CSE Open Channel Sewer - Moderate Sample Hazard Atmosphere Risk Assessment

# RISK ASSESSMENT FOR: MODERATE HAZARD ATMOSTPHERE CSE INTO OPEN CHANNEL SEWER SYSTEMS

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| **WORK LOCATION:** |  | **DESCRIPTION OF WORK:** | **Entering into open channel sewers to perform inspections, cleaning, modifications of the wastewater collection system, and, installation, routine maintenance, removal and**  **calibration of temporary flow monitoring instrumentation.** | | |
| **COMPLETED BY**: |  | **ASSESSMENT**  **DATE:** |  | **RANKING:** | **Medium** |

1. **WORK ACTIVITIES: (Include PPE Requirements for Quick Reference)**

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| --- |
| **List Task Activity: Entering into open channel sewers to perform inspections, cleaning, modifications of the wastewater collection system, and, installation, routine maintenance, removal and calibration of temporary flow monitoring instrumentation.** |
| **PPE Required:** Hard hat (entrant must have chin strap), hearing protection (class B as a minimum), high-visibility clothing, coveralls/work clothes, leather/rubber/nitrile gloves (task dependent), full-body harness with dorsal D-ring, full-faced air-purifying respirator with combination of AG/OV/P100 cartridge, CSA approved steel-toed rubber boots (must have good tread and ankle protection)  **Equipment Required:** battery-powered temporary LED lighting, battery-powered head lamp, ground fault circuit interrupter (GFCI), ventilation fan (must be capable of 1500 CFM – 1800 CFM, 12” duct), first aid kit, tripod and winch with Type 3 SRL (greater than 3m/10ft in length), sharps container and tongs on-site, delineators/barricades/cones (for traffic management), decontamination supplies (hand sanitizer, BZK wipes to field clean hands), personal 4-gas detectors (O2, H2S, CO, LEL)  *\*Note: all powered equipment/PPE must be intrinsically safe\** |

1. **HAZARDS & RISK LEVEL RATINGS: SCORE = C + P + E = Rate (**3-4 are L**OW) (**5-6-7 are **MEDIUM)** (8-9 are **HIGH)** priority

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| --- | --- | --- | --- | --- | --- | --- |
| **HAZARD #** | **HAZARD IDENTIFICATION** | **CONSEQUENCES** | **PROBABILITY** | **EXPOSURE** | **RISK** | **RATING**  **L/M/H** |
| **1** | Carbon monoxide (CO) and other combustion by products (ex. exhaust from vehicles near the entrance) | 2 | 2 | 3 | 7 | Medium |
| **2** | Hydrogen Sulfide (H2S) from wastewater in channel | 3 | 2 | 3 | 8 | High |
| **3** | Oxygen deficiency (O2) due to available oxygen being used  by rust, corrosion etc. | 3 | 2 | 3 | 7 | Medium |
| **4** | Particulates (bio-aerosols from wastewater in channel) | 2 | 2 | 3 | 7 | Medium |
| **5** | Combustible gases (ex. methane, misc. fuel vapours and  solvents) | 3 | 2 | 3 | 8 | High |

