contaminants from a confined space, the space shall be ventilated until the atmosphere is within the acceptable ranges. Ventilation shall be maintained during the occupancy if there is a potential for the atmospheric conditions to move out of the acceptable range. When ventilation is not possible or feasible, alternate protective measures or methods to remove air contaminants and protect occupants shall be determined by the *DCRSD Manager* prior to authorizing entry.
- 13.2 If a hazardous atmosphere or other prohibited condition is detected prior to or during the entry, every employee is prohibited to enter or must evacuate the space immediately. The space shall be evaluated by the *entry team* to determine what and how the conditions developed, and what necessary measures can be taken to protect the employees before entering or returning to the space.
- 13.3 When forced air ventilation is required the following practices shall be observed:
- An *employee* cannot enter the space unless, and until, the forced air ventilation system has eliminated the hazardous atmosphere.
 - The forced air ventilation system shall be directed to ventilate the immediate area where the *employee* is expected to be in the space and shall continue until all employees have left the space.
 - The air supply for the forced air ventilation system shall be from a clean source and may not increase the hazards of the space.
- 13.4 If all efforts to identify and remove hazardous air fail, entry procedure and work required for the confined space shall be terminated.

14.0 Entry and Exit Safeguards-OSHA 1910.146 (d) (4) (vii – ix)

- 14.1 The DCRSD shall ensure that means for a safe entry and exit shall be provided for all confined spaces.
- Each entry and exit point shall be evaluated by the *JHSC* to determine the most effective methods and equipment that will enable employees to safely enter and exit the confined space.
 - *PRCS* entries will require that a mechanical device shall be available to retrieve personnel from vertical confined spaces greater than 5 feet in depth.
 - *PRCS* vertical suspension entries will require the combination of two 3-way self-retracting lifeline with winches to be used or, a combination of the 3-way self-retracting lifeline with winch and a retrieval winch, any combination of 3-way self-retracting lifelines and retrieval winches shall be used simultaneously whenever an employee enters the space.
 - *PRCS* ladder entries will require the 3-way self-retracting lifeline with winch independently or the combination of the retrieval winch and the self-retracting lifeline to be used simultaneously, whenever an employee enters the space, while the retrieval winch cable remains tethered to the entrant for the duration of the entry, the self-retracting fall lifeline can be detached.
 - *NPRCS* entries shall include the appropriate fall arrest protection equipment when an employee is exposed to a fall of 6 feet or more.
 - The appropriate self-retracting fall arrest lifeline-retrieval systems and ladder location shall be located at the portal of the confined space.
 - The devices shall be used as the entrant enters into the work area and exits the work area.

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15.0 Administrative Controls

- 15.1 The *DCRSD* will administer hazard controls which will be intended to eliminate or reduce the hazard through changes in the confined space work practices.
- 15.2 **One Entrant-One Meter** - During *PRCS* entries, each *entrant* shall be equipped with one direct reading meter during the duration of the confined space entry. *Entrants* are not to share meters, the purpose of individual meters will be to minimize the amount of individual worker exposure in the confined space area. Calculation of personal short term exposure limits (STEL) and time weighted averages (TWA) may be required during the post-entry procedures of each entry.
- 15.3 **Rotation of Workers** - Will occur when necessary during the *PRCS* entry. The *DCRSD* recognizes when working in excessive hot temperatures (summer time) and extremely cold temperatures (winter time), the *entrants* may need relief to maintain their physical and mental stability.
- 15.4 **Personal Protective Equipment** - Will be used during all entries that aid in the prevention of any chemical or biological hazard coming into contact with the employee. Chemical, Physical, and Biological Hazards often found in confined spaces are as follows:
- **Toxic chemicals** - chemicals from industrial plants or pesticides from farms or lawn use, or other sources can end up in the confined spaces in wastewater treatment facilities. Welding can produce dangerous fumes;
 - **Physical and safety hazards** - include but are not limited to loud noise, falls, becoming stuck in a tight spot, or being buried by material stored in the space;
 - **Biological hazards** – come mainly from contaminated water in the area. Diseases that workers can get from confined space work include, but are not limited to hepatitis, leptospirosis (Weil’s disease), staphylococci, salmonella, E. coli, and parasites.
- 15.5 **Safety Data Sheets OSHA 1910.146 (k)(4)** - If an injured *employee* is exposed to a substance for which a SDS or other similar written information is required to be kept at the worksite, that SDS or written information shall be made available to the medical facility treating the employee.

16.0 Hot Work-OSHA 1910.252

- 16.1 The completion of a hot work permit is mandatory when welding, burning, or brazing is to be conducted in a confined space.
- 16.2 Approved electrical equipment shall be used when operating in atmosphere which may be explosive. Non-sparking tools shall be used.
- 16.3 Welding and burning equipment, other than torches, hoses, and electrical welding leads, shall not be taken into the confined space. The gas cylinders or welding machines must be left outside of the space and chocked if on wheels.
- 16.4 When arc welding is suspended for any period of time exceeding 30 minutes, all electrodes shall be removed from the holders and the holders carefully located so that accidental contact cannot occur. The machine shall be disconnected from the power source.
- 16.5 When gas welding or cutting is suspended for any period of time exceeding 30 minutes, all torch valves shall be closed and the gas supply shall be shut off outside of the space.

