

# SAFE WORK PROCEDURE

## GENERAL CONFINED ENTRY

**NOTE: This procedure is intended as a guideline only, and does not cover every possible instance. If you require additional information, or clarification, Please contact the Water & Waste Safety Branch, 109-1199 Pacific Avenue, 986-4441**

## APPLICATION

This procedure is to be followed when performing work activities in a Confined Space.

### Confined Space

A confined space is defined as any work area which:

- a) Is not intended for continuous worker occupancy.
- b) Has by design, structure, location, limited or restricted entry and exit.
- c) May contain or produce dangerous accumulations of hazardous gases, vapors, mists, dusts, fumes, fogs, lack of enrichment of oxygen and biological agents.

## PROTECTIVE MEASURES/REQUIRED STEPS. ETC

### Training

Supervisors are responsible to ensure training of all personnel who are required to work inside a Confined Space. Training includes:

1. Emergency and evacuation Procedures.
2. Confined Entry Procedures.
3. Personally Fitted Airline Respirator and Escape Air Bottle.
4. First Aid.
5. Instrument Training.

### Potential Hazards or Risks

The following is a list of the potential hazards, which may be encountered in a Confined Space.

1. Falling or slipping.
2. Oxygen deficiency.
3. Explosive gases.
4. Toxic gases.
5. Other general safety hazards including electrical, mechanical, temperature and humidity.

All of these hazards can be minimized if the safe work practices outlined in this procedure are observed and followed by all employees.

### First aid

Every employee will be trained in First Aid (CPR) and will renew their training every three (3) years on a regular basis.

### CONFINED ENTRY PROCEDURES

All new employees will take a Confined Entry Procedure course offered by the City of Winnipeg. As well, refresher training may be offered as new employees are hired and for the purposes of updating this procedure. The following confined entry procedure shall apply:

1. Properly lock and tag energy source before entering.
2. A multiple gas tester will be used to ensure that the confined space is free of toxic gases; that the oxygen level is in an acceptable range and is safe for entry.
3. Recommended two people will remain within the immediate area of the confined space to act as Safety/Standby Personal (among other duties) in case of an emergency.
4. A confined Entry Permit" needs to be completed and posted at the entrance to the Confined Space.
5. Continuous monitoring is required while work is performed, ventilation if required.

*If this document is a hard copy it is uncontrolled and may not be the current version.  
Check the Standard Operating Procedure located in the N:\Synergen Attachments\Wastewater\Facility Name Acronym\SOP folder*

<b>Standard Operating Procedure (SOP) &amp; Job Hazard Analysis (JHA)</b>		<b>Job Name:</b> Sludge Truck Bay-Calibrate H <sub>2</sub> S Sensor	<b>Task Number:</b> 01 of 01
<b>Task:</b> Calibrate H <sub>2</sub> S Sensor		<b>Creation Date:</b> April 12, 2010	
		<b>Revision Date:</b> May 18, 2012	
<b>Hazards Present:</b> <ul style="list-style-type: none"> <li>• Pressurized Test Gas</li> <li>• H<sub>2</sub>S</li> <li>• O Test Gas</li> </ul>	<b>Applies To:</b> (Division/Branch/Area/Crew) Wastewater/SEWPCC/Secondary/SEEI	<b>Personnel Training Requirements:</b> <ul style="list-style-type: none"> <li>• WHMIS</li> <li>• Working Alone Plan</li> </ul>	
<b>Tools/Equipment Required:</b> <ul style="list-style-type: none"> <li>• Electrician Tool Kit</li> </ul>	<b>Materials/Supplies Required:</b> <ul style="list-style-type: none"> <li>• Zero Air Calibration Gas</li> <li>• H<sub>2</sub>S Calibration Gas</li> <li>• Carry Tote Bag</li> <li>• Pylon</li> </ul>	<b>Personal Protective Equipment:</b> Staff shall conduct a tailgate meeting prior to following the procedure. <ul style="list-style-type: none"> <li>• Safety Glasses</li> <li>• Nitrile Gloves</li> <li>• Working Alone Plan</li> <li>• 2-Way Communication Device</li> </ul>	
<b>Sequence of Steps/ Procedure</b>	<b>Potential Accidents or Hazards</b>	<b>Recommended Safe Job Procedure</b>	
1. Check bay for sludge hauler truck loading sludge. Wait for truck to leave prior to testing. Put pylon in front of door.	a) Sludge hauler truck backing into bay can back over employees working in bay. False alarms from test may confuse sludge haulers.	a) This test is done to verify the accuracy and operation of the H <sub>2</sub> S sensor which shall be done when there are no tractor trailer units loading. This test will confuse the sludge hauler as the alarms will go off. Wait till the bay is empty before proceeding with the test.	