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| --- | --- | --- | --- | --- | --- | --- |
| **6** | Contact with toxic and/or corrosive material (ex. wastewater  in channel) | 2 | 2 | 3 | 7 | Medium |
| **7** | Biological hazards (wastewater in channel – wet or dry  surfaces) | 2 | 3 | 3 | 8 | High |
| **8** | Sharps/puncture wounds (possible discarded sharps/needles  in water) | 2 | 2 | 3 | 7 | Medium |
| **9** | Noise/vibration | 2 | 2 | 3 | 7 | Medium |
| **10** | Restricted access/egress (vertical entry through manhole) | 2 | 3 | 3 | 8 | High |
| **11** | Congested/restricted work area (small space) | 2 | 2 | 3 | 7 | Medium |
| **12** | Ergonomic hazards (limited workspace, awkward body  positioning) | 2 | 2 | 3 | 7 | Medium |
| **13** | Electrical/electrocution/explosion hazards (generator or  invertor electrically-powered equipment) | 3 | 2 | 3 | 8 | High |
| **14** | Structural hazards (deteriorated condition of concrete,  ladder etc.) | 2 | 1 | 3 | 6 | Medium |
| **15** | Engulfment or immersion hazards (wastewater flow in  channel) | 3 | 1 | 3 | 7 | Medium |
| **16** | Entanglement | 2 | 2 | 3 | 7 | Medium |
| **17** | Falling hazard (around access through manhole and while  using a ladder) | 3 | 2 | 3 | 8 | High |
| **18** | Slip and trip hazards (trip on equipment, slip on ladder rungs,  benching or invert) | 2 | 2 | 3 | 7 | Medium |
| **19** | Limited visibility (low light due to limited natural lighting) | 2 | 3 | 3 | 8 | High |
| **20** | Vehicular/pedestrian traffic (near entrance to space) | 3 | 2 | 3 | 8 | High |
| **21** | Insect/animal bites | 2 | 2 | 3 | 7 | Medium |
| **22** | Overhead/falling objects | 3 | 2 | 3 | 8 | High |
| **23** | Restricted means of communication (noise from traffic and  equipment) | 2 | 2 | 3 | 7 | Medium |
| **RISK TOTAL:** | | **2** | **2** | **3** | **7** | **Medium** |

**Add up the individual columns: (Consequence, Probability, Exposure, Risk and divide by number of Hazards)**

# MATRIX FOR RANKING THE HAZARDS:

|  |  |  |  |
| --- | --- | --- | --- |
| **SCORE** | **1** | **2** | **3** |
| **CONSEQUENCES:** | first aid / minor damage | lost time injury/moderate damage | fatality / major damage |
| **PROBABILITY:** | unlikely | possible | likely |
| **EXPOSURE:** | rarely (less than 1/month) | often (3 times/week) | everyday |

1. **CONTROL MEASURES FOR EACH HAZARD IDENTIFIED IN SECTION 3**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **HAZARD #** | **LIST ALL EXISTING CONTROL MEASURES**  **(Eliminate, Substitute, Engineering, Administrative, PPE)** | **RECOMMENDATIONS** | **Date required** | **Person Responsible** | **Initial when complete** |
| **1** | Ensure proper ventilation, atmospheric monitoring (pre-entry and during  entry), keep vehicle exhaust away from fan air intake |  |  |  |  |
| **2** | Ensure proper ventilation, atmospheric monitoring (pre-entry and during  entry), work when flow is low |  |  |  |  |
| **3** | Ensure proper ventilation, atmospheric monitoring (pre-entry and during  entry), work when flow is low |  |  |  |  |
| **4** | Ensure proper ventilation, wear your respiratory protection, work when flow  is low |  |  |  |  |
| **5** | Ensure proper ventilation, wear your respiratory protection, atmospheric  monitoring (pre-entry and during entry), visually monitoring sewage |  |  |  |  |
| **6** | Wear proper PPE (eye, face, respiratory protection; wear protective clothing), work when flow is low, visual monitoring, decontaminate when job  complete |  |  |  |  |
| **7** | Wear proper PPE (eye, face protection; protective clothing), work when flow is low, decontaminate when job complete |  |  |  |  |
| **8** | Wear required PPE and clothing, exercise situational awareness, ensure  sharps container and tongs are on-site, internal sharps awareness training |  |  |  |  |
| **9** | Hearing protection, positioning of fan, ensure good communication (pre-job meeting, verbal and visual cues) |  |  |  |  |
| **10** | Use tripod and SRL, rescue plan |  |  |  |  |
| **11** | Good housekeeping in space and near manhole, situational awareness,  rescue plan in place |  |  |  |  |
| **12** | Proper body positioning, take micro breaks, vary task/role when possible, stretch, we aware of surroundings |  |  |  |  |
| **13** | Use GFCI, intrinsically safe equipment |  |  |  |  |
| **14** | Visual inspection of structure |  |  |  |  |
| **15** | Self-retracting lifeline, work when flow is low, visually monitor flow when in  space, follow-alternate measures procedure |  |  |  |  |
| **16** | Good housekeeping, line management, awareness of surroundings |  |  |  |  |
| **17** | Wear harness and use fall protection equipment, maintain 3-point contact on  ladder, situational awareness, fall protection training |  |  |  |  |
| **18** | Proper footwear, situational awareness, maintain 3-points of contact |  |  |  |  |
| **19** | Portable lighting and headlamp/flashlight (must be intrinsically safe) |  |  |  |  |
| **20** | Traffic control plan, high visibility attire, situational awareness |  |  |  |  |
| **21** | Wear PPE, situational awareness, visual inspection of space |  |  |  |  |
| **22** | Good housekeeping, raise and lower tools securely, wear hard hats |  |  |  |  |