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16.6 When welding or burning is required, it shall be completed as a PRCS entry, forced air ventilation is required. Oxygen shall never be used to ventilate a space.

16.7 The *entrants and attendants* shall wear suitable eye protection.

17.0 PRCS Pre-Entry Meeting- OSHA 1910.146 (d) (8)

17.1 Prior to the commencement of any *scheduled or emergency* work in a *PRCS*, the *entry team* shall be selected by the *DCRSD Manager*; however, in the absence of the *DCRSD Manager*, the trained authorized employees involved shall self-select the *entry team*. The meeting shall include the following topics:

- Assign the work zone responsibilities for the *entrant supervisor, entrant, attendant* and *lookout* if required (*PRCS Entry Team*);
- Discuss the type of structure, the scope of work to be performed, and an estimate of the time involved;
- Conduct a review of all equipment required, including personal protective equipment.
- Discuss the potential hazards;
- Verify requirement of any lockout/tag out procedures and assignment of personnel to complete the procedures;
- All *employees* shall have the opportunity to confirm that all pre-entry preparations have been completed and that all safety measures are followed according to this program **OSHA 1910.146 (c) (5) (ii) (H)**;
- DCRSD will require a minimum of *three trained employees* to be present and accept assigned duties at the PRCS Pre-Entry Meeting:

1. Entrant Supervisor
 2. Attendant
 3. Entrant(s)
- Lookout (optional)

ALL ENTRIES ARE PROHIBITED UNTIL THE ENTRY TEAM HAS BEEN ASSIGNED.
OSHA 1910.146 (d) (8)

18.0 Permit Required Confined Space Entry Procedures 1910.146 (d)

- 18.1 Entry into a permit required confined space requires the approval of the *DCRSD Manager*.(Section 5.8)
- 18.2 An (*Entry Supervisor, Attendant, Entrant and Lookout if necessary*) *entry team* shall be designated to participate in a pre-entry meeting for each *PRCS* entry. The *DCRSD* will require a minimum of 3 employees present during each *PRCS* entry. (Section 17.1)
- 18.3 All of the required safety equipment, based on the permit, must be on site and available. Equipment shall include, but is not limited to, blowers, full body harness, retrieval line, rescue tripod, direct reading air meters, davit masts and anchor bases and traffic control systems. (Section 6.2)
- 18.4 When the entrance cover or gate is removed, the opening must be promptly guarded using a railing, temporary cover, or other temporary barrier that will prevent a fall into the space and protect employees working in the space from objects entering the space. (Section 10.1)

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- 18.5 If applicable to the site, traffic control must be in place during entry procedures. (*Section 10.2*)
- 18.6 A Permit Required Confined Space Permit form shall be completed. (*Section 7.1*)
- 18.7 As a part of the permit process, a hazard assessment of the PRCS must be completed. (*Section 8.1-8.2-8.4-8.5-17.1*)
- 18.8 A survey of the air in the confined space is required prior to entry. An atmospheric direct reading instrument shall be used to monitor the confined space for oxygen content and lower flammable limit of any combustible gases that may be present, carbon monoxide and hydrogen sulfide. If any other hazardous substances are potentially present, monitoring and appropriate personal protection and controls must be implemented. Entrance into the confined space is not permitted under any circumstances until this has been addressed. (*Section 12.1- 12.6*)
- 18.9 The prior to entry atmospheric test results must be entered into the confined space permit checklist, the air must be continuously monitored and the results recorded using 15 minute intervals in the periodic atmospheric testing section of the confined space Entry permit throughout the entire entry procedure. (*Section 12.7*)
- 18.10 If a hazardous atmosphere is detected prior to and during the entry, ventilation shall occur. (*Section 13.1-13.2-13.3-13.4*)
- 18.11 Hazardous sources of energy that impact the work to be performed in a confined space must be identified, disconnected, tagged or locked out of operation. Please refer to the *DCRSD Lock Out/Tag Out Standard Operating Procedure*. (*Section 11.1*)
- 18.12 The *DCRSD* retrieval and fall protection equipment shall be used whenever an *authorized entrant* enters a *PRCS* when spaces are greater than 5 feet and 6 feet in depth respectively. (*Section 14.1*)
- 18.13 The *entry supervisor* shall complete and sign the confined space entry permit prior to the *entrants* entering the space. The following topics must be reviewed with the *entrant, attendant* and *lookout* prior to entry: permit conditions, hazard assessment, entry precautions, and rescue procedures. (*Section 7.2*)
- 18.14 The *entry team* shall collectively confirm that entry conditions are acceptable prior to entry. (*Section 17.1*)
- 18.15 The *entrant* must wear retrieval equipment and remain tethered during the entire entry operation. The *DCRSD* retrieval/fall protection systems shall be used whenever an *authorized entrant* enters the permit space. (*Section 24.2 & 24.4*)
- 18.16 If the safety equipment fails or if the space becomes immediately hazardous, an immediate evacuation of the space shall be ordered. (*Section 6.3*)
- 18.17 An effective means of communication between the *attendant and entrants* shall be used at all times. Proper hand signals, gestures and voice commands along with powered communication devices may be required when *entrants* are inside of the confined space, out of sight of the *attendant* or unable to communicate verbally with the *attendant*. If, at any time during the entry communication becomes difficult, the *entrants* must evacuate the confined space immediately and not re-enter until a functional method of communication is available. (*Section 4.6*)

