



Date: July 13, 2020

Attention: Don MacFadgen
Senior Regional Officer
WorkSafe BC
4980 Wills Road Nanaimo, BC
V9T 6C6

EXAMPLE ONLY

Attention Mr. MacFadgen,

Re: Application for Acceptance of Alternate Isolation Measures for Confined Space Entry – Wellington and Chase River Pump Station Wet Wells

Enclosed is The Regional District of Nanaimo – Greater Nanaimo Pollution Control Centre's application for acceptance of updated alternate isolation measures for access into the Wellington and Chase River Pump Station Wet Wells. These spaces are very similar and therefore a combined application is being submitted. The spaces are located within the Regional District of Nanaimo, both specifically within the City of Nanaimo.

This is the second time an application for these spaces is being submitted. Previously Occupation Hygiene Officer Sus de Leeuw was the issuing officer, **201916961065A**. There are no changes from the initial application with the exception of the requesting the new acceptance be valid for a period of 5 years as this is very routine work.

In putting together this application, we have worked extensively with our qualified persons, Jason Hindson, CRSP and Karren Kossey, CRSP of ORCA Health and Safety Consulting Inc. (ORCA), to create the required documents in support of this application. Please feel free to communicate with them directly in regard to this application.

We are available and prepared to meet with you to answer any questions that you may have in order to ensure that this application is accepted in a timely manner.

I can be reached by telephone at 250-816-2767 (cell).

Sincerely,

A handwritten signature in black ink, appearing to read "R. Skwarczynski", with a long horizontal flourish extending to the right.

Robert Skwarczynski
Chief Operator
Greater Nanaimo Water Pollution Control Centre



Attachments:

- 1) 9.22 Application – Wellington and Chase River Pump Station Wet Wells
- 2) JHSC Representative letter confirming review of 9.22 Application
- 3) Wellington and Chase River Pump Station Wet Wells - Hazard Assessment
- 4) Wellington and Chase River Wet Wells - Entry Procedure
- 5) Isolation Procedure for Wellington Pump Station Wet Well (WPS)
- 6) Isolation Procedure for Chase River Pump Station Wet Well (CRPS)
- 7) Diagram 1 (Side Profile of Wellington Wet Well)
- 8) Diagram 2 (Side Profile of Chase River Wet Well)
- 9) Confined Space Rescue Plan
- 10) Written Rescue Agreement with City of Nanaimo Fire Department

EXAMPLE ONLY

Wellington and Chase River Pump Station Wet Wells

9.22 Application for Alternate Isolation Procedures

1.0 Overview/ Description of Space

The Regional District of Nanaimo (RDN) – Greater Nanaimo Water Pollution Control Centre requests approval of alternate isolation measures for its workers and contractors to enter two spaces. Specifically, Wellington Pump Station Wet Well and Chase River Pump Station Wet Well. Once the spaces are isolated, as per the submitted alternate isolation measures, the wet wells will have any residual grit removed via a vacuum truck, if deemed necessary. The planned tasks will not have an impact on the isolation means.

The wet wells are located at the bottom of pump stations. To access the wet well a worker must pass through the station to reach the access hatches to the wet wells themselves. The portion of the pump station the worker must pass through is designed for continuous human occupancy. Wellington Pump station has a ladder to access its lower portion while Chase River has stairs (see Diagram 1 and 2 included in this application package). To enter each of these a safe work procedure has been developed.



Wellington Pump Station Wet Well



Chase River Pump Station Wet Well

2.0 Why Isolation is Not Practicable as Specified in 9.18 of the OHSR

Isolation of these spaces as per 9.18 of the regulations is not possible because of the design of the system. This system relies on the use of valves and sluice gates to isolate flows to allow for maintenance and repairs. The cost of upgrading the system to meet 9.18 is not practicable.

3.0 Confined Space Administrator

Ian Lundman
Operations Superintendent
RDN - Wastewater Services
250-758-1157
ilundman@rdn.bc.ca

Qualified Person(s)

Jason Hindson, CRSP – ORCA Health and Safety Consulting Inc.
(250) 618-6022
j.hindson@orcasafety.ca

Karren Kossey, CRSP – ORCA Health and Safety Consulting Inc.
(250) 618-3481
k.kossey@orcasafety.ca

4.0 Description of Hazards and Associated Alternate Measures Used to Control Hazards

A. Atmospheric Hazards: Oxygen Deficiency, Hydrogen Sulfide, Methane (LEL)

There is a potential for decomposition gases, specifically hydrogen sulphide and methane (H₂S and CH₄ respectively). Consumption of oxygen occurs when organic matter breaks down, thus, lack of oxygen is also possible.

To control atmospheric hazards in these wet wells the space will first be isolated, cleaned as much as possible from the outside and then supplied with positive pressure dilution ventilation will be used. The space will be ventilation for 15 minutes before entry and continuously while the entrant in in the space.

Atmospheric Hazard Controls

- **Washing from Outside**

The possibility exists that gases will be trapped in the residual material that will remain after draining the spaces. Before entering the spaces, they will be washed from the deck level as much as possible. The majority of remaining material will be grit, coarse sand and gravel. If the is sufficient grit and it is decided it must be removed, the goal will be to remove as much as possible without entering the space. However, before entering the space, any remaining sewer debris and grit will at least be disturbed with a hose to release any potentially trapped gases BEFORE completing ventilation prior to entry. In addition, while washing the wet wells, the pumps will remain running allowing water to be drawn up the outlets and remain in the pipes, held back by a valve and check valve, rather than simply containing sanitary sewage.

- **Gas Monitoring:**

The entrant will wear a 4-gas monitor into the space.

4 Gas Monitor Alarm settings:

Gas		Low Alarm	High Alarm
Oxygen	O ₂	20.5%	22.0%
Hydrogen Sulfide	H ₂ S	5 ppm	10 ppm
Lower Explosive Limit (Cal. To Methane, CH ₄)	LEL	5%	10%
Carbon Monoxide	CO	10 ppm	25 ppm

- The gas monitor will be calibrated, as per the manufacturers specifications and bump tested on the same day prior to use.
- The spaces will be tested prior to entry for oxygen (O₂) deficiency, LEL %, Hydrogen Sulfide (H₂S), Carbon Monoxide (CO).
- The space will be continuously monitored by the entrant wearing a 4-gas monitor into the space.
- If the monitor alarms, the entrant must immediately identify why and if the reason is not known, the entrant must exit the space.
- Re-entry will be authorized only when the entrant's supervisor has determined that any identified issue has been adequately addressed.
- 4 Gas-monitor will be logged on the entry permit at least every 20 minutes by the standby person.
- Standby person will be in continuous communication with entrants by voice.
- **Ventilation:**
 - Each wet well will be ventilated by blowing 900 cfm into space for 15 minutes prior to entry and continuously while in space.
 - This will provide ~20 air exchanges per hour or a complete air exchange every 3 minutes.
 - Ventilation will provide dilution ventilation (positive pressure).
 - Ensure the intake of the fan for the wet wells is near the outlet, the end of the poly duct, of the bigger fan.
 - The duct will be extended within 24" of the bottom of the space.
 - Ensure the end of the duct is within 10 ft. of the entrant's location and preferably directed toward him/her.
 - Ensure the fan is set up so that fresh air is being drawn from the outside.
 - In addition to general dilution ventilation, the vacuum truck will provide a limited degree of point source exhaust ventilation as the grit is being disturbed/pulled from the space.
- **Isolation:**
 - The incoming flow to the wet wells will be stopped by sluice gates, one for each space. Fluid will remain against the sluice gate within the pipe. This will greatly reduce any potential for gases to seep past the isolation means, the sluice gate, and into the space. The outlets will have water in them, as a result of washing, again greatly reducing the risk of any gases from entering the space through the planned isolation means.

B. Infectious Hazards – Sewer Exposure

These Wet Wells are part of the sanitary sewage collection system. Hepatitis A is the most prevalent infectious hazard from sewer systems. Excessive contact with sewage has been found to increase the exposure to Hepatitis A. Other hazards include giardiasis and leptospirosis.

During normal operation, untreated sanitary sewage collected from the residents of Nanaimo is collected in both wet wells from which it is pumped to a force main and travels to the Greater Nanaimo Pollution Control Centre for treatment.

Before entering, the wet well will be drained, flushed and then washed with a hose. However, there will be up to approximately 1 foot of grit, mostly coarse sand and gravel, remaining in the bottom. This is the material to be removed by the vacuum truck, if deemed necessary.

Infectious Hazard Controls

- The wet wells will be drained, flushed and washed with a hose from the outside prior to entry. An infectious hazard potential will be reduced but still presented.
- Entrants will wear Tyvek Coveralls, Rubber CSA Safety Toe Boots, Hard Hat, Nitrile and Work Gloves and Safety Glasses, Full-face respirator with P100/OV/AG cartridges.
- Once the space is fully washed and it is being inspected the entrants can wear coveralls instead of Tyvek.
- Do NOT use hands to handle any material in the space. Only use tools.
- Decontamination with soap and water after immediately exiting the space is required.
- All staff that are exposed to biological sewage hazards are offered Hepatitis B immunizations from the RDN

C. Isolation/ Lock-out Hazards

Each Wet Well has a number of adjacent pipes that must be isolated. Below is a summary of those points and the pipes contents. See the attached isolation procedure for each Wet Well.

Adjacent Piping and Contents	
 Adjacent Piping – Wellington Wet Well <ul style="list-style-type: none"> • 36 in. Inlet Pipe – Sanitary Sewage. • 3 x 8 in. Outlets via pumps • 12 in. force main 	Adjacent Piping – Chase River Wet Well <ul style="list-style-type: none"> • 42 in. Inlet Pipe – Sanitary Sewage • 7 x 8 in. Outlets via pumps • 4 in. Sani-Truck Dump Inlet • 20 in. Overflow bypass • 8 in. Force main drain

Isolation Controls

Adjacent Piping – Wellington Wet Well	
ISOLATION POINT	CONTROL METHOD
 <ul style="list-style-type: none"> • 36 in. Inlet Pipe – Sanitary Sewage 	 <ul style="list-style-type: none"> • Close and lockout sluice gate.
 <ul style="list-style-type: none"> • 3 x 8 in. Outlets via pumps (wet well currently has 3 pumps) – Sanitary sewage 	 <ul style="list-style-type: none"> • Close and lockout plug valves.
 <ul style="list-style-type: none"> • 12 in. force main – fed by outlets via pumps - isolation valve 	 <ul style="list-style-type: none"> • ¼ Turn Plug Valve as well as a water actuated plug valve

Adjacent Piping – Chase River Wet Well	
ISOLATION POINT	CONTROL METHOD
<ul style="list-style-type: none"> 42 in. Inlet Pipe – Sanitary Sewage 	<ul style="list-style-type: none"> Close and lockout sluice gate.
<ul style="list-style-type: none"> 7 x 8 in. Outlets via pumps 	<ul style="list-style-type: none"> Close and lockout plug and air actuated valves.
<ul style="list-style-type: none"> 4 in. Sani-Truck Dump Inlet - 	<ul style="list-style-type: none"> Cap, lock Sani-Truck Inlet to Wet well. Also notify collection companies, post signage and erect barriers around dumping bay.
<ul style="list-style-type: none"> 20 in. Overflow bypass 	<ul style="list-style-type: none"> Close and lockout bypass valve to wet well
<ul style="list-style-type: none"> 8 in. Force main drain 	<ul style="list-style-type: none"> Isolate with inflatable plug. This is to isolate any atmospheric hazard and not a pressure one.

D. Engulfment/ Immersion Hazards

There is a risk of engulfment associated with entry into these spaces. Specifically, from the 36 in and 42 in. inlets and backflow from the outlets through which the material is normally pumped.

Engulfment Controls

In addition to the isolation procedures, because of the engulfment risk, some isolation points MUST BE certified by a Professional Engineer and those certifications valid and current DURING the entry. At this time, to maximize the use of such certification, the isolation points have not been inspected by a Professional Engineer yet. This will occur once the Alternate Isolation Measures have been accepted but BEFORE any entry is made.

Isolation Points Requiring Professional Engineer Certification	
 Adjacent Piping – Wellington Wet Well <ul style="list-style-type: none"> 36 in. Inlet – Sluice Gate 3 x 8 in. Outlets via pumps – ¼ Turn Plug Valves 	Adjacent Piping – Chase River <ul style="list-style-type: none"> 42 in. Inlet – Sluice Gate 7 x 8 in. Outlets via pumps – ¼ Turn Plug Valves 20" influent chamber bypass

5.0 How Workers will be Informed of the Required Measures Presented in the Approved Application

- JHSC Consultation**

This Alternate Measure application and related documentation (Confined Space Hazard Assessment, Entry and Lockout Procedure as well as the Rescue Plan) have been presented to and reviewed by a JHSC representative (see letter included from JHSC).

- Pre-job meeting** by Supervisor will cover off:

- Confined space hazards, risks and safe entry procedures
- Requirements of this Application Acceptance
- Review of rescue plan and drill

6.0 Supervision of Alternate Measures

- **Standby Person** for (moderate hazard) on Site must:
 - Standby person is to be stationed at or near the access
 - Confirm effective and continuous means to communicate with entrant.
 - Maintain continuous visual contact of entrant.
 - Confirm effective means to summon additional help should it be required
 - Check on the well-being of the entrant(s) regularly (at least every 20 minutes)
 - Ensure that the required controls remain in place and continue to be effective (i.e. intake of fan)
 - Ensure the end of the duct is within 10 ft. of the entrant. Move as necessary.
 - Ensure continuous effective communication between the entrant, standby person and vacuum truck operator
- **Robert Skwarczynski** – is the Chief Operator and oversees the operation of the system.
- **A Trained Supervisor** –will be monitoring crew to ensure compliance with this application.
- **Jason Hindson, CRSP/Karren Kossey, CRSP**– Qualified persons - available to attend site, if requested.