**SOP-JHA-WW-SEWPCC-Secondary-Sludge Truck Bay-Calibrate H<sub>2</sub>S Sensor-01 of 01-Calibrate H<sub>2</sub>S Sensor**

**Water and Waste Department**

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2. Purge sensor located in truck sludge loading bay.

- A. Connect Zero Air calibration gas, open valve to purge sensor. In the secondary lab room, watch the analyzer at the bottom of scale looking for changes in the value close to Zero. Record results above or below zero. Adjust zero scale as required. Allow purge Zero Air gas to stabilize approximately 5 minutes before adjusting zero on scale.



A.

- a) Dropping calibration gas bottle. The bottle is under pressure and can puncture under the right conditions.
- Inhalation of gas can cause drowsiness, headaches, and asphyxiation.
  - Eye exposure contacts.



A. Wear safety glasses at all times while handling gas bottles. Read the MSDS for WHMIS precautions.

- a) The calibration gas bottle shall be handled using the carrying case. While connecting calibration gas bottles, use both hands and place bottle on floor prior to connecting hose, then turn on the gas.
- For inhalations remove worker to fresh air, if breathing is difficult give oxygen and follow emergency plan.
  - Immediately flush eyes for 15 minutes with potable water. Seek medical attention.





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<p>3. Calibrate H<sub>2</sub>S sensor using test gas connected to sensor.</p> <p>A. Remove Zero Air calibration gas and connect H<sub>2</sub>S calibration gas to sensor. Return to secondary lab room and wait for gas to stabilize 5 minutes. Check scale readings and record results. The test gas is 40ppm as this should be seen on scale as such. Adjust span of scale to equate 40ppm and wait for meter to stabilize. At this time, the monitor shall show alarm indicator lights on yellow and red. Check the truck sludge loading bay visually to see the strobe light is on and verify the exhaust fan is on. This may take more than 5 minutes. Record before and after results.</p> <p>B. Re-connect Zero Air calibration gas and check zero on scale. A fine adjustment may be required. The alarms will shut off using Zero Air calibration gas.</p>	<p>A.</p> <p>a) Dropping test gas puncturing bottle. High pressure gas can contact skin causing infections and rash.</p> <ul style="list-style-type: none"> <li>Alarms going off disrupting other work in building causing loss of production.</li> </ul>  <p>B.</p> <p>a) Dropping test gas puncturing bottle. High pressure gas can contact skin causing infections.</p> <p>b) Inhalation can cause nausea and light headiness.</p>	<p>A.</p> <p>a) Handle test gas with both hands and wear safety glasses while connecting and opening gas valve.</p> <ul style="list-style-type: none"> <li>Warn other workers of the test and alarms will be set off. Report test to begin with senior operator as the alarm will log on the DCS system.</li> <li>A check in the secondary electrical room can verify the operation of the grit bay exhaust fan by looking at the individual breaker and indicators. They will be on.</li> </ul>  <p>B.</p> <p>a) Handle bottle wearing safety glasses. Place bottle on floor, connecting line first, then opening valve. In the event of eye contact, flush eyes for 15 minutes and then seek medical attention.</p> <p>b) For inhalation exposure remove person to fresh air and seek medical attention.</p>
<p>4. Complete test closing panel cover.</p> <p>A. Record all results on calibration sheet.</p>		<p>A. Report to Level 4 Operator that the sludge truck bay is now ready to continue loading of sludge and is operational.</p>

Developed By:	1. Brent	2.	3.
Mgmt Co-Chair Approval:	Original Signed By:	Worker Co-Chair Approval:	Original Signed By:

The information in this procedure does not take precedence over applicable government regulations, with which all employees should be familiar.