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18.18 The *entry team* shall be prepared for an *Emergency Dispatch and Non-Entry Rescue*. –OSHA 1910.146 (K) (*Section 24.1-24.4*)

18.19 Upon completion of the required entry, when all *entrants* are removed and are on ground, the post-entry procedures shall be completed. (*Section 19.1*)

19.0 PRCS Post Entry Procedures- OSHA 1910.146 (d) (12)

19.1 Upon conclusion of the entry, the following procedures shall be followed:

- Upon completion of the work required, the *entrants* shall return to the ground, removed from the confined space immediately;
- The *entry team* shall remove all isolation control devices that may have been applied and return all equipment to previous operational status;
- The *entrant supervisor* shall close the permit by ensuring that all personnel are accounted for and that all Entrants have evacuated the space and have signed the permit closure section;
- The *entry team* shall dismantle all equipment required for entry, provide inspection, perform maintenance as required and relocate it to the appropriate location;
- The *entry team* shall cleanup work area;
- Report to *DCRSD Manager* to indicate that work has been completed and all equipment/operations can return to service;
- *Entry Supervisor* shall submit completed permit to *DCRSD Manager* for record;
- The *entry team* shall review the direct-reading meter to verify if any hazardous atmospheres have been experienced. Each meter shall be re-calibrated; data may be downloaded documenting actual peak readings, (STEL) and (TWA) that may have calculated on the meter during the entry. This shall remain the records of the Operations Superintendent/JHSC.

20.0 NPRCS Pre-Entry Meeting

20.1 Prior to the commencement of any *scheduled* or *emergency* work in a *NPRCS*, the *NPRCS entry team* shall be selected by the *DCRSD Manager*; however, in the absence of the *DCRSD Manager*, the trained authorized employees involved shall self-select the *NPRCS entry team*. The meeting shall include the following topic:

- Assign the responsibilities for the *entrants and lookout if fall protection is required*;
- Discuss the type of structure, the scope of work to be performed, and an estimate of the time involved;
- Conduct a review of all equipment required, including personal protective equipment;
- Discuss the potential hazards and ensure that all have been removed;
- Verify requirement of any lockout/tag out procedures and assignment of personnel to complete the procedures;
- All *employees* shall have the opportunity to confirm that all pre-entry preparations have been completed and that all safety measures are followed according to this program **1910.146 (c) (5) (ii) (H)**;
- DCRSD will require a minimum of *two trained employees* to be present and accept assigned duties at the NPRCS pre-entry meeting.

ALL ENTRIES ARE PROHIBITED UNTIL THE ENTRY TEAM HAS BEEN ASSIGNED. OSHA 1910.146 (d) (8)

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21.0 Non-Permit Required Confined Space Entry Procedures – OSHA 1910.146 (c) (7) (i-iv)

