Alternate Measures of Control (AMC)

for Primary Clarifiers (3) Confined Space Entries

Medium Hazard Atmosphere

City of Penticton AWWTP

January 11, 2017

**Alternate Measures Submission Elements:**

1. The three confined spaces are rectangular concrete tanks. The primary clarifiers are located just east of the plant entrance. The tanks are 5.7 m wide x 4.5m deep x 53 m long for a total volume of 1,359 m3 each. There are two adjacent concrete channels, the inlet (upstream) channel and the outlet (Downstream) channel. The inlet (Upstream) channel is gravity feed from the headworks building and is typical of screened municipal raw wastewater (Typical water level (TWL) 343.5m). The outlet channel (downstream) is gravity fed from downstream of primary clarifiers (TWL 343.0 m). Bottom of the tank elevation is 339.4 m. There is one 200 mm suction line that penetrates the concrete and enters into the sump of the tank.
2. The space is isolated by:
   1. The inlet gravity feed channel has 2 Armtec 200mm x 1990mm aluminum wall mounted hand pull gates for each primary clarifier (3). They were installed in 2012, and are exercised at a minimum annually (no provision for double block and bleed or blanking). Drawing attached. The total head pressure of water applied against each hand pull gate from the upstream channel is 1600 mm or 2.25 psi of head pressure
   2. The outlet of each tank consists of three 450 mm diameter submerged launderers, which each have Armtec aluminum flat back gates (458 mm x 458 mm) for isolation. They were installed in 2012 and are exercised at a minimum annually (no provision for double block and bleed or blanking). Drawing attached. The total head pressure of water applied to each isolation gate from the upstream channel is 1000 mm or <1.4 psi of head pressure.
   3. One 200 mm adjacent suction pipe installed in 2012 and is isolated by a single Knife Gate. The total head pressure of water applied to the knife gate from the upstream side is 8 m or 12 psi of head pressure.
   4. One 150 mm adjacent gravity drain pipe installed in 2012 and is isolated by a single Knife Gate. The total head pressure of water applied to the knife gate from the upstream side is 8 m or 12 psi of head pressure.
3. Glenn Robertson, CRSP the City’s Safety Coordinator 250-490-2553 [glenn.roberston@penticton.ca](mailto:glenn.roberston@penticton.ca) administers the Confined Space program for the City of Penticton. Glenn Robertson and Randy Craig (AWWTP Supervisor) prepared the Alternate Measures and Hazard Identification/Risk Assessment (HIRA). This AMC includes information from Gary Marsden (Op III) and Gord Austrom (Op III), workers health and safety representatives at the AWWTP
4. Hazards to be addressed see the attached HIRA. The characteristic of the water on both the upstream and downstream side is that of typical raw screened municipal wastewater. No work will be performed that will contribute to the likelihood of material flowing into the space. Work to be performed under this AMC includes both corrective and preventative maintenance as per the equipment manufacturers Operation and Maintenance manual.
5. Alternate Measures;

* The analysis of valves as a control measure should assume that all valves leak. However, there is no expectation that a properly installed and maintained valve will fail catastrophically if no work is being performed on it. It is recognized that systems will often permit some leakage; a means of pumping out the fluid will be undertaken.
* Any potential leakage from the upstream hand pull gate will be continuously monitored by the standby person and a submersible pump will be used to remove any leakage. The water level in the upstream channel (400 mm freeboard) will be continuously monitored with a local audio/visual high level float. If the water level rises above 200 mm the alarm will sounds and a light will turn on (leaving 200mm of freeboard). The confined space will be evacuated and the issue will be addressed prior to re-entry.



* Any potential leakage from the downstream gates will be continuously monitored by the standby person and a submersible pump will be used to remove any leakage. The level in the downstream channel (460mm freeboard) will be continuously monitored with a local audio/visual high level float. If the water level rises above 200 mm the alarm will sounds and a light will flash (leaving 260mm of freeboard). and the confined space will be evacuated and the issue will be addressed prior to re-entry.
* See moderate hazard entry procedure for ventilation and atmospheric monitoring requirements
* Communication will be verbal between worker and stand-by person. The stand-by person will have radio and cell phone contact
* See attached emergency procedures

1. Workers will be orientated to this AMC and required to sign off on their orientation
2. AMC will be supervised by AWWTP Supervisor and regular visits documented
3. Time frame that the AMC is needed is 3 years, with annual engineering reviews
4. Up to three workers will be allowed in the space
5. The standby person will attend the confined space continuously
6. Decontamination of worker; worker in space will be wearing long sleeve coveralls and all pertinent PPE and if any contamination occurs, coveralls and PPE will be removed and laundered by our coverall service provider (Unifirst). There will also be an emergency wash station available to the worker at the site. Worker can shower if any area of their body gets contaminated.
7. Admin controls included in HIRA are; Installing fence, 3 point stance when on ladder, clean channel floor, good housekeeping, source of CO away from blower, pre flushing of space & sharps, electrical cord safety,
8. If we had to extract the worker it would take <60 sec, to winch him out
9. Response time by the Fire Department is from Station 201 the response time from time of call would be 7min depending on traffic and road conditions
10. Portable gas detector (Industrial Scientific Ventis MX4 <http://www.indsci.com/products/multi-gas-detectors/ventis> ) used to monitor the confined space. The alarm set points are set at; H2S low 5 ppm, high 10 ppm. LEL low 5%, high 10%. CO Low 13 ppm, high 25 ppm, STEL 100 ppm, TWA 25 ppm. O2 low 20.5%, high 23.5 %
11. Evacuation will be by a Pelsue davit arm <http://www.pelsue.com/product/davit-arm-retrieval-system-2/> top mounted to the concrete channel. Rescue Winch is a DBI Self Retracting Lifeline (SRL) model # 23403-1 s/n # 033794, it was certified by Carleton Rescue on Jan 16th 2016
12. To adequately ventilate the 53m long space the work plan will include 6,000 CFM of ventilation equipment (one 3,000 cfm and two 1500 cfm blowers) supplying clean respirable air. The 3000 cfm fan will be maintained at the main work location(s). The other two 1500 cfm fans will be positioned to maintain clean respirable air throughout reminder of the tank.  Additionally, tank lids/covers will be removed at strategic locations along the space.  Due to the length (53m), volume and the number of openings of the tank installing one blower with sufficient capacity to adequately ventilate the space or maintain 20 air changes per hr is impractical.