7.0 Time Frame Required for Project Needing Alternate Measures

The RDN needs to enter the wet wells to complete this work as soon as possible to take advantage of the current low system flows. This work is considered routine and is completed every year. It is therefore requested that the acceptance be valid for a period of at least 5 years which will give the RDN the opportunity to complete maintenance work annually. It is understood that if the tasks to be completed are different than those presented, a new application will need to be submitted.

Completed and Reviewed by the following people.

Robert Skwarczynski
RDN GNPCC
Chief Operator

Spencer Clarke
RDN GNPCC
JHSC Representative

Jason Hindson, CRSP
Orca Health and Safety
Consulting Inc.



Date: July 13, 2020

EXAMPLE ONLY

Attention: Don MacFadgen
Senior Regional Officer
WorkSafeBC
4980 Wills Road
Nanaimo, B.C.
V9T 6C6

Attention Mr. MacFadgen,

**Re: Regional District of Nanaimo – Greater Nanaimo Water Pollution Treatment Centre JHSC
Consultation of the Application for “Acceptance of Alternate Isolation Measures for Confined Space
Entry into Wellington and Chase River Pump Station Wet Wells”.**

In order to proceed with the work to be done explained in the 9.22 application for **“Acceptance of Alternate Isolation Measures for Confined Space Entry into Wellington and Chase River Pump Station Wet Wells”**, according to WorkSafeBC Guideline 9.22, accompanying documentation should also include information from the Joint Health and Safety Committee indicating the committee’s comments on the proposal, or other information that indicates the affected party has been consulted on the alternate measures.

Based on review of the application **“Acceptance of Alternate Isolation Measures for Confined Space Entry into Wellington and Chase River Pump Station Wet Wells”** and associated documentation, there are no comments at this time.

Sincerely,







A handwritten signature in black ink that reads "S. Clarke".

Spencer Clarke
JHSC Representative
RDN – Greater Nanaimo Water Pollution Control Centre

Wellington and Chase River Pump Stations Wet Wells Confined Space Hazard Assessment

EXAMPLE ONLY

* Inspection/Wash Well and Remove Grit with Vacuum Truck *

Confined Space Location(s):		Date of Site Visit: March 4, 2019																			
Wellington Pump Station - 5200 Fillinger Cres. Nanaimo, BC		Date of documentation: May 4, 2019																			
Chase River Pump Station - 1174 Island Highway South, Nanaimo, BC.		Date of Revision: July 14, 2020																			
Task this assessment is for: <ul style="list-style-type: none">InspectionWash Well AreaRemove grit with vacuum truck (as required, based on an on-site assessment)		<ul style="list-style-type: none">Pipe fitting/Replacing Pump Bases (Anchoring Pipes – Drilling Concrete)Cutting and grinding as needed with a zip cutter/grinderWelding to Repair Pipes (Welding a patch onto uncoated carbon steel) - SMAW																			
Description	Findings																				
Describe Space (size, openings, access, materials of construction)	<div></div>																				
	<div><div>Space Dimensions</div><table><tr><td></td><td>Wellington</td><td>Chase</td></tr><tr><td>Length</td><td>-</td><td>-</td></tr><tr><td>Width</td><td>-</td><td>-</td></tr><tr><td>Height</td><td>12 ft.</td><td>9 ft.</td></tr><tr><td>Diameter</td><td>16 ft.</td><td>20 ft.</td></tr><tr><td>VOLUME</td><td>2,412 ft³</td><td>2,827 ft³</td></tr></table></div>				Wellington	Chase	Length	-	-	Width	-	-	Height	12 ft.	9 ft.	Diameter	16 ft.	20 ft.	VOLUME	2,412 ft³	2,827 ft³
		Wellington	Chase																		
	Length	-	-																		
	Width	-	-																		
	Height	12 ft.	9 ft.																		
	Diameter	16 ft.	20 ft.																		
VOLUME	2,412 ft³	2,827 ft³																			
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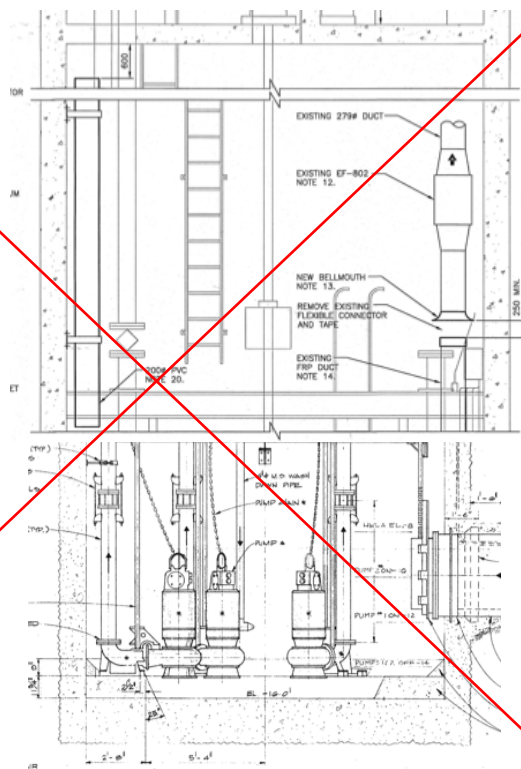
Wellington and Chase River Pump Stations Wet Wells Confined Space Hazard Assessment

EXAMPLE ONLY

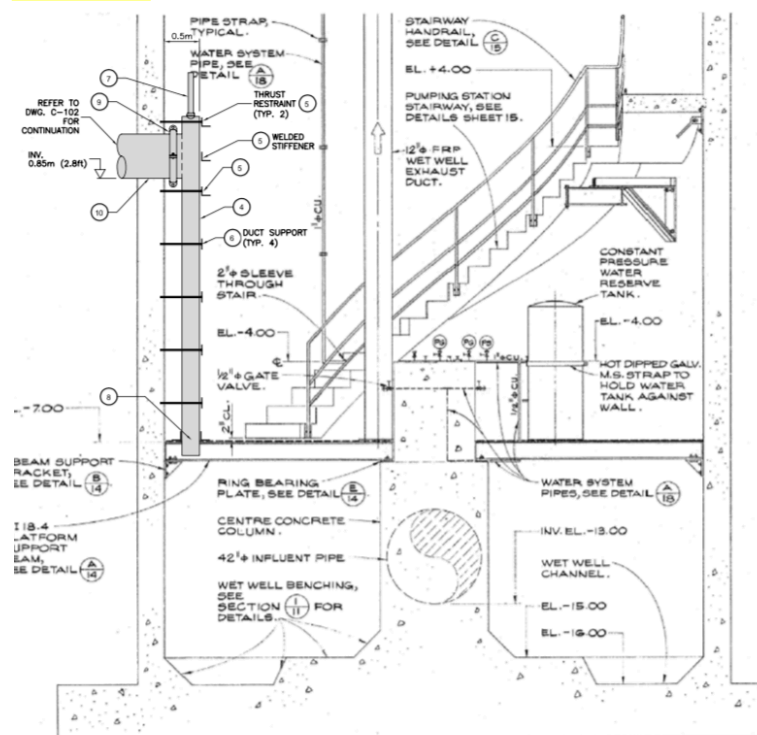
* Inspection/Wash Well and Remove Grit with Vacuum Truck *

Two concrete wet wells, that are similar. They are each located at the bottom of large pump stations. Their lid is constructed of checker plating and separates the wet well from the rest of the pump station. To access each wet well, workers must pass through the pump station before descending down a fixed ladder through a hatch. The pump station itself, above the wet well, is designed for continuous human occupancy. Chase River PS has a set of stairs and Wellington has a fixed ladder. This document and its accompanying entry procedure are limited to identifying hazards and prescribing controls for ONLY entering the wet wells and not the pump stations. Safe work procedures are in place for workers who enter and conduct work inside of the pump stations.

Wellington



Chase River



Use of Space:

Temporary storage and pumping of sanitary sewage as part of a sewage collection system.

Equipment Inside:

Pumps, Piping, Valves


Space Contents:

Untreated sanitary sewage and grit consisting of sand and gravel.

Wellington and Chase River Pump Stations Wet Wells Confined Space Hazard Assessment

EXAMPLE ONLY

* Inspection/Wash Well and Remove Grit with Vacuum Truck *

Piping:	Wellington Pump Station Wet Well<ul style="list-style-type: none">36 in. Inlet Pipe – Sanitary Sewage5 x 8 in. Outlets via pumps (wet well currently has 3 pumps) – Sanitary sewage4 in. Inlet – Drain – Wash Down By-Pass Pipe3 in. Inlet – Drain –From the MCC Floor and Wet Well Platform Drain.		Chase River Pump Station Wet Well <ul style="list-style-type: none">42 in. Inlet Pipe – Sanitary Sewage7 x 8 in. Outlets via pumps – Sanitary Sewage4 in. Sani-Truck Dump Inlet (indirectly flows into Wet Well) – Sanitary Sewage20 in. Overflow bypass8 in. Force main drain line #1 and #2			
Describe Access Points	1.		Access to each wet well is through a hinged hatch and a fixed ladder. However, each wet well has a number of pie shaped hatches that allow the pumps to be pulled that can also be used to raise/lower equipment and maintain a visual on the entrant. Additionally, the wet well can be accessed by these via a portable ladder. The pie shaped hatches are 52 in. to 66 in. long and 52 in. wide at their widest point and 18 to 33 in. at their narrowest (see pictures above).	Access Dimensions		
					Welling.	Chase
				Length	33 in.	24 in.
				Width	30 in.	24 in.
				Diameter	-	-
Describe Adjacent Spaces	There is a staging area above the space where a vacuum truck will be parked.					

Is it a Confined Space?				
NOTE: if the answer to all of the first four questions is YES then it is a confined space				
Assessment	Yes	No	Explanation	
Is there a limited or restricted means of entry/exit for rescue purposes? (Can two people walk in & out with a stretcher without unreasonable effort?)	✓		Access to the space is via a fixed or portable ladder.	
Is the space not intended for human occupancy? (Spaces that are intended for human occupancy have an easy access and adequate lighting and ventilation.)	✓		The space is used for the temporary storage and pumping untreated sewage.	
Is the space enclosed or partially enclosed? (enclosed enough to restrict ventilation)	✓		Partially enclosed.	
Is the space large enough for a worker to enter? (it must be big enough to physically get inside and a worker is considered to have entered a confined space once their breathing zone has broken the plane of the confined space)	✓		2,412 ft ³	2827 ft ³
Is this a Confined Space?	YES			

Wellington and Chase River Pump Stations Wet Wells Confined Space Hazard Assessment

EXAMPLE ONLY

* Inspection/Wash Well and Remove Grit with Vacuum Truck *

Excluded space with no ability for a toxic atmosphere to exist or develop prior to entry (crawl space/ attic with passive ventilation, excavations, swimming pools, new/unconnected manholes for storm or sewer that have not been hooked up yet)		x	
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Question	Yes	No	Hazard	Controls
1. Is there a potential for oxygen enrichment/ deficiency ?	✓		Deficiency <ul style="list-style-type: none"> Rusting components Organic decomposition of sanitary sewage. 	<ul style="list-style-type: none"> 4 gas-monitor prior to entry and continuously while entrant(s) in space Use a 5000 CFM fan to provide ventilation to the bottom of the pump station, the lid area of the wet well. Ventilate the wet well itself by blowing 900 cfm into space for 15 minutes prior to entry and continuously while in space. Ensure end of duct extends within 24" of the bottom of the space and within 10 ft. of the worker.
2. Is there a potential for flammable/ explosive gases/vapors ? Specify.	✓		<ul style="list-style-type: none"> Methane (CH₄) – Decomposition (anaerobic) of sanitary sewage - Spaces direct sanitary sewage as part of treatment process. Grinding/Zip Cutting/Welding Carbon Steel <ul style="list-style-type: none"> Sparks 	<ul style="list-style-type: none"> Wash as much of the space from the deck level without entering as possible. The majority of remaining material will be grit with minimal organic content. If grit is to be removed, remove as much grit as possible without entering the space. Organic/Sanitary sewer debris that cannot be removed by washing from the outside must at least be disturbed and disturb the remaining grit as much as possible from outside of the space BEFORE ventilation and entry. Allow pumps to run while washing space from the outside to flush outlets and allow water to remain in outlet pipes rather than sanitary sewage. 4 gas-monitor prior to entry and continuously while entrant(s) in space Use a 5000 CFM fan to provide ventilation to the bottom of the pump station, the lid area of the wet well. Ventilate the wet well itself by blowing 900 cfm into space for 15 minutes prior to entry and continuously while in space.