- 21.1 Entry into a confined space requires the approval of the *DCRSD Manager*. (*Section 5.8*)
- 21.2 The *entrants and lookout* (when fall protection is required) shall be designated to participate in a pre-entry meeting for each *NPRCS* entry. The *DCRSD* will require a minimum of 2 employees present during each *PRCS* entry. (*Section 20.1*)
- 21.3 A pre-entry hazard assessment must be completed to determine that no atmospheric hazard or oxygen deficient environment exists and that there is no other hazard associated with the space. (*Section 8.1, 8.2, 8.4, 8.5, 20.1*)
- 21.4 When the entrance cover or gate is removed, the opening shall be promptly guarded using a railing, temporary cover, or other temporary barrier that will prevent a fall into the space and protect employees working in the space from objects entering the space. (*Section 10.1*)
- 21.5 Entry into a *NPRCS* is allowable if certain criteria are met that determine no actual or potential atmospheric hazards exist and if all hazards within the space are eliminated without entry into the space. (*Section 5.2-5.2.1*)
- 21.6 A Confined Space Reclassification form shall be completed. (*Section 5.2.1*)
- 21.7 If it is necessary to enter the permit space to eliminate hazards, the entry must be carried out according to *PRCS* entry procedures in section 18 of this SOP (*Section 5.2.1*).
- 21.8 Upon completion of the work during a *PRCS* entry and once testing demonstrates that all hazards in the space have been eliminated, the permit space may be reclassified as a *NPRCS* for as long as the hazards remain eliminated. (*Section 5.2*)
- 21.9 The *NPRCS* shall be maintained in a safe condition for entry. (*Section 5.2.1*)
- 21.10 The prior to and continual entry gas test results must be entered into the reclassification form checklist, the air must be continuously monitored and the results recorded using 60 minute intervals. (*Section 12.8*)
- 21.11 Hazardous sources of energy that impact the work to be performed in a confined space must be identified, disconnected, tagged or locked out of operation. Please refer to the *DCRSD* Lock Out/Tag Out Standard Operating Procedure. (*Section 11.1*)
- 21.12 The *DCRSD* self-retracting fall arrest protection systems shall be used whenever an authorized entrant enters a *NPRCS* and is exposed to a fall of 6 feet. (*Section 14.1*)
- 21.13 The *NPRCS* entry team shall collectively confirm that entry conditions are acceptable prior to entry. (*Section 20.1*)
- 21.14 If any hazards return, the confined space shall become a permitted space and the employees shall immediately exit the space. The space shall be reevaluated prior to entry. (*Section 5.2.1*)
- 21.15 It is important to realize that a *NPRCS* might require reclassification based on the type of work to be performed. For example, a (hazard free) tank that has been re-classified from a *PRCS* to a *NPRCS*, in light of the scope of work that the employee is performing, that may

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include materials and chemicals including solvent, paint, etc. within the space, could be required to be reclassified back to a *PRCS*. (*Section 5.2.1*)

21.16 Post *NPRCS* Procedures (*section 22.1*)

22.0 NPRCS Post Entry Procedures

22.1 Upon conclusion of the *NPRCS entry*, the following procedures shall be followed:

- Upon completion of the work required, the *entrants* shall return to the ground, removed from the confined space immediately;
- The *NPRCS entry team* shall remove all isolation control devices that may have been applied and return all equipment to previous operational status;
- The *NPRCS entrant team* shall complete the reclassification form by ensuring that all personnel are accounted for and any comments are recorded;
- The *NPRCS entry team* shall dismantle all equipment required for entry, provide inspection, perform maintenance as required and relocate it to the appropriate location;
- The *NPRCS entry team* shall cleanup work area;
- Report to *DCRSD Manager* to indicate that work has been completed and all equipment/operations can return to service;
- *NPRCS entry team* shall submit completed Reclassification Form to *DCRSD Manager* for record;
- The *NPRCS entry team* shall review the direct-reading meter to verify if any hazardous atmospheres have been experienced. Each meter shall be re-calibrated; data may be downloaded documenting actual peak readings, (STEL) and (TWA) that may have calculated on the meter during the entry. This shall remain the records of the *JHSC*.

23.0 Training- OSHA 1910.146 (g) (1-4)

23.1 The *DCRSD* shall provide training so that all employees whose work is regulated by this Confined Space Program, to acquire the understanding, knowledge, and skills necessary for the safe performance of their duties in confined spaces.

23.2 **Training Frequency** - The *Operations Superintendent* shall assure that training is provided to all personnel affected by this procedure:

- Before the *employee* is first assigned duties within a confined space;
- Before there is a change in assigned duties;
- When there is a change in permit space operations that presents a hazard for which an *employee* has not been trained;
- When the *DCRSD* has reason to believe that there are deviations from the confined space entry procedures required in this Standard Operating Procedure, or that there are inadequacies in the *employee's* knowledge or use of these procedures.

23.3 The training shall establish *employee* proficiency in the duties required in this program and shall introduce new or revised procedures, as necessary, for compliance with this program.

23.4 **General Training** - All employees who will enter confined spaces shall be trained in entry procedures. Personnel responsible for supervising, planning, entering, or participating in confined space entry and rescue shall be adequately trained in their functional duties prior to any confined space entry. Training shall include:

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- Explanation of the general hazards associated with confined spaces.
- Discussion of specific confined space hazards associated with the facility, location, or operation.
- Reason for, proper use, and limitations of personal protective equipment and other safety equipment required for entry into confined spaces.
- Explanation of permits and other procedural requirements for conducting a confined space entry.
- A clear understanding of what conditions would prohibit entry.
- Procedures for responding to emergencies.
- Duties and responsibilities of the confined space entry team.
- Description of how to recognize symptoms of overexposure to probable air contaminants in themselves and co-workers, and method(s) for alerting the attendant(s).

23.5 **Refresher** training shall be conducted as needed to maintain employee competence in entry procedures and precautions.

23.6 **Specific Training**- Shall be provided for the *DCRSD* staff regarding specialized equipment and procedures as required by this SOP.

23.6.1 Training for *entry supervisors, attendants, lookouts and entrants* shall include proper use of monitoring instruments, including instruction on the following:

- Proper use of the equipment;
- Calibration of equipment;
- Sampling strategies and techniques; exposure limits (PELs, TLVs, LELs, UELs, etc.).