***SOP-JHA-WW-SEWPCC-Secondary-Sludge Truck Bay-Calibrate H<sub>2</sub>S Sensor-01 of 01-Calibrate H<sub>2</sub>S Sensor***

# WWTP LOTO Appendix 2 Procedure for Specific Equipment Form

Use a copy of this form to identify all isolation/lockout points for existing and new equipment. Use this information to create LOTO procedures. Post this lockout procedure or have it readily available for the authorized individuals to review and use.

<b>Date:</b>	<b>Person Completing Form (print):</b>			<b>WO #</b>
<b>Equipment Name:</b> Primary Clarifier 1		<b>Tag ID:</b> None		
<b>Drawing / P&amp;ID Number:</b>				
<b>Equipment Location:</b> Primary Tank Area				
Is the equipment remotely or locally controlled? (Circle)			<b>Remote</b>	<b>Local</b>
If remote, then be sure to identify all isolation points at MCC or similar systems and the following information:				
<b>Who is to be informed?</b>	<b>Who turns off the equipment?</b>	<b>Is person required also to lock out equipment?</b>	<b>Control in place to prevent startup</b>	
Plant Supervisor		No		
Level 4 Operator		No		
Area Operator	Area Operator Level 2A or higher	Yes	Yes	No
<b>Describe how to turn off equipment:</b> Refer to Section 8 Procedure in SOP.				
<b>Use the following codes to identify the energy source:</b> NP – Non Potable Water; PW – Potable Water; EL – Electrical, HW – Hot Water; PN – Pneumatic; HD – Hydraulic; HC – Hazardous Chemical; BH – Bio-Hazardous;				
Energy Source	Isolation Point (TAG)	Location of Control Point	Crew	Initials
EL	P101-SCC	MCC-1P Primary Electrical Room	SEOP	
EL	P301-BDM	Disconnect Breaker West End of Primary Clarifier 1	SEOP	
BH	S201-HV4	Primary Gallery 4 Scum Overhead Chain Valve	SEOP	
PN	P103-FV1	Primary Gallery 4 sludge withdrawal valve air supply	SEOP	
BH	P103-HV3	Primary Gallery 4 sludge withdrawal valve	SEOP	
BH	P103-HV4	Primary Gallery 4 clarifier 1 drain valve	SEOP	
BH	P104-HV5	Primary Gallery 4 sludge withdrawal valve	SEOP	
BH	P104-HV6	Primary Gallery 4 sludge withdrawal valve	SEOP	
BH	P506-HV	Tank Area North East Side Primary Influent Hand Valve	SEOP	
BH	P507-HV	Tank Area North East Side Primary Influent Hand Valve	SEOP	
<b>Describe how to remove or prevent residual energy from occurring:</b> Before closing valves, ensure that there is no sludge trapped between 2 closed valves. The trapped sludge will create H2S gas, pressurizing the piping and could result in a pipe failure. Flush all lines and ensure one end is open to drain or to the tank.				
<b>Describe test to confirm equipment will not start:</b> Bridge may need to be run to move or test operation prior to return to service. Bridge needs to be tested and run locally.				
<b>Signature of Authorized Employee:</b> _____				