Wellington and Chase River Pump Stations Wet Wells Confined Space Hazard Assessment

EXAMPLE ONLY

* Inspection/Wash Well and Remove Grit with Vacuum Truck *

Question	Yes	No	Hazard	Controls
				<ul style="list-style-type: none"> ○ Ensure end of duct extends within 24" of the bottom of the space and within 10 ft. of the worker and preferably directed toward him/her. <p>Grinding/Zip Cutting/Welding Carbon Steel</p> <ul style="list-style-type: none"> ○ To be completed after the space is washed and ventilated. ○ <i>Grinder/Zip</i> - Entrant must change into/wear coveralls that are FR/Cotton, wear safety glasses with side shields, face shield, work gloves and half face respirator with P100 cartridges. ○ <i>Welding</i> - Entrant must change into/wear coveralls that are FR/Cotton, wear welding shield, leather gauntlet gloves, half face respirator with P100/OV cartridges and hearing protection. ○ Keep combustibles out of the space ○ Have a fire extinguisher readily available
3. Is there a potential for toxic gases/vapors ? Specify.	✓		<ul style="list-style-type: none"> • Hydrogen Sulphide (H₂S) – Decomposition (anaerobic) of sanitary sewage – Spaces collect and pump sanitary sewage. • Chase River Pump Station has a Sani-Truck Dump Inlet. Chase River Pump Station has a Sani-Truck Dump Inlet. When trucks dump their load operators have experienced H₂S readings >5ppm in the wet well. Otherwise, elevated H₂S levels do NOT occur in the Chase River Wet Well. • Carbon Monoxide (CO) – From small engine and vehicles including the vacuum truck. • Carbon monoxide from zip cutting, grinding and welding 	<ul style="list-style-type: none"> • Chase River Pump Station - Cap, lock Sani-Truck Inlet to Wet well. Also notify collection companies, post signage and erect barriers around dumping bay. • Wash as much of the space from the deck level without entering as possible. The majority of remaining material will be grit with minimal organic content. • If grit is to be removed, remove as much grit as possible without entering the space. • Organic/Sanitary sewer debris that cannot be removed by washing from the outside must at least be disturbed and disturb the remaining grit as much as possible from outside of the space BEFORE ventilation and entry. • Allow pumps to run while washing space from the outside to flush outlets and allow water to remain in outlet pipes rather than sanitary sewage. • 4 gas-monitor prior to entry and continuously while entrant(s) in space

Wellington and Chase River Pump Stations Wet Wells Confined Space Hazard Assessment

EXAMPLE ONLY

* Inspection/Wash Well and Remove Grit with Vacuum Truck *

Question	Yes	No	Hazard	Controls
				<ul style="list-style-type: none"> Carbon Monoxide sensor will be used as an indicator sensor for all products of combustion. Entrant to wear a full-face respirator with P100/OV/AG cartridges for cleaning inside of the space. Use a 5000 CFM fan to provide ventilation to the bottom of the pump station, the lid area of the wet well. Ventilate the wet well itself by blowing 900 cfm into space for 15 minutes prior to entry and continuously while in space. Ensure the exhaust from both pump station ventilation system does not encroach on the intake of the ventilation fan. Set up fan so that it is drawing air from outside of the space. Ensure end of duct extends within 24" of the bottom of the space and within 10 ft. of the worker. Move the duct as required. As the grit is being disturbed/pulled from the space, the suction from the hose will provide a degree of localized exhaust ventilation. Ensure vehicles/small equipment do not idle/run within 25 ft. of space or intake of ventilation fan. Use an exhaust extension on vacuum truck to direct exhaust away from the site, as required. Welding requires localized exhaust control, either a smoke eater or a localized exhaust fan
4. Is there a potential for dusts, particulates, vapors, fumes? Specify	✓		<ul style="list-style-type: none"> Vapour from washing that may contain biohazards. Raw sewage can contain bacteria, viruses, protozoa, parasitic worms, fungi that cause illnesses such as hepatitis, typhoid fever, dysentery, cholera etc. Inhaling or ingesting contaminated mists can result in these illnesses. 	<ul style="list-style-type: none"> Use a 5000 CFM fan to provide ventilation to the bottom of the pump station, the lid area of the wet well. Ventilate the wet well itself by blowing 900 cfm into space for 15 minutes prior to entry and continuously while in space. Set up fan so that it is drawing air from outside of the space. Ensure end of duct extends within 24" of the bottom of the space and within 10 ft. of the worker. Move the duct as required. Entrant to wear a full-face respirator with P100/OV/AG cartridges for cleaning inside of the space.

Wellington and Chase River Pump Stations Wet Wells Confined Space Hazard Assessment

EXAMPLE ONLY

* Inspection/Wash Well and Remove Grit with Vacuum Truck *

Question	Yes	No	Hazard	Controls
			<ul style="list-style-type: none"> Historically (informed by RDN employees), when washing from the outside of the wet well, vapour does not enter the pump station from below. <p><i>Zip Cutting/Grinding Mild Steel (no coatings) and Welding on Patch - SMAW (on uncoated, corroded mild steel)</i></p> <ul style="list-style-type: none"> Carbon Steel contains iron, chromium and nickel primarily. Grinding and cutting will produce fume with oxides and particulate which are skin, eye, and respiratory irritants. They can all produce Metal Fume Fever (flu like symptoms with sweet/ metallic taste in mouth) and are carcinogens over long periods of exposure. <p><i>Pipe Fitting/Replacing Pump Bases (Drilling Concrete to mount/remount pipes)</i></p> <ul style="list-style-type: none"> Mechanically disturbing concrete (drilling, cutting) releases silica, a carcinogen. 	<ul style="list-style-type: none"> Pump stations are fitted with fixed ventilation system that draws air from the work area above the wet well, ABOVE the checker plated wet well lids. Ensure this system is running during the duration of the work. <p><i>Grinding/Zip Cutting Carbon Steel</i></p> <ul style="list-style-type: none"> To be completed after the space is washed and ventilated. Entrant must change into/wear coveralls that are FR/Cotton, wear safety glasses with side shields, face shield, work gloves and half face respirator with P100 cartridges. <p><i>Welding on Patch - SMAW (on uncoated, corroded, mild steel)</i></p> <ul style="list-style-type: none"> To be completed after the space is washed and ventilated. Entrant must change into/wear coveralls that are FR/Cotton, wear welding shield, leather gauntlet gloves, half face respirator with P100/OV cartridges and hearing protection. Welding requires localized exhaust control, either a smoke eater or a localized exhaust fan <p><i>Pipe Fitting (Drilling Concrete to mount/remount pipes)</i></p> <ul style="list-style-type: none"> Entrant must use wet methods/HEPA attachment when drilling concrete and wear minimum ½ face respirator with P100 cartridges.
5. Is there any hazard(s) due to the confined space location? (Physical in nature - traffic, below grade, above grade, nearby power lines)	✓		<ul style="list-style-type: none"> Below grade – possible for gases heavier than air to migrate into space 	<ul style="list-style-type: none"> 4 gas-monitor prior to entry and continuously while entrant(s) in space Use a 5000 CFM fan to provide ventilation to the bottom of the pump station, the lid area of the wet well. Ventilate the wet well itself by blowing 900 cfm into space for 15 minutes prior to entry and continuously while in space.

Wellington and Chase River Pump Stations Wet Wells Confined Space Hazard Assessment

EXAMPLE ONLY

* Inspection/Wash Well and Remove Grit with Vacuum Truck *

Question	Yes	No	Hazard	Controls
6. Are there any nearby hazards which may affect this confined space (drawing in air contaminants)?		x		
7. Are there any hazards due to the confined space's design/structure (hidden openings, tight quarters, obstacles, protruding objects, crush hazards, pinch hazards, etc.)?	✓		<ul style="list-style-type: none"> Access will be via a fixed or portable ladder from the cat walk. The wet well is covered by a deck with multiple hatches. 	<ul style="list-style-type: none"> Portable ladder must extend 3 rungs beyond railing and secured in place. Maintain 3-point contact when using ladder to descend into Wet Well. Entrant to be connected to fall protection when using any ladder. Maintain visual contact of the worker at all times while he/she is completing required tasks.
8. Are there any hazards due to the confined space's materials of construction (fiberglass, leaching, rusting metal tank, rotting materials, obstructions etc.?)	✓		<ul style="list-style-type: none"> Wet Well constructed of concrete which when mechanically disturbed will release silica, a known carcinogen (i.e. drilled, ground, cut). Metal components – corrosion/rusting which consumes oxygen 	<ul style="list-style-type: none"> If drilling of concrete is required, use wet methods or a HEPA attachment When drilling concrete, entrant must wear Entrainment must change into/wear coveralls, wear safety glasses with side shields, work gloves and half face respirator with P100 cartridges. 4 gas-monitor prior to entry and continuously while entrant(s) in space
9. Are there any hazards due to the confined space's USE (toxic, corrosive, or other materials, residues, or purge gases,	✓		<ul style="list-style-type: none"> The space is used for the collecting and pumping untreated sewage. Once drained there will be approximately 1 foot of grit, accumulation on floor of space. 	<ul style="list-style-type: none"> Wash as much of the space from the deck level without entering as possible. The majority of remaining material will be grit with minimal organic content. If grit is to be removed, remove as much grit as possible without entering the space. Organic/Sanitary sewer debris that cannot be removed by washing from the outside must at least be disturbed and disturb the

Wellington and Chase River Pump Stations Wet Wells Confined Space Hazard Assessment

EXAMPLE ONLY

* Inspection/Wash Well and Remove Grit with Vacuum Truck *

Question	Yes	No	Hazard	Controls
bridging of materials, etc.)?				remaining grit as much as possible from outside of the space BEFORE ventilation and entry.
10. Are there any energy sources that could cause injury if released? (electrical, mechanical, hydraulic, pneumatic, thermal, steam)	✓		<ul style="list-style-type: none"> Pumps Sensors Welding Equipment 	<ul style="list-style-type: none"> De-energize and lockout pumps. At Chase River Pump Station one pump must be left in standby mode. This is due to the sensitivity of the area overflowing to the river and the limited shutdown duration. This will allow the pump to be turned on immediately as the entrant exits the space. Explain to workers which pump is in standby mode and tag out at HMI Panel. Ensure there is a communication strategy in place and a procedure prior to entering the space. Follow written de-energization/lockout procedures Ensure Welding equipment is used as per manufacturer's directions and training.
11. Isolation of pipes required? (gas, solid, fluid) If yes, a written lockout/isolation procedure is required.	✓		<p>Wellington Pump Station Wet Well</p> <ul style="list-style-type: none"> 36 in. Inlet Pipe – Sanitary Sewage 3 x 8 in. Outlets via pumps (wet well currently has 3 pumps) – Sanitary sewage 12 in. force main isolation valve 4 in. Inlet – Drain – Wash Down By-Pass Pipe 3 in. Inlet – Drain – From the MCC Floor and Wet Well Platform Drain. <p>Chase River Pump Station Wet Well</p> <ul style="list-style-type: none"> 42 in. Inlet Pipe – Sanitary Sewage 7 x 8 in. Outlets via pumps – Sanitary Sewage 4 in. Sani-Truck Dump Inlet (indirectly flows into Wet Well) – Sanitary Sewage 20 in. Overflow bypass 	<p>Wellington Pump Station Wet Well</p> <ul style="list-style-type: none"> 36 in. Inlet Pipe – Sanitary Sewage – Close and lockout sluice gate. 5 x 8 in. Outlets via pumps – Close and lockout plug valves. 12 in. force main isolation valve - ¼ Turn Plug Valve as well as a water actuated plug valve 4 in. Inlet – Drain – Wash Down By-Pass Pipe – Close and lockout plug valve <p>Chase Pump Station Wet Well</p> <ul style="list-style-type: none"> 42 in. Inlet Pipe – Sanitary Sewage – Close and lockout sluice gate. 5 x 8 in. Outlets via pumps – Close and lockout plug valves. 4 in. Sani-Truck Dump Inlet - Cap, lock Sani-Truck Inlet to Wet well. Also notify collection companies, post signage and erect barriers around dumping bay. 20 in. Overflow bypass – Close and lockout bypass valve to wet well 8 in. Force main drain – Isolate with inflatable plug. This is to isolate any atmospheric hazard and not a pressure one.

Wellington and Chase River Pump Stations Wet Wells Confined Space Hazard Assessment

EXAMPLE ONLY

* Inspection/Wash Well and Remove Grit with Vacuum Truck *

Question	Yes	No	Hazard	Controls
			<ul style="list-style-type: none"> 8 in. Force main drain - This is to isolate any atmospheric hazard and not a pressure one. 	<p>For BOTH Wet Wells</p> <ul style="list-style-type: none"> Follow written isolation/lockout procedures Alternate Isolation Measure Approval (9.22) required from WSBC
12. Is there potential for entrapment ?		x		
13. Is there any potential for engulfment ?	✓		<p>Wellington Pump Station Wet Well</p> <ul style="list-style-type: none"> 36 in. Inlet Pipe – Sanitary Sewage 3 x 8 in. Outlets via pumps (wet well currently has 3 pumps) – Sanitary sewage <p>Chase River Pump Station Wet Well</p> <ul style="list-style-type: none"> 42 in. Inlet Pipe – Sanitary Sewage 7 x 8 in. Outlets via pumps – Sanitary Sewage 20" influent chamber bypass 	<ul style="list-style-type: none"> Ensure inlet, sluice gates and outlet plug valves are certified by a Professional Engineer. Chase River - 20 in. Overflow bypass – must be certified by a Professional Engineer. Follow written isolation/lockout procedures Alternate Isolation Measure Approval (9.22) required from WSBC
14. Is there a danger from drowning ?	✓		<ul style="list-style-type: none"> The space normally contains sanitary sewage. 	<ul style="list-style-type: none"> Drain/pump out wet wells before entry.
15. Is there any danger of slipping/tripping ?	✓		<ul style="list-style-type: none"> Fixed/Portable Ladder Wet space Uneven surface/floor, grit, accumulated material Standing on equipment, slipping off 	<ul style="list-style-type: none"> Maintain 3-point contact when using ladder. Remain aware and ensure stable footing when working in space Work in a way that the entrant can stand on the bottom of the space rather than on the grit, accumulated material. Remain aware of benched floor. Do not stand on equipment in the space (i.e. pumps)
16. Are there any height hazards that require special consideration? (fall	✓		<ul style="list-style-type: none"> Access via a fixed/portable ladder. Fall into sanitary sewage 	<ul style="list-style-type: none"> Maintain 3-point contact when using ladder. Ensure portable ladder is secure and extend 3 rungs above guardrail.

