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Alternate Measures of Control (AMC) for Secondary Clarifier #2 Confined Space Entry

City of Penticton AWWTP
March 13, 2015

Appendix A	Professional Engineers Approval
Appendix B	Drawings of Confined Space
Appendix C	Valve Specifications
Appendix D	Pictures

Alternate Measures Submission Elements:

1. The confined space is an open air circular concrete secondary clarifier. The tank is 25 m in diameter and is just over 4m in depth. The tank floor has a minor slope towards the middle. There are two adjacent pipes; one is a 750 mm gravity feed from the upstream bio reactor. The second feed is a 200 mm pipe that is connected to the suction side of the return pumping system which pumps sludge back to the bio reactor. The purpose for this confined space entry is to replace a 25 year old gear box with a new unit; this work is anticipated to take 3-5 days and is scheduled for the week of April 20th 2015. Future entries would be for emergency repairs only. The space will be emptied with pumps and any residual material will be hosed and cleaned out prior to entry, from above.
2. The space cannot be isolated as per specifications in section 9.18. "Double block and bleed" can't be implemented due to the fact that the pipes are all below grade and there is nowhere to safely bleed to. Blind flanging is impractical on the 750 mm gravity lines as it is buried under ground.
3. Glenn Robertson 250-490-2553 glenn.roberston@penticton.ca (City Safety coordinator) administers the Confined Space program for the City of Penticton, Glenn Robertson and Randy Craig 250 490-2559 randy.craig@penticton.ca (AWWTP Supervisor) prepared the Alternate Measures and Hazard Identification/Risk Assessment
4. Two adjacent pipes are potential hazards for this space;
    a. A 750 mm gravity feed has a buried butterfly valve which will provide one point of isolation; it was installed in 1990 and is exercised annually. Specification sheet attached Appendix C. Total head of water from the bio reactor (upstream tank) to the bottom of the clarifier is 6.028 m or 8.5 psi of head. The liquid contained in this pipe is from a secondary WWTP

process, which contains many different types of microorganism found in a typical Secondary Wastewater Treatment Plant, temperature range of 12-20 ^{0}C and pH of 7.0.

b. The secondary feed is a 200 mm pipe that feeds a pumping system from the center sump of the tank; it will be isolated by a knife gate that was installed in 2013, engineered drawing attached (Appendix C). The potential head on this knife gate is the same as the 750 mm gravity valve as both valves are holding back the same amount of head. 343.443 m bottom elevation of tank is 337.415 m = 6.028 m or 8.5 psi. The pipe contains the same liquid as the 750 mm.

5. Alternate Measures;

- 750 mm Butterfly is buried and will be closed and locked out. 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. The center column that feeds the clarifier will be pumped down to the 90 deg bend (See Appendix B) and visual checks will be performed every 20 minutes while space is occupied, if the water level is observed rising in the stilling well (leakage) that level will be measured and recorded and if required we can pump that liquid out to a safe area. If excessive leakage is observed the confined space will be evacuated and the issue will be addressed prior to re-entry. These duties will be carried out by the assigned standby person who will be stationed at the entrance to the confined space and will be in constant communication with workers inside confined space.

- 200 mm knife gate will be close and locked out. P. Eng. signed drawing attached (Appendix C). Any potential leakage will be monitored in the center sump. Any Leakage will be pump out to a safe area. These duties will be carried out by the assigned standby person who will be stationed at the entrance to the confined space and will be in constant communication with workers inside confined space.

- Medium Hazard Confined Space Entry Procedures will be followed, which includes continuous ventilation and continuous atmospheric monitoring.
- AWWTP Confined Space Emergency Procedure will be followed.

6. Workers will be orientated to AMC and required to sign off on their orientation.
7. AMC will be supervised by AWWTP Supervisor and regular visits documented.
8. Time frame that the AMC needed is 1 year as per Engineers letter.