23.6.2 Training for *attendants* shall include the following:

- Procedures for summoning rescue or other emergency services;
- Proper utilization of equipment used for communicating with entry and emergency/rescue personnel.

23.6.3 Training for *DCRSD Emergency Response Personnel* shall include:

- Rescue plan and procedures developed for each type of confined space that is anticipated to be encountered;
- Use of emergency rescue equipment;
- First aid and CPR techniques;
- Work location and confined space configuration to minimize response time.

23.7 **Verification of Training**-Periodic assessment of the effectiveness of *employee* training shall be conducted by the *Operations Superintendent/ JHSC* through actual *PRCS and NPRCS* entry audits. Training sessions shall be repeated as often as necessary to maintain an acceptable level of personnel competence.

24.0 Emergency Rescue- OSHA 1910.146 (K)

24.1 It is the policy of the *DCRSD* to train *employees* to recognize and eliminate hazards, train in methods of self-rescue and non-entry rescues from outside the confined space when necessary, and to rely on *local emergency squads* to respond with trained personnel when required for entry-type rescues.

Subject	Effective	Supersedes	This Sheet	Total
Confined Space Program	November 12 th 2014	New	24	25

EMPLOYEES SHALL NOT ENTER PERMIT REQUIRED CONFINED SPACES TO RESCUE FELLOW EMPLOYEES DUE TO THE INHERENT EXTREME HAZARD OF PERFORMING THESE TYPES OF RESCUES.

IN CASE OF ANY EMERGENCY CALL 911

- 24.2 **Retrieval Systems**-Retrieval systems shall be available and ready when an authorized person enters a *PRCS*. Retrieval systems shall have a full-body harness and a retrieval line attached at the center of the back near shoulder level. The retrieval line shall be firmly fastened outside the space so that rescue can begin as soon as anyone is aware that retrieval is necessary. A mechanical device shall be available to retrieve personnel from vertical confined spaces more than five (5) feet deep.
- 24.3 **Self –Rescue OSHA 1910.146 (h)(4)-(h)(5)**- Because of the speed at which confined space hazards can incapacitate and kill, self-rescue is the preferred plan of the *DCRSD*. The self-rescue plan provides *entrants* with the best chance of escaping a permit space when hazards are present. Whenever authorized *entrants* recognize their own symptoms of exposure to a dangerous atmosphere, or when a prohibited condition is detected, *entrants* are still able to escape from the space unaided and as quickly as possible.
- 24.4 **PRCS Non-Entry Rescue**- As the next best approach (when self-rescue is not possible) non-entry rescue can be started right away and prevents additional personnel from being exposed to unidentified and/or uncontrolled confined space hazards. Usually, equipment and other rescue aids are employed to assist in removing endangered *entrants*.
- **The *DCRSD* requires all *PRCS* entrants to remain tethered at all times during the entry for non-entry rescue procedures. OSHA 1910.146 (k) (3) (i)**
 - **The *DCRSD* will require that the entrant’s travel (work zone) in the confined space be limited to less than one third of the space size to facilitate a proper emergency self-rescue or non-entry rescue.**
 - **The scope of work required to be completed in the confined space shall be planned and carried out in a method that will remove obstructions, clearing the path for a safe work zone and a quick exit, if necessary.**
 - **The self-contained self –rescuer emergency oxygen unit shall be placed in the adjacent area of the entrants at all times. The *attendant* or lookout will be required to maneuver the unit frequently, maintaining a minimal distance from the *entrant*.**

25.0 Outside Contractors - OSHA 1910.146 (c) (8-9)

- 25.1 The *Operations Superintendent* or his *designee* shall provide the *contractor* with this policy and receive, in exchange, a signed statement acknowledging receipt of and compliance with this policy before work can commence.
- 25.2 *Contractors* will be required to provide documentation of a confined space program including, but not limited to, established confined space procedures, employee training, emergency rescue plans, and retrieval equipment.
- 25.3 *Contractors* using confined space procedures shall, at a minimum, comply with this procedure.
- 25.4 *DCSRD* will maintain the right for refusal of the service, or the right to terminate the service based upon any non-compliance of the *DCRSD* Confined Space Program during entry of any *PRCS* service.

Subject	Effective	Supersedes	This Sheet	Total
Confined Space Program	November 12 th 2014	New	25	25

25.5 The *contractor* shall be informed of all actual and potential atmospheric hazards that may be encountered, and any history of the PRCS or NPRCS hazards that DCRSD may have experienced.

25.6 The *contractor and DCRSD* shall have a debriefing meeting upon completion of the entry regarding any hazards that may have been confronted or created during the entry.

25.7 The use of *DCRSD* tools and equipment including, but not limited to, power tools, scaffolds, lighting, personal protective equipment, fall protection, and hand tools is prohibited without the expressed written consent of *DCRSD*.