Wellington and Chase River Pump Stations Wet Wells Confined Space Hazard Assessment

EXAMPLE ONLY

* Inspection/Wash Well and Remove Grit with Vacuum Truck *

Question	Yes	No	Hazard	Controls
arrest harness and lifeline, ladder, scaffolding)				<ul style="list-style-type: none"> Entrant(s) to be connected to a self-retracting lifeline while entering/exiting, using ladder. When using fixed ladder, ensure each rung is stable before fully committing weight. Workers to use fall protection around each access/hatch.
17. Is there a danger from falling objects or process materials? If yes, eliminate the hazard or use PPE as appropriate.	✓		<ul style="list-style-type: none"> No toe rail – falling objects Hoisting Equipment from space 	<ul style="list-style-type: none"> Keep tools at least 3 feet away from space edges – use a designated equipment tarp Do not suspend/hold tools over entrant's head Pass tools/equipment to Entrant(s) with a bucket/rope or using positive hand-off techniques. Entrant(s) to wear hardhat Do not stand below live loads.
18. Are there any noise hazards? (loud tools, hearing injury, communication difficulties) If yes, specify PPE and communication plan.	✓		<ul style="list-style-type: none"> Ineffective communication Large chamber – echoing Use of vacuum truck Zip Cutting/Grinding/Welding 	<ul style="list-style-type: none"> BEFORE starting work ensure effective communication is in place between for completion of ALL TASKS: <ul style="list-style-type: none"> Entrant(s) and Standby Person Standby Person and Emergency Services Communication Strategies: <ul style="list-style-type: none"> VOICE/RADIO to contact standby person/entrant VOICE/RADIO to contact onsite rescue/additional assistance CELL PHONE to contact Emergency Services (911) Do not yell, talk low and steady to communicate Hearing protection when using tools/vacuum truck in the space. Ensure effective communication can be maintained for duration of the entry.
19. Is there any potential skin, ingestion, contact hazard ?	✓		<ul style="list-style-type: none"> Sanitary sewage residue (including sharps) Raw sewage can contain bacteria, viruses, protozoa, parasitic worms, fungi that cause illnesses such as hepatitis, typhoid fever, dysentery, 	<ul style="list-style-type: none"> Wash as much of the space from the deck level without entering as possible. The majority of remaining material will be grit with minimal organic content. If grit is to be removed, remove as much grit as possible without entering the space. Be aware of any residual sewer material

Wellington and Chase River Pump Stations Wet Wells Confined Space Hazard Assessment

EXAMPLE ONLY

* Inspection/Wash Well and Remove Grit with Vacuum Truck *

Question	Yes	No	Hazard	Controls
			<p>cholera etc. Inhaling or ingesting contaminated mists can result in these illnesses.</p> <p>Grinding/Zip Cutting/Welding Carbon Steel</p> <ul style="list-style-type: none"> Hot, sharp surfaces, flying projectiles, disc failure, grit, sparks 	<ul style="list-style-type: none"> Do NOT use hands to handle any material in the space. Only use tools. <p>Cleaning/ Vacuuming of Grit–</p> <ul style="list-style-type: none"> Tyvek, Rubber CSA Safety Toe Boots, Hard Hat, Nitrile and Work Gloves and Safety Glasses, Full-face respirator with P100/OV/AG cartridges. <p>Inspection</p> <ul style="list-style-type: none"> ONCE CLEANED – Coveralls, Rubber CSA Safety Toe Boots, Hard Hat, Nitrile and Work Gloves and Safety Glasses <p>Grinding/Zip Cutting/Welding Carbon Steel</p> <ul style="list-style-type: none"> To be completed after the space is washed and ventilated. Entrant must change into/wear coveralls that are FR/Cotton, wear safety glasses with side shields, face shield, work gloves and half face respirator with P100 cartridges. Ensure guard is in place and the RPM of the grinding/cutting wheel matches that of the tool Follow good hygiene practices, wash with soap and water upon exiting space.
20. Are there any temperature hazards? (hot, cold, wet) If yes, specify appropriate PPE and work schedule.	✓		<ul style="list-style-type: none"> Working in Tyvek <p>Welding on Patch - SMAW (on uncoated, corroded, mild steel)</p> <ul style="list-style-type: none"> UV, high temperature welding arcs, molten metal – Skin and Eye Burns 	<ul style="list-style-type: none"> Ensure workers remain hydrated, dressed appropriately under PPE/TYVEK and are monitored for effects of heat exhaustion. <p>Welding on Patch - SMAW (on uncoated, corroded, mild steel)</p> <ul style="list-style-type: none"> To be completed after the space is washed and ventilated. Entrant must change into/wear coveralls that are FR/Cotton, wear welding shield, leather gauntlet gloves, half face respirator with P100/OV cartridges and hearing protection. Welding requires localized exhaust control, either a smoke eater or a localized exhaust fan
21. Are there any laser or radioactive measuring devices?		x		
22. Is artificial lighting required?	✓		<ul style="list-style-type: none"> No permanent lighting source in the space. 	<ul style="list-style-type: none"> Open hatches above workers location Entrant to wear helmet with light source

Wellington and Chase River Pump Stations Wet Wells Confined Space Hazard Assessment

EXAMPLE ONLY

* Inspection/Wash Well and Remove Grit with Vacuum Truck *

Question	Yes	No	Hazard	Controls
23. Power tools (risk of electrocution)?	✓		<ul style="list-style-type: none"> Electrically powered equipment in a wet environment. 	<ul style="list-style-type: none"> All electrical equipment must use a GFCI.
24. Identify any work specific hazards (not identified already in this assessment)	✓		<ul style="list-style-type: none"> Use of Hand Tools - Soft tissue injuries – manual lifting and awkward postures. 	<ol style="list-style-type: none"> Keep elbows by beltline (don't over reach). Keep load as close to the body as possible. Maintain a stable footing and base of support. Ask for help when needed. Take mini-breaks & stretch as needed.
			<ul style="list-style-type: none"> Vacuum truck hose – suction force at end. 	<ul style="list-style-type: none"> Entrant must maintain visual contact to end of the vacuum truck hose and keep end directed away from him/her. Ensure continuous effective communication between the entrant, standby person and vacuum truck operator
25. Entry Permit Required	✓		<ul style="list-style-type: none"> Isolation/De-Energization/Lockout Risk of Engulfment/Entrapment 	<ul style="list-style-type: none"> YES – Entry Permit Required
26. Rescue	✓		<ul style="list-style-type: none"> Evacuation of injured worker 	<ul style="list-style-type: none"> ENTRY Rescue Required Entrant to wear harness and be connected to fall protection during entry/exit. Follow Rescue Plan Written Rescue Agreement in place with the City of Nanaimo Fire Department

From above assessment (including air quality as well as physical hazards) indicate Hazard Rating prior to critical controls:

Low: _____

Moderate: _____

High: XXXXXX

Critical Control Measures Required:

Hazard Category	Identified Hazard	Requirements
Hazardous Atmosphere	<ul style="list-style-type: none"> Hydrogen Sulphide (H₂S) – Decomposition (anaerobic) of sanitary sewage – Spaces collect and pump sanitary sewage. 	<ul style="list-style-type: none"> Wash as much of the space from the deck level without entering as possible. The majority of remaining material will be grit with minimal organic content. If grit is to be removed, remove as much grit as possible without entering the space.

Wellington and Chase River Pump Stations Wet Wells Confined Space Hazard Assessment

EXAMPLE ONLY

* Inspection/Wash Well and Remove Grit with Vacuum Truck *

	<ul style="list-style-type: none"> Methane (CH₄) – Decomposition (anaerobic) of sanitary sewage - Spaces direct sanitary sewage as part of treatment process. Chase River Pump Station has a Sani-Truck Dump Inlet. Chase River Pump Station has a Sani-Truck Dump Inlet. When trucks dump their load operators have experienced H₂S readings >5ppm in the wet well. Otherwise, elevated H₂S levels do NOT occur in the Chase River Wet Well. 	<ul style="list-style-type: none"> Organic/Sanitary sewer debris that cannot be removed by washing from the outside must at least be disturbed and disturb the remaining grit as much as possible from outside of the space BEFORE ventilation and entry. Allow pumps to run while washing space from the outside to flush outlets and allow water to remain in outlet pipes rather than sanitary sewage. Chase River Pump Station - Cap, lock Sani-Truck Inlet to Wet well. Also notify collection companies, post signage and erect barriers around dumping bay.
Drowning	<ul style="list-style-type: none"> The space normally contains sanitary sewage. 	<ul style="list-style-type: none"> Drain/pump out wet wells before entry.
Engulfment	<p>Wellington Pump Station Wet Well</p> <ul style="list-style-type: none"> 36 in. Inlet Pipe – Sanitary Sewage 5 x 8 in. Outlets via pumps (wet well currently has 3 pumps) – Sanitary sewage <p>Chase River Pump Station Wet Well</p> <ul style="list-style-type: none"> 42 in. Inlet Pipe – Sanitary Sewage 7 x 8 in. Outlets via pumps – Sanitary Sewage 	<ul style="list-style-type: none"> Ensure inlet, sluice gates and outlet plug valves are certified by a Professional Engineer. Chase River - 20 in. Overflow bypass – must be certified by a Professional Engineer. Chase River - 8 in. Force main drain – must be certified by a Professional Engineer. Follow written isolation/lockout procedures Alternate Isolation Measure Approval (9.22) required from WSBC
Hazardous Energy	<ul style="list-style-type: none"> Pumps Sensors 	<ul style="list-style-type: none"> De-energize and lockout pumps. At Chase River Pump Station one pump must be left in standby mode. This is due to the sensitivity of the area overflowing to the river and the limited shutdown duration. This will allow the pump to be turned on immediately as the entrant exits the space. Explain to workers which pump is in standby mode and tag out at HMI Panel. Ensure there is a communication strategy in place and a procedure prior to entering the space. Follow written de-energization/lockout procedures

Wellington and Chase River Pump Stations Wet Wells Confined Space Hazard Assessment

EXAMPLE ONLY

* Inspection/Wash Well and Remove Grit with Vacuum Truck *

Hazard rating once critical controls above are in place:

Low: _____


Moderate: XXXXXX

High: _____

Evaluated by: Jason Hindson, CRSP
Qualified Person(s)
Orca Health & Safety Consulting Inc.

Reviewed By: Rob Skwarczynski
Chief Operator

Zach Suhan
JHSC Representative



Date: May 22, 2019



CONFINED SPACE ENTRY PROCEDURE

EXAMPLE ONLY

Date: May 22, 2019

Revision: July 14, 2020

Space: Wellington and Chase River
Pump Stations, Wet Wells at Bottom

Location: Wellington – 5200 Fillinger Cres. Nanaimo, BC
Chase River - 1174 Island Highway South, Nanaimo

Task(s): Inspection/ Wash Well Area and Remove grit with vacuum truck

1. SCOPE & HAZARD RATING



This confined space entry procedure applies to the task(s) outlined in the “Wellington and Chase River Pump Station, Wet Wells at Bottom” Confined Space Hazard Assessment for the following tasks:

- Inspection
- Wash Well Area
- Remove grit with vacuum truck (as required, based on an on-site assessment)
- Pipe fitting/Replacing Pump Bases (Anchoring Pipes – Drilling Concrete)
- Cutting and grinding as needed with a zip cutter/grinder
- Welding to Repair Pipes (Welding a patch onto uncoated carbon steel) - SMAW

If the planned task(s) will result in the generation of air contaminants other than those listed in hazard assessment for this space and work activity, another risk assessment must be carried out and this procedure must be revised before you proceed.

Overall Hazard Rating - **AFTER** Critical Controls are in Place

MODERATE

2. KEY HAZARD CONTROLS PRIOR TO ENTRY

The Confined Space Hazard Assessment MUST BE reviewed prior to entry and commencement of task(s).

CRITICAL HAZARDS OF SPACE

Hazard Category	Identified Hazard	Requirements
Hazardous Atmosphere	<ul style="list-style-type: none">• Hydrogen Sulphide (H₂S) – Decomposition (anaerobic) of sanitary sewage – Spaces collect and pump sanitary sewage.• Methane (CH₄) – Decomposition (anaerobic) of sanitary sewage - Spaces direct sanitary sewage as part of treatment process.• Chase River Pump Station has a Sani-Truck Dump Inlet. Chase River Pump Station has a Sani-Truck Dump Inlet. When trucks dump their load, operators have experienced H₂S readings >5ppm in the wet well. Otherwise, elevated H₂S levels do NOT occur in the Chase River Wet Well.	<ul style="list-style-type: none">• Wash as much of the space from the deck level without entering as possible. The majority of remaining material will be grit with minimal organic content.• If grit is to be removed, remove as much grit as possible without entering the space.• Organic/Sanitary sewer debris that cannot be removed by washing from the outside must at least be disturbed and disturb the remaining grit as much as possible from outside of the space BEFORE ventilation and entry.• Allow pumps to run while washing space from the outside to flush outlets and allow water to remain in outlet pipes rather than sanitary sewage.• Chase River Pump Station - Cap, lock Sani-Truck Inlet to Wet well. Also notify collection companies, post signage and erect barriers around dumping bay.
Drowning	<ul style="list-style-type: none">• The space normally contains sanitary sewage.	<ul style="list-style-type: none">• Drain/pump out wet wells before entry.