## HAZARD ANALYSIS TOOL (Assigning/Measuring Risk)

$$\text{Risk} = A \times B \times C$$

<b>Frequency of Exposure A</b>	How often is hazard encountered?	<b>Probability of Occurrence B</b>	Based upon A, how likely is the hazard to cause harm?	<b>Severity of Consequence C</b>	How severe could the consequences be?
Continuous <b>10</b>	Daily/constantly	Most likely <b>1.0</b>	Certain to occur	Catastrophic <b>20</b>	Multiple deaths
Frequently <b>6</b>	Few times per week	Possible <b>0.6</b>	Can be expected	Fatal <b>10</b>	Death
Occasionally <b>3</b>	Few times per month	Conceivable <b>0.3</b>	Quite possible	Serious <b>5</b>	Hospital/doctor required
Infrequently <b>2</b>	Few times per year	Remote <b>0.1</b>	Unlikely	Minor <b>2</b>	First Aid
Rarely <b>1</b>	less than once per year	Inconceivable <b>0.05</b>	Practically impossible	Negligible <b>1</b>	Minor injury

Example: Determine the risk to your employees if there was an earthquake in Winnipeg.

A (Frequency of Exposure) = 1

B (Probability of Occurrence) = 0.05

C (Severity of Consequence) = 20

Risk =  $A \times B \times C = 1 \times 0.05 \times 20 = 1$  Based upon this Hazard Analysis Tool, there is a low risk posed to employees by an earthquake in Winnipeg.

**Priority: >10 = High Risk**  
Immediate Action Required

**>3 - 10 = Medium Risk**  
Action Required within 7 Working Days

**0 - 3 = Low Risk**  
Action Required within 21 Working Days

**Water and Waste (Risk Analysis)**

## **SAFE WORK PROCEDURE**

### **General Confined Entry Continued**

#### **EMERGENCY AND EVACUATION PROCEDURES**

An appropriate number of safety/standby employees (a minimum of two) trained in First Aid (CPR) and rescue procedures must be in attendance and continuously monitor the employee(s) in the confined space. At all times, the safety/standby employee must be prepared and be appropriately equipped to carry out a rescue. In the event of an emergency or rescue the following shall apply:

1. When the two way radios are used, request for medical assistance in case of an accident can be made immediately. The Ambulance or Fire Department will be called directly using the closest phone at the Confined Space phone (911).
2. If the accident is not life threatening, first aid would be administered at the location and the injured worker would not be moved until Fire Dept or Ambulance has arrived.

#### **EQUIPMENT**

The following is the minimum list of equipment, which must be available when going in a confined entry:

1. Atmospheric Tester and Monitor.
2. Portable Ventilation Equipment
3. Personally Fitted Airline and Escape Air Bottle
4. Personal Protective Equipment.
5. Portable Ground Fault Detector.
6. Explosion Proof Light.(s)
7. Two-Way radios.
8. SCBA (Self Contained Breathing Apparatus) for Safety/Standby Personnel.

### **WORKER RESPONSIBILITY**

Each employee is responsible for his/her safety and must assume certain duties and responsibilities to insure on the job safety. These include as a minimum:

1. Knowing his/her job and applying safe work practices as guided by published department work rules or procedures.
2. Recognizing the hazards of the job and taking precautions to ensure his/her safety and the safety of those around.
3. Informing his/her supervisor of hazards or unsafe acts and making recommendations as to how to eliminate or minimize those hazards.
4. Actively participating and cooperating in the overall safety program.

### **SUPERVISOR RESPONSIBILITY**

Supervisors recognize their responsibility to establish a policy in the interest of the protection of health and the prevention of conditions leading to injury.

Management duties include but are not limited to the following:

1. Managers organize and participate as advisor to the safety committee composed of representatives of supervisors and employees.
2. Encourage and coordinate safety training activities for supervisory personnel and employees.
3. Coordinate and review accident investigations.

**ENTRY PERMIT MUST BE COMPLETED AND POSTED AT THE CONFINED AREA.**

**ALWAYS ASSUME CONFINED SPACES TO BE IMMEDIATELY DANGEROUS TO LIFE AND HEALTH (IDLH)**

# **SAFE WORK PROCEDURE**