25.8 When written consent is provided allowing the contractor to use the tools and equipment of the owner, the contractor shall indemnify and hold harmless *DCRSD* from any liability of any kind arising out of the possession, maintenance, use, operation, and/or failure of said machinery, equipment, regardless of whether tools are defective or not. The contractor further provides that all employees using the equipment of *DCRSD* are trained as per current federal, state, local, and *DCRSD* requirements in the safe operation of that equipment. If the property of *DCRSD* becomes damaged while in the possession of the contractor, the contractor shall be liable for damage repair satisfactory to *DCRSD*. The *DCRSD* may choose to allow the use of equipment to be based on a rental price (if agreed upon).



CONFINED SPACE EVALUATION FORM

Delaware County Regional Sewer District
OSHA 29 CFR 1910.146 (C) (1)

FACILITY _____

BUILDING/PROCESS _____

STRUCTURE _____

CONFINED SPACE QUESTIONNAIRE

- | | | Y | N |
|---|--|--------------------------|--------------------------|
| 1 | Is the space large enough or configured to permit bodily entry ? | <input type="checkbox"/> | <input type="checkbox"/> |
| 2 | Are there limited or restricted means of access or egress ? | <input type="checkbox"/> | <input type="checkbox"/> |
| 3 | The space is not designed for continuous occupancy ? | <input type="checkbox"/> | <input type="checkbox"/> |

TO QUALIFY AS CONFINED SPACE ALL 3 MUST BE YES

- | | | Y | N |
|-----|--|--------------------------|--------------------------|
| 4 a | Is there a potential or actual hazardous atmosphere ?
If yes explain, _____ | <input type="checkbox"/> | <input type="checkbox"/> |
| b | Is there a potential for engulfment or entrapment ? | <input type="checkbox"/> | <input type="checkbox"/> |
| c | Is the internal configuration such that an entrant may be trapped or asphyxiated ? | <input type="checkbox"/> | <input type="checkbox"/> |
| d | Does the space contain any other safety or health hazards
(e.g., mechanical, chemical, thermal, electrical, etc.) ?
If yes explain, _____ | <input type="checkbox"/> | <input type="checkbox"/> |

TO QUALIFY AS PERMIT REQUIRED CONFINED SPACE ONLY 1 OF 4 MUST BE YES

BASED ON THE FOLLOWING QUESTIONS, DEFINE THE TYPE OF CONFINED SPACE

Type of space determined

1. _____ Non-regulated space (NO is checked for one or more of questions 1-3)
2. _____ Non-permit confined space (YES is checked for questions 1-3 and No is checked for questions 4a-4d)
3. _____ Permit required confined space (YES is checked for questions 1-3 and any one of questions 4a-4d)

Signage Required OSHA 29 CFR 1910.146 (c) (2)

- | | Y | N |
|---|--------------------------|--------------------------|
| DANGER---PERMIT REQUIRED CONFINED SPACE, DO NOT ENTER | <input type="checkbox"/> | <input type="checkbox"/> |
| DANGER---NON-PERMIT CONFINED SPACE, POTENTIAL HAZARDOUS
ATMOSPHERE | <input type="checkbox"/> | <input type="checkbox"/> |

Delaware County Regional Sewer District		Date _____
Mark Chandler _____	Ken Rosenbaum _____	
Dale Davis _____	Cory Smith _____	
Matt Ice _____	Ricky Thomas _____	
All supervisors must initial and date		Revised 7-1-2014



CONFINED SPACE ENTRY PERMIT

Delaware County Regional Sewer District
OSHA 29 CFR 1910.146 (F)

ADDRESS OF CONFINED SPACE TO BE ENTERED (SEE CHART) _____ Date _____ Time _____

DESCRIPTION OF WORK TO BE PERFORMED: _____

PERMIT EXPIRES: Date _____ Time _____

PERMIT TERMINATED FOR REASONS OF: _____

HAZARD ASSESSMENT

- P - Potential or A - Actual
- Oxygen deficiency _____
- Flammable gases _____
- Toxic gases _____
- Mechanical _____
- Electrical shock _____
- Engulfment _____
- Configuration _____
- Septic water _____
- Sludge/Grit _____
- Ladder Safety _____
- Fall Hazard _____
- Other _____

EQUIPMENT REQUIRED FOR ENTRY AND WORK

- _____ Lighting
- _____ Proper PPE
- _____ Lifeline-fall protection
- _____ Emergency retrieval equip
- _____ Fire extinguishers
- _____ LO/TO Kit
- _____ GFCI ext cords
- _____ Radio
- _____ SC-SR unit

PRE-ENTRY PERSONNEL

Entry Supervisor _____

Authorized Entrants _____

Authorized Attendants _____

Authorized Lookout _____

PRE-ENTRY PREPARATION

- _____ Entry Team assigned
- _____ All Safety Equipment on-site
- _____ Secure area
- _____ Hazard Assessment
- _____ Pre-entry atmosphere test
- _____ Lockout-Tagout devices applied
- _____ Fall/Retrieval Equipment installed
- _____ Ventilation control
- _____ Emergency Plans Established
- _____ Employees informed of hazards
- _____ Employees informed of procedures
- _____ Other _____