CONFINED SPACE ENTRY PROCEDURE

EXAMPLE ONLY

Date: May 22, 2019

Revision: July 14, 2020

Space: Wellington and Chase River

Location: Wellington – 5200 Fillinger Cres. Nanaimo, BC

Pump Stations, Wet Wells at Bottom

Chase River - 1174 Island Highway South, Nanaimo

Task(s): Inspection/ Wash Well Area and Remove grit with vacuum truck

The Confined Space Hazard Assessment MUST BE reviewed prior to entry and commencement of task(s).

CRITICAL HAZARDS OF SPACE

Hazard Category	Identified Hazard	Requirements
Engulfment	Wellington Pump Station Wet Well <ul style="list-style-type: none">36 in. Inlet Pipe – Sanitary Sewage5 x 8 in. Outlets via pumps (wet well currently has 3 pumps) – Sanitary sewage Chase River Pump Station Wet Well <ul style="list-style-type: none">42 in. Inlet Pipe – Sanitary Sewage7 x 8 in. Outlets via pumps – Sanitary Sewage	<ul style="list-style-type: none">Ensure inlet, sluice gates and outlet plug valves are certified by a Professional Engineer.Chase River - 20 in. Overflow bypass – must be certified by a Professional Engineer.Chase River - 8 in. Force main drain – must be certified by a Professional Engineer.Follow written isolation/lockout proceduresAlternate Isolation Measure Approval (9.22) required from WSBC
Hazardous Energy	<ul style="list-style-type: none">PumpsSensors	<ul style="list-style-type: none">De-energize and lockout pumps.At Chase River Pump Station one pump must be left in standby mode. This is due to the sensitivity of the area overflowing to the river and the limited shutdown duration. This will allow the pump to be turned on immediately as the entrant exits the space.Explain to workers which pump is in standby mode and tag out at HMI Panel. Ensure there is a communication strategy in place and a procedure prior to entering the space.Follow written de-energization/lockout procedures

GENERAL HAZARD CONTROLS OF THE SPACE

Control Measure	Requirements
Entry Permit Required?	YES <ul style="list-style-type: none">Complete entry permit and have the Responsible Supervisor authorize before entry into the space.Complete entry log.
Atmospheric Monitoring	<ul style="list-style-type: none">4 – Gas monitoring (O₂, LEL, CO, H₂S) prior to ventilation, prior to entry and continuously while an entrant(s) is in the space.Carbon Monoxide sensor will be used to identify the presence of products of combustion.
Ventilation	Positive Pressure Ventilation <ul style="list-style-type: none">Ensure the exhaust system for the pump station is on for the duration of time inside the station/wet well Positive Pressure Ventilation of Pump Station Bottom (Area above Wet Well) <p>This measure is needed to ensure to provide effective ventilation to a worker inside the wet well.</p> <ul style="list-style-type: none">Use a 5000 CFM fan to provide ventilation to the bottom of the pump station, the lid area of the wet well.Draw air in from outside of the pump station, ensuring it is coming from a clean source. Ensure the exhaust from the pump station does not encroach on the intake of the ventilation fan.Ensure vehicles/small equipment do not idle/run within 25 ft. of space or intake of ventilation fan.



CONFINED SPACE ENTRY PROCEDURE

EXAMPLE ONLY

Date: May 22, 2019

Revision: July 14, 2020

Space: Wellington and Chase River

Location: Wellington – 5200 Fillinger Cres. Nanaimo, BC

Pump Stations, Wet Wells at Bottom

Chase River - 1174 Island Highway South, Nanaimo

Task(s): Inspection/ Wash Well Area and Remove grit with vacuum truck

	<ul style="list-style-type: none">Use an exhaust extension on vacuum truck to direct exhaust away from the site, as required.Ensure the duct of the 5000 CFM fan extends within 24 inches of the lid of the wet well.Ensure that the duct is located opposite to the exhaust system for the pump station and within 24 inches of the floor, the lid area of the wet well. <p>Positive Pressure Ventilation of Pump Station Bottom (Wet Well Itself)</p> <ul style="list-style-type: none">Ventilate the wet well with 900 CFM (volume of air at the end of the duct), blowing into the space for 15 minutes prior to entry and continuously while an entrant is in the space. This will provide 20+ air exchanges per hour.Ensure the fan is rated for at least twice the prescribed ventilation rate when using a ≤ 25 ft. duct (confirm with manufacturer's instructions that fan will provide required ventilation).Ensure the intake of the fan for the wet wells is near the outlet, the end of the poly duct, of the bigger fan.At a minimum the end of the duct must be suspended no more than 24" above the bottom of the wet well and is within 10 ft. of the worker. Move the duct as required during completion of work activities.
Standby Person	MODERATE Hazard Space - Standby person is to be stationed at or near the access and check on the well-being of the entrant regularly (at least every 20 minutes)
Hazardous Energy	<ul style="list-style-type: none">PumpsSensors <p>Wellington Pump Station Wet Well</p> <ul style="list-style-type: none">36 in. Inlet Pipe – Sanitary Sewage5 x 8 in. Outlets via pumps (wet well currently has 3 pumps) – Sanitary sewage12 in. force main – Fed by Outlets via pumps4 in. Inlet – Drain – Wash Down By-Pass Pipe3 in. Inlet – Drain – From the MCC Floor and Wet Well Platform Drain. <p>Chase River Pump Station Wet Well</p> <ul style="list-style-type: none">42 in. Inlet Pipe – Sanitary Sewage7 x 8 in. Outlets via pumps – Sanitary Sewage4 in. Sani-Truck Dump Inlet (indirectly flows into Wet Well) – Sanitary Sewage20 in. Overflow bypass8 in. Force main drain line #1 and #2
Rescue	A Rescue Plan that allows for a: <ul style="list-style-type: none">ENTRY Rescue (A rescuer is required to enter the space to assist an entrant to exit the space)

HAZARDS AND CONTROLS OF SPECIFIC TASK(S) (Not already identified)

GENERAL ENTRY PPE <i>(To be worn unless otherwise specified below)</i>	<ul style="list-style-type: none">• Tyvek, Rubber CSA Safety Toe Boots, Hard Hat, Nitrile and Work Gloves and Safety Glasses, Full-face respirator with P100/OV/AG cartridges.<ul style="list-style-type: none">○ Inspection – ONCE CLEANED – Coveralls, Rubber CSA Safety Toe Boots, Hard Hat, Nitrile and Work Gloves and Safety Glasses•	
TASK	HAZARD	CONTROL(S)



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Pump Stations, Wet Wells at Bottom

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Chase River - 1174 Island Highway South, Nanaimo

Task(s): Inspection/ Wash Well Area and Remove grit with vacuum truck

Work Position (Ergonomics)	Soft tissue injuries – manual lifting and awkward postures.	<ol style="list-style-type: none">1. Keep elbows by beltline (don't over reach).2. Keep load as close to the body as possible.3. Maintain a stable footing and base of support.4. Ask for help when needed.5. Take mini-breaks & stretch as needed.
Zip Cutting/Grinding Mild Steel (no coatings)	<ul style="list-style-type: none">○ Carbon Steel contains iron, chromium and nickel primarily. Grinding and cutting will produce fume with oxides and particulate which are skin, eye, and respiratory irritants. They can all produce Metal Fume Fever (flu like symptoms with sweet/ metallic taste in mouth) and are carcinogens over long periods of exposure.○ Carbon monoxide from zip cutting, grinding and welding○ Sparks○ Hot surfaces, flying projectiles, disc failure	<p>General:</p> <ul style="list-style-type: none">○ To be completed after the space is washed and ventilated.○ Keep combustibles out of the space○ Have a fire extinguisher readily available○ Ensure guard is in place and the RPM of the grinding/cutting wheel matches that of the tool <p>PPE:</p> <ul style="list-style-type: none">○ Entrant must change into/wear coveralls that are FR/Cotton, wear safety glasses with side shields, face shield, work gloves and half face respirator with P100 cartridges.
Welding to Repair Pipes (Welding a patch onto uncoated carbon steel) - SMAW	<ul style="list-style-type: none">○ Carbon Steel contains iron, chromium and nickel primarily. Grinding and cutting will produce fume with oxides and particulate which are skin, eye, and respiratory irritants. They can all produce Metal Fume Fever (flu like symptoms with sweet/ metallic taste in mouth) and are carcinogens over long periods of exposure.○ Carbon monoxide from zip cutting, grinding and welding○ Sparks○ Hot surfaces, flying projectiles, disc failure○ Electric shock	<p>General:</p> <ul style="list-style-type: none">○ To be completed after the space is washed and ventilated.○ Keep combustibles out of the space○ Have a fire extinguisher readily available○ Ensure Welding equipment is used as per manufacturer's directions and training.○ Welding requires localized exhaust control, either a smoke eater or a localized exhaust fan <p>PPE:</p> <ul style="list-style-type: none">○ Entrant must change into/wear coveralls that are FR/Cotton, wear welding shield, leather gauntlet gloves, half face respirator with P100/OV cartridges and hearing protection.
Pipe Fitting/Replacing Pump Bases – Drilling Concrete (To mount/remount pipes)	<ul style="list-style-type: none">○ Wet Well constructed of concrete which when mechanically disturbed will release silica, a known carcinogen (i.e. drilled, ground, cut).	<p>General:</p> <ul style="list-style-type: none">○ If drilling of concrete is required, use wet methods or a HEPA attachment <p>PPE:</p> <ul style="list-style-type: none">○ Entrant must change into/wear coveralls, wear safety glasses with side shields, work gloves and half face respirator with P100 cartridges.



CONFINED SPACE ENTRY PROCEDURE

EXAMPLE ONLY

Date: May 22, 2019

Revision: July 14, 2020

Space: Wellington and Chase River
Pump Stations, Wet Wells at Bottom

Location: Wellington – 5200 Fillinger Cres. Nanaimo, BC
Chase River - 1174 Island Highway South, Nanaimo

Task(s): Inspection/ Wash Well Area and Remove grit with vacuum truck

3. Equipment Required

GENERAL CONFINED SPACE ENTRY EQUIPMENT (REFERENCE SAFE WORK PROCEDURES FOR OTHER REQUIRED EQUIPMENT)		
<input type="checkbox"/> 4 Gas Detector (O ₂ , CO, H ₂ S, LEL) <input type="checkbox"/> Ventilation Fan – 5000 CFM (Fan rating) with appropriate duct for reaching within 24 inches of the pump station floor, the lid area of the wet well. <input type="checkbox"/> Ventilation Fan and duct (min. 900 CFM at end of duct required) <input type="checkbox"/> Portable Ladder	<input type="checkbox"/> Communication Equipment (RADIO, CELL PHONE) <input type="checkbox"/> Tripod/Davit Arm <input type="checkbox"/> Self-Retracting Lifeline with Winch <input type="checkbox"/> Temporary Fall Protection Guarding <input type="checkbox"/> Lockout Kit/Equipment <input type="checkbox"/> GFCI for Electrical Equipment	<input type="checkbox"/> Bucket and Rope <input type="checkbox"/> Level 1 First Aid Kit <input type="checkbox"/> Eye Wash Station <input type="checkbox"/> Additional Rescue Equipment (See Rescue Plan) <input type="checkbox"/> OTHER EQUIPMENT AS IDENTIFIED IN APPLICABLE PROCEDURES/ DOCUMENTATION
PERSONAL PROTECTIVE EQUIPMENT (REQUIRED LIST - FOR GENERAL ENTRY AND TASKS)		
<input type="checkbox"/> FR Coveralls <input type="checkbox"/> Tyvek Coveralls <input type="checkbox"/> CSA Safety Toed Rubber Boots <input type="checkbox"/> Hard Hat <input type="checkbox"/> Gloves (NITRILE/WORK)	<input type="checkbox"/> Eye Protection (SAFETY GLASSES/FACE SHIELD/FULL-FACE RESPIRATOR) <input type="checkbox"/> Respiratory Protection (FULL and ½ FACE RESPIRATOR with P100/OV/AG CARTRIDGES)	<input type="checkbox"/> Hearing Protection <input type="checkbox"/> Harness <input type="checkbox"/> Auxiliary Light Source

4. Entry Procedure

Topic	#	Procedure	Reminders
Entry Log/Permit	1.	Complete and post Confined Space Entry Permit	<i>Ensure all fields are completed.</i> <i>Permits require supervisors written authorization.</i>
Tailboard	2.	Supervisor Conduct a tailboard meeting which includes: <ul style="list-style-type: none">• Assignment of roles and responsibilities (Responsible Supervisor, Standby, Entry and Rescue) Review Documentation: <ul style="list-style-type: none">• CS Hazard Assessment• CS Entry procedure• CS Rescue Plan• Lockout and Isolation procedures,• Specific work procedures,• WSBC Alternate Isolation Measures Acceptance (WSBC 9.22)• Professional Engineer Certification of Isolation Points• Written Rescue Agreement• Other applicable documentation	<i>Record assignees of roles and responsibilities, meeting attendees and that all necessary documents have been reviewed.</i>
Standby	3.	Supervisor to assign a competent and responsible standby person.	<i>Record name of person assigned the role of Standby Person.</i>