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| --- | --- | --- | --- | --- | --- |
| **23** | Plan communication methods prior to entry (verbal and visual cues) |  |  |  |  |

1. **HIERARCHY OF CONTROL MEASURES: (Must be followed in the order below)**

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| --- | --- | --- |
| **ORDER** | **CONTROL** | **DESCRIPTION** |
| **1** | **ELIMINATION:** | Can the hazard be removed at the source? Can the task be eliminated entirely? Example: eliminating the need to have a worker enter an excavation by hydro-excavating to expose underground infrastructure. |
| **2** | **SUBSTITUTION:** | Can a hazard, hazardous process or hazardous material be substituted with one with no hazards? Example: using salt water brine instead of a chemical for deicing the roads. |
| **3** | **ENGINEERING:** | Engineering controls include isolation, ventilation and equipment modification. These controls focus on the source of the hazard. Example: a guard placed around a saw blade, or a shoring system placed in an excavation. |
| **4** | **ADMINISTRATIVE:** | Remove or reduce the exposures by reducing the duration, frequency and severity of exposure to hazards. Example: changes to work procedures & practices, scheduling, job rotation, breaks during heat/cold exposure. |
| **5** | **PPE:** | Personal Protective Equipment does not control the hazard but reduces the effect of exposure to the hazard has on the worker. PPE must always be the last line of defense Example: earplugs, latex gloves, CSA boots, CSA Hard Hats |

# REVIEWED BY:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **DATE** | **REVISION DATE** | **PRINT NAME** | **POSITION** | **SIGNATURE** |
|  |  |  |  |  |
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**THE HAZARD IDENTIFICATION AND ASSESSMENT PROCESS**

* 1. Identify the task to be assessed, determine if the task is **H**igh, **M**edium or **L**ow risk
  2. Include workers who have experience in performing the task, ensure the process is lead by someone who has training and experience in conducting hazard assessments. These individuals must have some type of formal training.
  3. Identify hazards associated with the tasks. Consider PHYSICAL, CHEMICAL, BIOLOGICAL, AND PSYCHOLOGICAL
  4. Rate the hazards by degree of risk using the following matrix:

|  |  |  |  |
| --- | --- | --- | --- |
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| **PROBABILITY:** | unlikely | possible | likely |
| **EXPOSURE:** | rarely (less than 1/month) | often ( 3 times/week) | everyday |

**TOTAL** the three columns: **(T)**

* + - 3-4 are **low** priority hazards
    - 5-7 are **medium** priority hazards
    - 8-9 are **high** priority hazards

The **high** priority hazards are addressed first, followed by the **medium** priority hazards. **Low** priority hazards may not require attention at this time, they may simply require monitoring. The Hierarchy of Control Measures must be followed when eliminating or mitigating hazards in the following order:

|  |  |  |
| --- | --- | --- |
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Hazard Assessments **must be reviewed** in accordance with Hazard Assessment Program Guide.