**EMERGENCY
911**

RECORD ATMOSPHERIC TESTING EVERY 15 MINUTES DURING ENTRY

ALARM POINTS	Pre-Entry	TIME	TIME	TIME	TIME	TIME	TIME	TIME	TIME	TIME	TIME	TIME
O2-19.5%												
LEL-10%												
CO-25 PPM												
H ₂ S-10 PPM												

WARNING-IF METER ALARMS-EXIT SPACE IMMEDIATELY

Monitored by _____ Instrument Used _____ Days Left _____

Entry Supervisor

AUTHORIZATION: I CERTIFY THAT ALL REQUIRED PRECAUTIONS HAVE BEEN TAKEN AND EQUIPMENT HAS BEEN PROVIDED FOR SAFE ENTRY AND WORK. THIS STATEMENT AND ALL PERTINENT DATA HAS BEEN MADE AVAILABLE TO ALL ENTRANTS.

DATE _____ TIME _____

Print Name _____ Signature _____



NON-PERMIT CONFINED SPACE RECLASSIFICATION FORM

Delaware County Regional Sewer District
OSHA 29 CFR 1910.146 (C) (7)

ADDRESS OF CONFINED SPACE
TO BE ENTERED (SEE CHART) _____ Date _____ Time _____

DESCRIPTION OF WORK TO BE PERFORMED: _____

TIME OF ENTRY COMPLETED: _____

HAZARDS ELIMINATED	LOCKOUT -TAGOUT DEVICES APPLIED	AUTHORIZED ENTRANTS
Oxygen deficiency _____	_____	_____
Flammable gases _____	_____	_____
Toxic gases _____	_____	_____
Mechanical _____	_____	_____
Electrical shock _____	_____	_____
Engulfment _____	_____	_____
Configuration _____	_____	_____
Septic water _____	_____	_____
Sludge/Grit _____	_____	AUTHORIZED LOOKOUT
Ladder Safety _____	_____	_____
Fall Hazard _____	_____	_____
Other _____	_____	_____

**IF THE HAZARD RETURNS, THE SPACE MUST RECLASSIFIED TO A PRCS
PLEASE EXIT THE SPACE IMMEDIATELY**

RECORD ATMOSHPERIC TESTING EVERY 60 MINUTES DURING ENTRY

ALARM POINTS	Pre-Entry	TIME	TIME	TIME	TIME	TIME	TIME	TIME	TIME	TIME	TIME	TIME
O2-19.5%												
LEL-10%												
CO-25 PPM												
H ₂ S-10 PPM												

Monitored by _____ Instrument Used _____ Days Left _____

COMMENTS

Authorized Entrant

AUTHORIZATION: I CERTIFY THAT THE CONFINED SPACE LISTED ABOVE IN THIS DOCUMENT HAS BEEN RECLASSIFIED AS A NON-PERMIT CONFINED SPACE. ALL HAZARDS HAVE BEEN ELIMINATED.

DATE _____ TIME _____

Print Name _____ Signature _____



CONFINED SPACE ENTRY HOT WORK PERMIT

Delaware County Regional Sewer District
OSHA 29 CFR 1910.252

ADDRESS OF CONFINED SPACE
TO BE ENTERED (SEE CHART) _____ Date _____ Time _____

DESCRIPTION OF WORK TO BE PERFORMED: _____

PERMIT EXPIRES: Date _____ Time _____

PERMIT TERMINATED FOR REASONS OF: _____

HAZARD ASSESSMENT

P - Potential or A - Actual

- Oxygen deficiency _____
- Flammable gases _____
- Toxic gases _____
- Mechanical _____
- Electrical shock _____
- Engulfment _____
- Configuration _____
- Septic water _____
- Sludge/Grit _____
- Ladder Safety _____
- Fall Hazard _____

EQUIPMENT REQUIRED FOR ENTRY AND WORK

- _____ Lighting
- _____ Proper PPE
- _____ Lifeline-fall protection
- _____ Emergency retrieval equip
- _____ Fire extinguishers
- _____ LO/TO Kit
- _____ GFCI ext cords
- _____ Radio
- _____ SC-SR unit

Hot Work Equipment & Tools

- _____ Approved electrical equipment
- _____ Non-sparking tools
- _____ Combustible materials/supplies 35 ft from space
- _____ ONLY Torches-hoses-electrical leads in PRCS
- _____ Remove all equipment from space if work is suspended for more than 30 minutes
- _____ Attendant require to wear proper eye protection

PRE-ENTRY PREPARATION (Check all that apply)