CONFINED SPACE ENTRY PROCEDURE

EXAMPLE ONLY

Date: May 22, 2019

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Space: Wellington and Chase River
Pump Stations, Wet Wells at Bottom

Location: Wellington – 5200 Fillinger Cres. Nanaimo, BC
Chase River - 1174 Island Highway South, Nanaimo

Task(s): Inspection/ Wash Well Area and Remove grit with vacuum truck

Topic	#	Procedure	Reminders
		<p>Moderate Hazard Space:</p> <ul style="list-style-type: none"> Standby person is to be stationed at or near the access Confirm effective and continuous means to communicate with entrant. Maintain continuous visual contact of entrant. Confirm effective means to summon additional help should it be required Check on the well-being of the entrant(s) regularly (at least every 20 minutes) Ensure that the required controls remain in place and continue to be effective (i.e. intake of fan) Ensure the end of the duct is within 10 ft. of the entrant. Ensure continuous effective communication between the entrant, standby person and vacuum truck operator 	<p>The standby person cannot enter the space for <u>any</u> reason.</p>
Rescue Plan	4.	<ul style="list-style-type: none"> Reconfirm assignment of Rescue Roles and Responsibilities Review how the rescue will be initiated and how the entrant will be rescued Note any restrictions to the work process that may be required based on planned method of rescue 	<p>Record names of persons assigned rescue duties.</p> <p>Review Rescue Plan.</p> <p>Ensure equipment is SET-UP and "Ready to Go!"</p>
Communication	5.	<p>Standby Person to check method of communication to confirm effective between,</p> <ul style="list-style-type: none"> Entrant and Standby Person Standby Person and Rescue Resources Standby Person and Emergency Services (911) 	<p>During initial entry into the confined space, test communications to ensure there are no unexpected "Dead Spots."</p>
Establish Safe Work Zone/ Traffic Control	6.	<ul style="list-style-type: none"> Establish site safe work zone Establish a staging area, Keep tools/equipment/supplies not in use at least 3 feet away from access. 	
Lockout – Energy/ Isolation	7.	<p>Energy Sources</p> <ul style="list-style-type: none"> Pumps Follow written lockout procedure <p>Isolation</p> <p>Wellington Pump Station Wet Well</p> <ul style="list-style-type: none"> 36 in. Inlet Pipe – Sanitary Sewage – Close and lockout sluice gate. 12 in. force main isolation valve 3 x 8 in. Outlets via pumps – Close and lockout plug valves 4 in. Inlet – Drain – Wash Down By-Pass Pipe – Close and lockout plug valve 	<p>Spaces requiring lock-out/ isolation require a permit.</p> <p>Hazardous Energy Sources require <u>written</u> lockout/isolation procedures to be on site.</p> <p>Ensure all associated documentation is on site, if required (PEng. Certification, Alternate Measure Acceptance).</p>



CONFINED SPACE ENTRY PROCEDURE

EXAMPLE ONLY

Date: May 22, 2019

Revision: July 14, 2020

Space: Wellington and Chase River

Location: Wellington – 5200 Fillinger Cres. Nanaimo, BC

Pump Stations, Wet Wells at Bottom

Chase River - 1174 Island Highway South, Nanaimo

Task(s): Inspection/ Wash Well Area and Remove grit with vacuum truck

Topic	#	Procedure	Reminders		
		<p>Chase Pump Station Wet Well</p> <ul style="list-style-type: none"> 42 in. Inlet Pipe – Sanitary Sewage – Close and lockout sluice gate. 7 x 8 in. Outlets via pumps – Close and lockout plug and air actuated valves. 4 in. Sani-Truck Dump Inlet - Cap, lock Sani-Truck Inlet to Wet well. Also notify collection companies, post signage and erect barriers around dumping bay. 20 in. Overflow bypass – Close and lockout bypass valve to wet well 8 in. Force main drain – Isolate with inflatable plug. <p>For BOTH Wet Wells</p> <ul style="list-style-type: none"> Follow written isolation/lockout procedures Alternate Isolation Measure Approval (9.22) required from WSBC <p>De-energization and Lockout of some or all of the points may have to occur after emptying, cleaning the space.</p>			
Check Gas Detector	8.	<p>Outside the space,</p> <ul style="list-style-type: none"> Turn on and check battery and function of the gas detector(s). Ensure detector(s) is calibrated as per the manufacturer's instructions. Ensure detector(s) has been zeroed and a bump test has been completed within the last 24 hours. Clear the peaks before use. 	Recommended Alarm Set Points	LOW Alarm	HIGH Alarm
			O ₂	20.5%	22.0%
			LEL	5%	10%
			CO	10 ppm	25 ppm
			H ₂ S	5 ppm	10 ppm
Open Access	9.	<ul style="list-style-type: none"> Test around the access point with the gas detector before and while opening it. Open access. Remain aware of your position in relation to the access, while opening (i.e. open from hinge side, take a knee, etc.) Secure hatch in open position, as required. Use fall protection around open hatches when there is sewage/liquid still in the wet well. 			
Emptying/ Cleaning of Space	10.	<ul style="list-style-type: none"> Wash as much of the space from the deck level without entering as possible. The majority of remaining material will be grit with minimal organic content. If grit is to be removed, remove as much grit as possible without entering the space. Organic/Sanitary sewer debris that cannot be removed by washing from the outside must at least be disturbed and disturb the remaining grit as much as possible from outside of the space BEFORE ventilation and entry. 	<p><i>While washing note any locations where residue may be left and make sure entrant is aware.</i></p>		



CONFINED SPACE ENTRY PROCEDURE

EXAMPLE ONLY

Date: May 22, 2019

Revision: July 14, 2020

Space: Wellington and Chase River

Location: Wellington – 5200 Fillinger Cres. Nanaimo, BC

Pump Stations, Wet Wells at Bottom

Chase River - 1174 Island Highway South, Nanaimo

Task(s): Inspection/ Wash Well Area and Remove grit with vacuum truck

Topic	#	Procedure	Reminders		
		<ul style="list-style-type: none">Allow pumps to run while washing space from the outside to flush outlets and allow water to remain in outlet pipes rather than sanitary sewage.			
Test Atmosphere for Initial Conditions	11.	<ul style="list-style-type: none">Thoroughly test the atmosphere in the space <u>before</u> ventilation. If the levels exceed the maximum permissible levels listed to the right, an unexpected hazard is present. <p>STOP → DO NOT ENTER → CONTACT YOUR SUPERVISOR.</p>	Maximum Permissible Levels Prior to Ventilation		
			O ₂	19.5% (min)	22% (max)
			LEL	10 %	
			CO	0 ppm	
			H ₂ S	10 ppm	
Mechanically Ventilate Space (Wet Well)	12.	<p><u>Positive Pressure Ventilation of Pump Station Bottom (Wet Well Itself)</u></p> <ul style="list-style-type: none">Follow manufactures directions in regard to setting up fan to ensure correct volume of air is being delivered to the space (i.e. duct length, number of bends, etc).Ventilate the wet well with 900 CFM (volume of air at the end of the duct), blowing into the space for 15 minutes prior to entry and continuously while an entrant is in the space. This will provide 20+ air exchanges per hour.Ensure the fan is rated for at least twice the prescribed ventilation rate when using a ≤ 25 ft. duct (confirm with manufacturer’s instructions that fan will provide required ventilation).Ensure the intake of the fan for the wet wells is near the outlet, the end of the poly duct, of the bigger fan.At a minimum the end of the duct must be suspended no more than 24” above the bottom of the wet well and is within 10 ft. of the worker. Move the duct as required during completion of work activities.	<p><i>Ensure contaminants are not introduced to space or ventilation fan intake.</i></p> <p><i>If mechanical ventilation fails at any time during entry, the space must be vacated immediately.</i></p>		
Re-Test Atmosphere	13.	<ul style="list-style-type: none">Re-test the air inside the space after ventilating for 15 minutes. Air monitoring must read equivalent or better than “Clean Respirable Air” levels. <p>Clean Respirable Air (CRA) is:</p> <p>Oxygen (O2) = ~ 20.9 % (20.8 to 21%)</p> <p>Combustibles (LEL) = 0%</p> <p>Carbon Monoxide, CO = ≤ 2 ppm</p> <p>Hydrogen Sulfide, H₂S = ≤ 1 ppm</p> <p>If the atmosphere does not contain CRA, workers are not allowed to enter.</p> <p>STOP → DO NOT ENTER → CONTACT YOUR SUPERVISOR.</p>	<p><i>Typically, when air is not clean after ventilation, there are a couple possibilities:</i></p> <ol style="list-style-type: none"><i>1) Contaminants generated are different than what was assessed.</i><i>2) Ventilation is not pushing/pulling the amount of air required at the end of the duct. Recheck ventilation system for bends in duct,</i>		



CONFINED SPACE ENTRY PROCEDURE

EXAMPLE ONLY

Date: May 22, 2019

Revision: July 14, 2020

Space: Wellington and Chase River
Pump Stations, Wet Wells at Bottom

Location: Wellington – 5200 Fillinger Cres. Nanaimo, BC
Chase River - 1174 Island Highway South, Nanaimo

Task(s): Inspection/ Wash Well Area and Remove grit with vacuum truck

Topic	#	Procedure	Reminders
			<i>faulty fan, joints not connected properly.</i>
Don PPE/Specific Instructions	14.	Don Personal Protective Equipment required for entry and the assigned task(s) being completed.	
		Specific Instructions (other than PPE) <ul style="list-style-type: none">All electrical equipment to be fitted with a GFCI	
Fall Protection/Lifeline	15.	<ul style="list-style-type: none">Entrant to be connected to a self-retracting lifeline with winch while using the ladder to enter/exit the space.Workers are to use a fall protection system when working near open hatches while there is sewage/liquid in the wet well.Once the wet well is drained, pumped out, fall protection is not required.	<i>Standby must assist in managing the lifeline/fall protection system to ensure that it does not become entangled.</i>
Access – Specific Instructions	16.	<ul style="list-style-type: none">Confirm hatch is secured in the open position, if applicable.Confirm entrant is securely attached to the self-retracting lifeline.If using a portable ladder, ensure it extends 3 rungs beyond the access and is secured in place.While using a fixed ladder, confirm integrity of each rung before fully committing weight.Maintain 3-point contact while entering the space and using ladder.	
Enter to Perform Tasks	17.	<ul style="list-style-type: none">Enter the space and carry out the planned task(s).Monitor the atmosphere on a continuous basis while entrants are inside the space.The focus of atmospheric monitoring is the entrant's breathing zone.Remember to periodically check the peaks on the gas monitor.The ventilation duct is to be moved during the completion of tasks so that the end of the duct remains within 10 ft. of the worker (the duct that is providing 900 CFM)Remain aware of slip/trip/snag hazards.Do not stand on equipment in the space (i.e. pumps)Remain aware and ensure stable footing when working in spaceWork in a way that the entrant can stand on the bottom of the space rather than on the grit, accumulated material.Lower tools/equipment using a bucket and not over entrant or using positive hand-off techniques.Do not stand below live loads.	<p><i>Entrant(s) name and entry time recorded on Entry Log/Permit.</i></p> <p><i>Remain aware of changes in the monitor readings, even those that do not cause the monitor to alarm (Check PEAKS).</i></p> <p><i>If the monitor alarms, the entrant must identify why and if the reason is not immediately identifiable, the entrant must exit the space. Re-entry will be authorized only when the entrant's supervisor has determined that any identified issue has been adequately addressed.</i></p>



CONFINED SPACE ENTRY PROCEDURE

EXAMPLE ONLY

Date: May 22, 2019

Revision: July 14, 2020

Space: Wellington and Chase River
Pump Stations, Wet Wells at Bottom

Location: Wellington – 5200 Fillinger Cres. Nanaimo, BC
Chase River - 1174 Island Highway South, Nanaimo

Task(s): Inspection/ Wash Well Area and Remove grit with vacuum truck

Topic	#	Procedure	Reminders
		<ul style="list-style-type: none">Entrant must maintain visual contact to end of the vacuum truck hose and keep end directed away from him/her.Ensure continuous effective communication between the entrant, standby person and vacuum truck operator	<p><i>In the event of a ventilation and/or respiratory equipment failure, exit the space immediately.</i></p> <p><i>If the work activity may affect the rescue plan in any way, STOP and the impact must be discussed and if required, additional resources added.</i></p>
Re-entry – Atmospheric Testing	18.	Pre-entry testing must be repeated, and results recorded if: <ul style="list-style-type: none">The space is vacated for more than 20 minutes; orVentilation is interrupted; orSpace is out of sight at any time.	Record this information on your Entry Log/Permit.
Post Entry	19.	<ul style="list-style-type: none">Wash with soap and water after exiting the space.Inspect all equipment prior to re-storing. If any equipment damaged, burned or frayed, it must be immediately fixed or replaced prior to restoring.Confined space Entry Permits are to be retained for a minimum of one year from date of entry.	

Additional Information

For further information regarding confined space entry requirements, refer to WorkSafe BC OH&S Regulation Part 9 & Part 4 (rescue).

Completed By: Jason Hindson, CRSP
Qualified Person(s)

Reviewed By: Rob Skwarczynski
Chief Operator

Zach Suhan
JHSC Representative

*Orca Health & Safety Consulting
Inc.*

Date: May 25, 2019

WPS Isolation Plan

Step #	What to do
1	Close 36" influent isolation gate valve
2	Pump down the wet well
3	Lockout 3 pumps
4	Close and lockout the 12" force main isolation plug valve
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
Notes:	

EXAMPLE ONLY

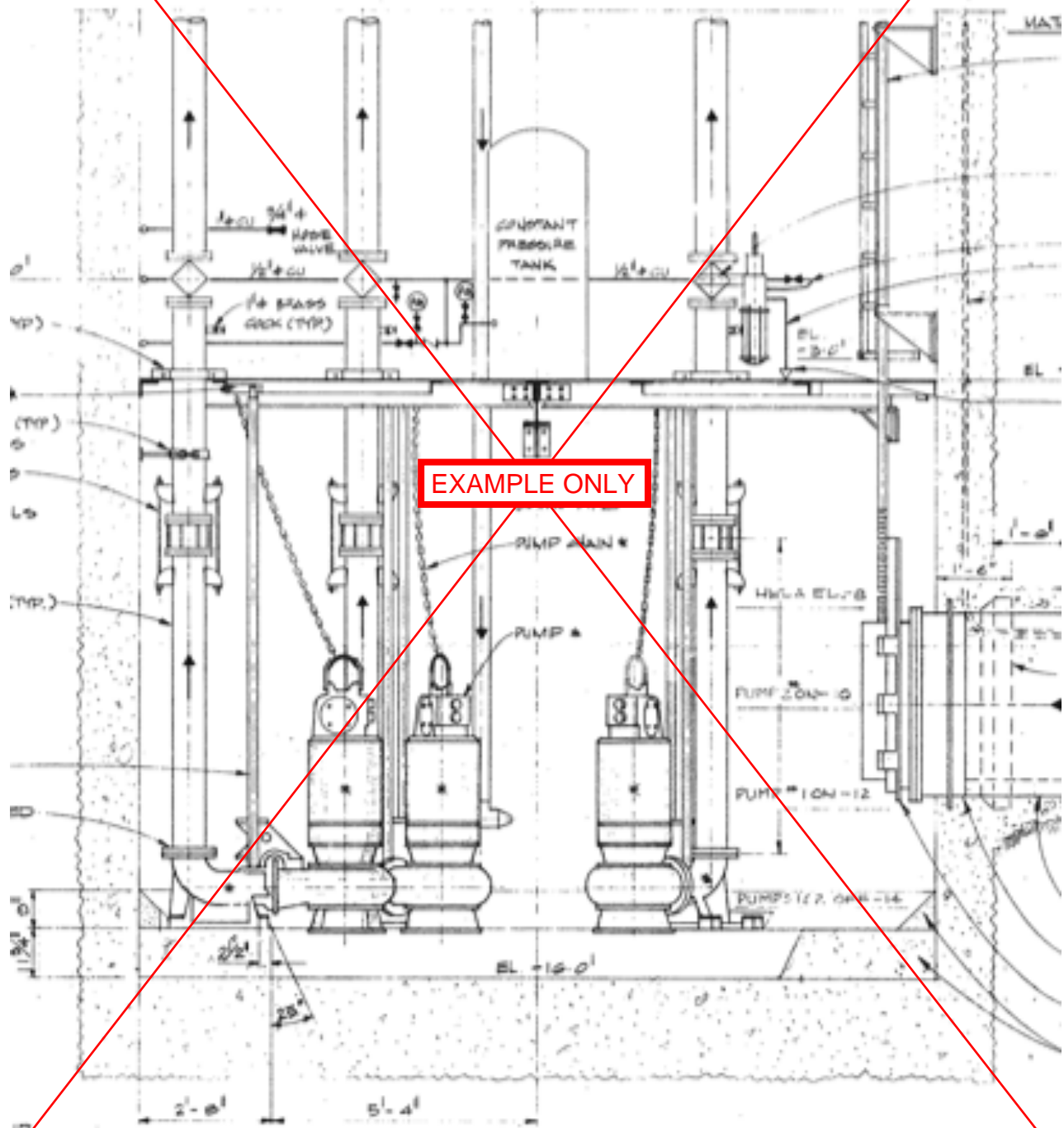
CRPS Isolation Plan

EXAMPLE ONLY

Step #	What to do
1	Lock out 4 out of 5 pumps (put remainder in standby mode)
2	Lock out 6 out of 7 isolation valves
3	Pig 8" Force main drain line to wet well
4	Ensure the wet well influent bypass valve is closed
5	Close the 42" influent gate to the station
6	Pump down the wet well using the unlocked pump
7	Post do not operate tags on the HMI and leave 1 valve and 1 pump in standby for emergency
8	Monitor influent chamber level during the confined space entry
9	
10	
11	
12	
13	
14	
15	
16	
Notes:	

DIAGRAM 1

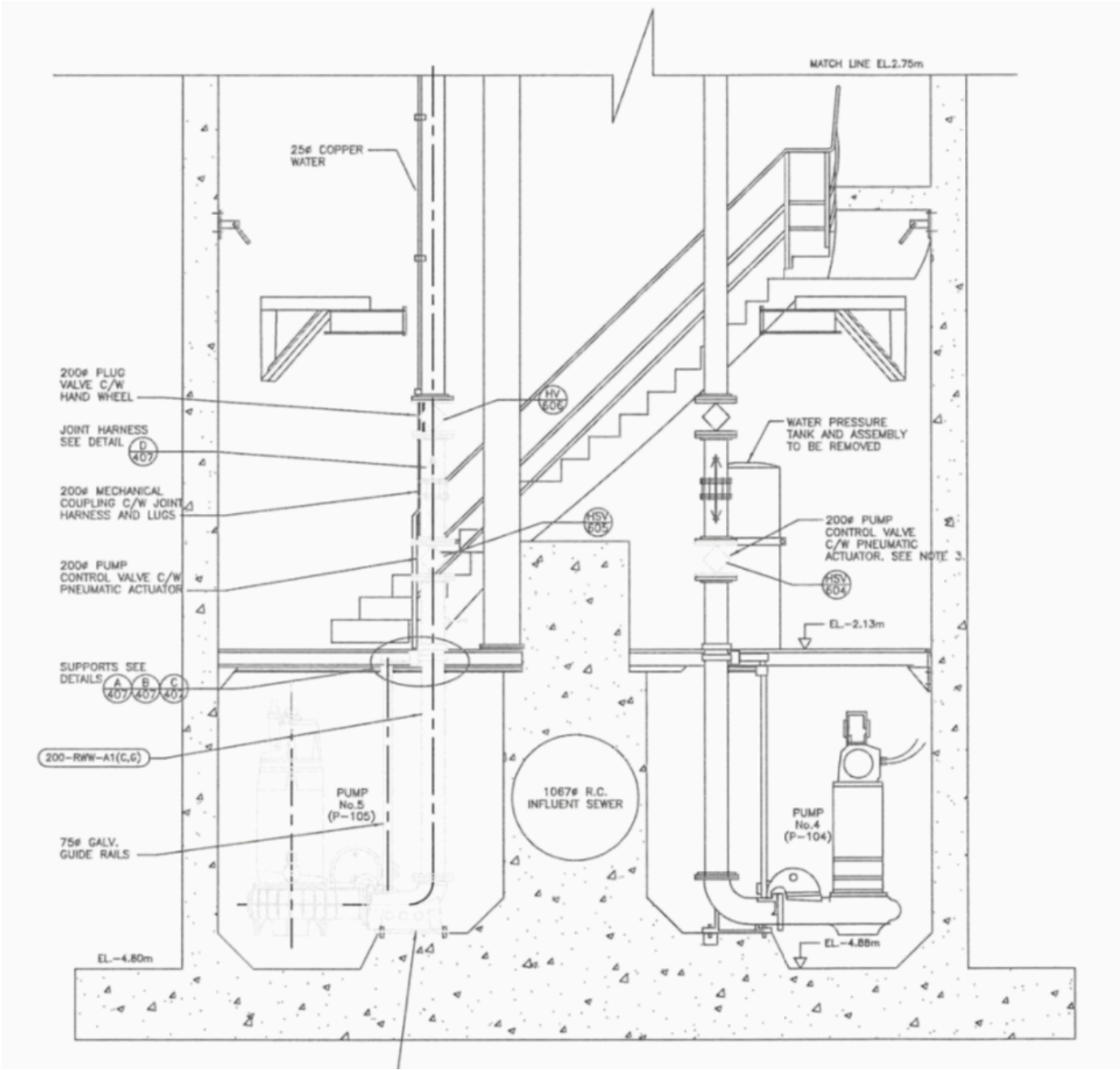
Side Profile of Wellington Wet Well/Pump Station



EXAMPLE ONLY

DIAGRAM 2 –

Side Profile of Chase River Wet Well/Pump Station



CONFINED SPACE RESCUE PLAN



Spaces Requiring an ENTRY Rescue
LOW/MODERATE HAZARD CONFINED SPACE

Date: **March 23, 2017**

Revised: **March 18, 2018**

EXAMPLE ONLY

Location: **Spaces that are part of the Regional District of Nanaimo Sewer Collection System**

SCOPE: This Confined Space Rescue Plan is **ENTRY/INTERNAL** rescue into a **LOW/MODERATE** hazard atmosphere. It is for entries where the entrant will be connected to a self-retracting lifeline with a winch for ENTRY and EXIT only. During the entry and completion of tasks, the entrant will **NOT** remain connected to a lifeline and/or below the access point and obstacles, that may hinder the rescue, could be introduced. There is a written RESCUE SERVICES AGREEMENT with the City of Nanaimo Fire Department. It is the responsibility of the CS Supervisor to ensure "effective" rescue services are available. The rescue team must be trained, this plan reviewed before each entry and practiced/drilled at least annually.

APPLICABLE SPACES:

Spaces through-out the Regional District of Nanaimo's Sewer Collection System located in areas that fall under the jurisdiction of the Nanaimo Fire Department. These are entries where an entrant will not/cannot remain connected to an external retrieval/rescue means.

RESCUE PLAN OVERVIEW

- Upon initiation of a rescue, all other on-site confined spaces will be immediately evacuated.
- The first goal of the Rescue Team is to aid the injured entrant's self-rescue attempt.
- Although the planned method of rescue is an **ENTRY/INTERNAL** one, a non-entry/external rescue will be attempted using the entrant's lifeline if possible and if any self-rescue attempt fails or is not possible.
- If an ENTRY/INTERNAL rescue is required, the Nanaimo Fire Department will be notified and requested to respond as per the Rescue Services Agreement.
- The equipment identified in this plan is only to allow for safe entry/exit from the space and to allow a NON-ENTRY/EXTERNAL rescue should it be possible.

Possible/Expected Injuries Medical, Bruises/Sprains (from slips and trips)

ROLES AND RESPONSIBILITIES FOR RESCUE (Note assignment(s) on entry log/permit)

Minimum Number of Personnel
Required for Rescue:

1

Role	Responsibility
Rescue Leader/ Standby Person/ Rescuer/ First Aid	<p>A single person that will fill all roles:</p> <ul style="list-style-type: none"> Directs and coordinates initial rescue efforts at the site/assists the Fire Department (FD) as directed until the injured entrant is safely out of the space and handed over to emergency services. Communicates with entry personnel, summons and assists with rescue efforts, keeps records of all confined space entrants and atmospheric readings, ensures controls remain effective and orders evacuation, if necessary. Assists entrant in exiting the space if self-rescue is possible or a NON-ENTRY/EXTERNAL rescue, if possible during entry/exit from the space. Must be trained in first aid (Another person in the plant can fill this role)

RESCUE SYSTEM	Rescue Method	<input type="checkbox"/> External Manual Retrieval (NON-ENTRY RESCUE)	<input checked="" type="checkbox"/> Internal Manual Retrieval (ENTRY RESCUE)
	Rescue System	<input type="checkbox"/> Horizontal System	<input checked="" type="checkbox"/> Vertical System <input type="checkbox"/> Combination Horz/Vert System
	Pre-Rigging Required?	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	Notes: Self-Retracting Lifeline to be used for entry/exit from the confined space. The FD is responsible for establishing and deploying any additional systems.
	Anchor Required?	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	Type: <input type="checkbox"/> Horizontal <input checked="" type="checkbox"/> Vertical (<10 ft) <input checked="" type="checkbox"/> Vertical (>10 ft) <small>Min 5000lbs.</small>
	Anchor to be used:	<input checked="" type="checkbox"/> Tripod/Davit Arm/Suitable anchor	

EQUIPMENT REQUIRED (In addition to that listed in the Entry Procedure)

Ensure all required equipment and personnel for the planned method of rescue are "Ready to Go!"

EQUIPMENT	General Equipment:	First Aid & Packaging Equipment:
	Gas Monitor (2 nd One Designated for Rescue Purposes)	2 First Aid Kit – OFA Level 1
	Communication Equipment (Radio/Cell)	1 Entrant's Harness (worn for entry)

CONFINED SPACE RESCUE PLAN



Spaces Requiring an ENTRY Rescue LOW/MODERATE HAZARD CONFINED SPACE

Date: **March 23, 2017**

Revised: **March 18, 2018**

EXAMPLE ONLY

Location: **Spaces that are part of the Regional District of Nanaimo Sewer Collection System**

Source of Light (as required)	1		
Lifeline/Rope Requirements and Rescue Rigging Equipment			
Tripod/Davit Arm/Suitable Anchor	1	Self-Retracting Lifeline with Winch	1
Rescue Team PPE – EACH ENTRY RESCUER (<i>Ensure additional PPE Requirements in CS Entry Procedure are met, as required</i>):			
Additional PPE is not required for an external rescuer other than that listed in the confined space hazard assessment/entry procedure for working while stationed at the access point. The FD is responsible for ensuring its personnel are appropriately protected from any hazards.			