- _____ Entry Team assigned
- _____ All Safety Equipment on-site
- _____ Secure area
- _____ Hazard Assesment
- _____ Pre-entry atmosphere test
- _____ Lockout-Tagout devices applied
- _____ Fall/Retrievel Equipment installed
- _____ **Mandatory Ventilation with fresh air**
- _____ Emergency Plans Established
- _____ Employees informed of hazards
- _____ Employees informed of procedures
- _____ Other _____

PRE-ENTRY PERSONNEL

Entry Supervisor _____

Authorized Entrants (Name) _____

Authorized Attendants (Name) _____

**EMERGENCY
911**

RECORD ATMOSHPERIC TESTING EVERY 15 MINUTES DURING ENTRY

ALARM POINTS	Pre-Entry	TIME	TIME	TIME	TIME	TIME	TIME	TIME	TIME	TIME	TIME	TIME
O2-19.5%												
LEL-10%												
CO-25 PPM												
H ₂ S-10 PPM												

WARNING-IF METER ALARMS-EXIT SPACE IMMEDIATELY

Monitored by _____ Instrument Used _____ Days Left _____

Entry Supervisor

AUTHORIZATION: I CERTIFY THAT ALL REQUIRED PRECAUTIONS HAVE BEEN TAKEN AND EQUIPMENT HAS BEEN PROVIDED FOR SAFE ENTRY AND WORK. THIS STATEMENT AND ALL PERTINENT DATA HAS BEEN MADE AVAILABLE TO ALL ENTRANTS.

DATE _____ TIME _____

Print Name _____ Signature _____



CONFINED SPACE EQUIPMENT RENTAL AGGEMENT

Delaware County Regional Sewer District
 Confined Space Program

RENTAL FEES

EQUIPMENT DESCRIPTION	COST/DAY	QTY	TOTAL
Tri-pod	\$150.00		
Davit Arm	\$175.00		
Barrel Mount Anchor Base	\$250.00		
Manhole Collar Anchor Base	\$250.00		
Vehicle Hitch Anchor Base	\$250.00		
Parapet Wall Anchor Base	\$250.00		
		TOTAL	

I, _____, a representative of
 _____, hereby agree to

the terms as written in the Delaware County Regional Sewer District's

Confined Space Program.

PLEASE MAKE CHECKS PAYABLE TO:
 THE DELAWARE COUNTY REGIONAL SEWER DISTRICT:
 50 Channing Street Delaware, Ohio 43015

Contractor	
Representative	
PRINT NAME _____	SIGNATURE _____
County	
Representative	
PRINT NAME _____	SIGNATURE _____
	Revised 9-12-2014

Treatment Plant Addresses

ACWRF	7767 Walker Woods BLVD Lewis Center
Bent tree	350 Bent tree Dr Sunbury
CMF	10333B Olentangy River RD Powell
Hoover Woods	10158 Hoover Woods Rd Galena
Lower Scioto	6579 Moore Rd Delaware
North Star	5863 WILSON RD Sunbury
OECC	10333 Olentangy River RD Powell
Scioto Hills	5145 Bayhill DR Powell
Scioto Reserve	7741 Riverside Dr Powell
Tartan Fields	10811 Manley Rd Dublin

Pump Stations

Alum Creek	7850 Worthington Rd Westerville
Cheshire	2359 Africa Rd Galena
Clear Creek	4789 Scenic Creek Dr. Powell
Concord Rd	10416 Concord Rd Dublin
Deer Run	178 Valley Run DR Powell
East Alum Creek	201 Africa RD Galena
Golf Village	3239 Seldom Seen Rd
Golf Village North	6873 Sawmill Parkway. Powell
Lakes Of Powell	557 South Liberty St Powell
Leather Lip's	Between 10848 and 10828 Buckingham PL Powell
Maxtown	7819 Maxtown RD Westerville
North star	2487 Wilson Rd. Sunbury
Peachblow	5001 South Old State Rd Lewis Center
Phase 20	6841 Harriott Rd. Dublin Oh.
Quail Meadows	8631 Liberty Rd North Powell
Scioto Bluffs	8939 Riverside Dr Powell
Scioto Reserve	By 8008 Tree Lake Blvd Turn Right on Golf cart path
Seldom Seen	4820 Seldom Seen Rd Powell
Sherbourne Mews	1479 Sherbourne Lane Powell
Summerwood	3197 Africa Rd Galena
The Oaks	7861 Harriott Rd. Dublin Oh
Tilling Hast	Across The Street from 7844 TILLINGHAST DR Dublin
Trotters Gait	9221 RIVERSIDE DR Powell
Vinmar	7869 Vinmar Way Galena

Metering Pits

Drugmart	8951 S Old State Rd, Lewis Center
Lakes	1268 WOODRIDGE DR Lewis Center
Polaris	8203 Worthington Rd Westerville
Polaris Self Storage	9650 S OLD STATE RD
Rajan	8550 Orion Pl, Columbus
Tartan Fields	8715 Tartan Fields Dr Dublin
Union County	8984 Tartan Fields Dr Dublin