PLANNING - Before Work Begins

PLANNING / SET-UP	CS SUPERVISOR reviews the Confined Space Hazard Assessment, Entry procedure, this Rescue Plan and ALL other applicable/required documentation.
	CS SUPERVISOR assesses the characteristics and hazards of the confined space , as well as the work to be completed and ensures this rescue plan is adequate and the required resources are available (equipment, PPE and personnel).
	Roles & Responsibilities – CS SUPERVISOR ensures rescue team roles and responsibilities are assigned to competent workers (Rescue Leader, Standby Person, Rescuer(s)/First Aid Attendant). (NOTE ON ENTRY LOG/PERMIT)
	Communication – Confirm planned methods of communication are effective between: <ul style="list-style-type: none"> Entrant & Standby Person – Voice Standby Person & Emergency Services – Cell Phone Standby Person & Rescue Team – Voice (will be located at the space) FD Rescue Team Members – As per Nanaimo Fire Department Standard Operating Practice
	Rescue Team/Equipment Location – The NON-ENTRY/EXTERNAL rescue team and equipment will be at the space. The ENTRY/INTERNAL rescue team (Nanaimo Fire Department) will be stationed off site and will respond once called.
	Restrictions for the Entry/Entrant(s) Work to ensure this rescue plan remains effective: <ul style="list-style-type: none"> The entrant must be connected to a self-retracting lifeline during entry/exit from the confined space.
	No further harm: Note if there are any objects upon which the injured entrant may become caught on during an external rescue attempt. This will be reconfirmed by a verbal/visual assessment at the time of rescue.
	RESCUE LEADER notes any additional hazards, controls, comments regarding the planned method of rescue in the comments section of the entry log/permit. (NOTE ON ENTRY LOG/PERMIT)
	Review Rescue Plan: In tailboard talk, the Rescue Leader explains how the rescue will be completed, discussing: <ul style="list-style-type: none"> Roles and Responsibilities How the rescue plan will be initiated, Rescue Team notified? How the injured entrant will be rescued (Method and System)? Restrictions to the entry/entrant(s) that may be required based on the planned method of rescue
	RESCUE LEADER ensures all required rescue equipment is set up BEFORE any worker enters the confined space.
If Lockout/Isolation is required, RESCUER(S) lockout BEFORE entry is made/work begins. A group lockout procedure must be used and the group lock box stationed with the standby worker.	

WHAT TO DO	Person Responsible	WHAT TO DO - On Initiation of Rescue
	STANDBY PERSON	In case of an emergency, work location will be: As identified on the ENTRY LOG/PERMIT
	STANDBY PERSON	Notifies/ summons the pre-determined rescue team members.
	RESCUE LEADER	Must consider “Why is rescue needed?” <ul style="list-style-type: none"> Assess the situation (ask entrant, if possible) and reassess all known hazards. Ensure the prescribed controls are still in place and effective (confirm atmosphere with monitor). Control any newly identified hazards and document in the comments section of the Confined Space Entry Log/Permit (note on entry log permit). Rescue Team Personnel safe (currently and to perform their role)?
	RESCUE LEADER	Call 911 and state it is a Confined Space Emergency and explain the nature of all known injuries, number

CONFINED SPACE RESCUE PLAN



Spaces Requiring an ENTRY Rescue LOW/MODERATE HAZARD CONFINED SPACE

Date: **March 23, 2017**

Revised: **March 18, 2018**

EXAMPLE ONLY

Location: **Spaces that are part of the Regional District of Nanaimo Sewer Collection System**

	of people involved, location of the confined space, any site access notes, and the on-site telephone number.
RESCUE LEADER	Self-Rescue attempts should be encouraged, if safe to do so and no further harm may result.
RESCUE LEADER	Determine if a NON-ENTRY/EXTERNAL RESCUE can safely be performed, including assistance from a fellow entrant <u>already</u> in the space. Confirm that the injured entrant will NOT become caught on any object and the possible injuries allow for this type of rescue.
ENTRANT	At the direction of the RESCUE LEADER , a fellow ENTRANT <u>already</u> in the space can assist an injured entrant in relocating to a position below the tripod/davit arm/suitable anchor.
RESCUER	At the direction of the RESCUE LEADER , switch the self-retracting lifeline to retrieval/winch mode and begin to raise the injured entrant. Ensure that he/she does NOT BECOME CAUGHT on any object and that the CABLE IS NOT allowed to RUB AGAINST any edge/object, protect if necessary.
RESCUER(S)/ FIRST AID	Once the injured entrant is outside of the space, move to a safe area, reassess and maintain medical responsibility until relieved by a higher level of care (i.e. Emergency Medical Personnel/On site designated First Aid Attendant)
FIRST AID	Once the injured entrant has retrieved from the space, assess the injured entrant and provide an update to the RESCUE LEADER . <ul style="list-style-type: none"> • Nature and Mechanism of Injury, • Level of Consciousness (Alert, Verbal, Pain, Unresponsive) • ABC – Airway, Breathing, Circulation • Rapid Body Survey
RESCUE LEADER	If an ENTRY/INTERNAL Rescue is required <u>only</u> trained and equipped FD Technical Rescue personnel may enter the space to perform a rescue. The FD will have their own Rescue Plan.
STANDBY PERSON	While waiting for the FD, reconfirm that the identified hazards are appropriately controlled and that there are no new hazards that need to be addressed. (i.e. Air Monitoring, Ventilation, Isolation/Lockout) <ul style="list-style-type: none"> ➤ CONFIRM ATMOSPHERE IS SAFE and continuously monitor.
RESCUE LEADER and RESCUE TEAM	Upon FD arrival, assists as per the request of the Incident Commander
RESCUE LEADER	Update the FD upon arrival: <ul style="list-style-type: none"> • How many entrants are in the space? • Injured entrant(s) location • Possibly Injuries and Mechanism <ul style="list-style-type: none"> • Hazards of the Space (Hazard Assessment) • Hazard Controls in place (Entry Procedure) • Gas Monitor Readings • Lockout Box Location (if applicable)
RESCUE LEADER	Workers requiring medical treatment are to be transported to the nearest Hospital or Medical Center as noted on the Confined Space Entry Log/Permit (Injured/rescued entrants must not transport themselves to seek medical attention).
RESCUE LEADER	Inform the CS SUPERVISOR when the rescue operation is completed, secure the scene and await further direction.

Completed by:

Jason Hindson, CRSP

Reviewed by:

Robert Skwarczynski

Zach Suhan

Qualified Person(s)

Chief Operator - GNPCC

JHSC Representative



Orca Health and Safety Consulting
Inc.

Date: March 23, 2017

EXAMPLE ONLY

The *Workers Compensation Act* requires that the employer must post a copy of this report in a conspicuous place at or near the workplace inspected for at least seven days, or until compliance has been achieved, whichever is the longer period. A copy of this report must also be given to the joint committee or worker health and safety representative, as applicable.

A revised version of the *Workers Compensation Act* took effect on April 6, 2020. The B.C. government's revisions aim to make the Act easier to read and understand, and to reorganize the numbering to make laws easier to find. The revisions make no changes to B.C.'s laws concerning workers' compensation, occupational health and safety, and employers' assessment premiums. Please be aware there may be a transitional period where correspondence from WorkSafeBC may include references to either the previous Act or the revised Act. For more information, visit www.worksafebc.com/WCA2019 or call the Prevention Information Line at 604.276.3100, or toll free within BC at 1.888.621.7233 (SAFE).

Inspection Report #202016686096A

Employer Name	Jobsite Inspected	Scope of Inspection
REGIONAL DISTRICT OF NANAIMO	6300 Hammond Bay Road Nanaimo BC V9T 6N2	Wellington and Chase River Pump Station Wet Wells

Date of Initiating Inspection	Date of This Inspection	Delivery Date of This Report	Delivery Method
Aug 13, 2020	Aug 13, 2020	Aug 13, 2020	Email

THERE ARE ZERO (0) ORDERS OR OTHER ITEMS OUTSTANDING

**ACTION MAY STILL BE NECESSARY TO ENSURE COMPLIANCE
PLEASE READ FULL REPORT**

INSPECTION NOTES

Application for acceptance

The employer has requested that WorkSafeBC accept alternate measures under section 9.22 of the Occupational Health and Safety Regulation. The employer has provided the following documents to support its request:

- * Letter dated July 13, 2020 Re: Application for Acceptance of Alternate Isolation Measures for Confined Space Entry - Wellington and Chase River Pump Station Wet Wells.
- * Letter dated July 13, 2020 Re: Regional District of Nanaimo - Greater Nanaimo Water Pollution Treatment Centre JHSC Consultation of the Application for "Acceptance of Alternate Isolation Measures for Confined Space Entry into Wellington and Chase River Pump Station Wet Wells"
- * Confined Space Entry Procedure for Wellington and Chase River Pump Stations Wet Wells at Bottom dated May 22, 2019 (revised: July 14, 2020)
- * Confined Space Hazard Assessment for Wellington and Chase River Pump Stations Wet Wells at Bottom dated May 4, 2019 (revised: July 14, 2020)
- * Letter dated May 24, 2011 Re: Agreement for Confined Space Rescue Services
- * Confined Space Rescue Plan dated March 23, 2017 (Revised: March 18, 2018)
- * Diagram 1 Side Profile of Wellington Wet Well / Pump Station
- * Diagram 2 Side Profile of Chase River Wet Well / Pump Station
- * CRPS Isolation Plan
- * WPS Isolation Plan
- * IR201916961065A

Two wet wells similar in design and operation, one located at 5200 Fillinger Cres and the other at 1174 Island Hwy S in Nanaimo, are to be accessed by workers. The purpose of entry was reported to be for:

- Inspection
- Wash Well Area
- Remove grit with vacuum truck (as required, based on an on-site assessment)
- Pipe fitting/Replacing Pump Bases (Anchoring Pipes – Drilling Concrete)
- Cutting and grinding as needed with a zip cutter/grinder
- Welding to Repair Pipes (Welding a patch onto uncoated carbon steel) - SMAW

In accordance with OHS Guideline G9.22-2, a Prevention Officer may make the decision on behalf of WorkSafeBC in this case.

Decision

The acceptance is granted to the employer, Regional District of Nanaimo Firm No. 138613, who has responsibility to ensure that the terms of this acceptance are complied with. The acceptance is only applicable to the wet well/pump station at 5200 Fillinger Cres, Nanaimo and 1174 Island Hwy S, Nanaimo. If the location of the worksite changes or if the acceptance granted to one jobsite is to be applied to another jobsite, the employer must apply for another acceptance.

Special Terms

The conditions and procedures set out in the above-noted documents must be complied with as well as the following:

- * All requirements of the Workers Compensation Act and the Occupational Health and Safety Regulation must be followed.
- * All procedures as provided in the documentation must be followed and where inconsistencies occur, the higher control measure

must be followed.

- * Any engineering certifications required must be valid at the time of entry.
- * The employer must ensure the work procedures, roles & responsibilities, emergency plan and rescue procedures are reviewed with the workers prior to the start of work.
- * The employer/owner must ensure appropriate measures and systems are in place to coordinate the health and safety of this employer's and any other employer's (sub contractors) at this worksite.
- * A ventilation system for the control of airborne contaminants in a confined space must be designed, installed and maintained in accordance with established engineering principles.
- * Gas monitoring equipment must be bump tested on the day of the entry and calibrated in accordance with the manufacturer's instructions.
- * The alternative measures may be performed by the employer's own workers and also by its contractors who will be entering the confined spaces under the accepted alternative measures.

Posting

A copy of these terms, along with any documents to which they refer, must be maintained at the worksite and be available for inspection by WorkSafeBC officers. The same documents must be posted on a suitable bulletin board in legible condition for the period of the acceptance. If affected workers will not receive notice by posting on a bulletin board, then the acceptance must be otherwise made known to all affected workers.

Joint Committee

A copy of these terms, along with any documents to which they refer, must be given to the Joint Occupational Health and Safety Committee or to the Worker Health and Safety Representative, as applicable.

Time-limited

The acceptance will be valid for the duration of the project, but for no longer than one (1) year (August 13, 2021) from the date of this acceptance.

Verification

The worksite may be inspected by WorkSafeBC officers to confirm these terms are being met.

Failure to Comply

If the terms and conditions of this acceptance are not complied with, the acceptance may be deemed to be void. Any non-compliance with the terms and conditions of this acceptance, or other infractions relating to the subject matter of the acceptance, may result in imposition of orders and administrative penalties.

Validity

The granting of this acceptance is based on the completeness and accuracy of the information provided to WorkSafeBC. Any failure to have provided complete and accurate information may result in revocation of the acceptance and imposition of orders and administrative penalties.

EXAMPLE ONLY

Reconsideration

WorkSafeBC may reconsider the granting of the acceptance, or its terms, if it is later found to have been granted in error, new information is received since it was granted or the applicable Occupational Health and Safety Regulation provisions are substantively amended.

If there are any questions regarding the items noted in this inspection report, please contact me for further clarification or other assistance:

Lisa Kennedy, CIH, CRSP
Occupational Hygiene Officer

WorkSafeBC
4980 Wills Road
Nanaimo, V9T 6C6
Phone: 250-751-8080

More information can be found under the Workers Compensation Act and the Occupational Health and Safety Regulation at the following website: www.worksafebc.com

REFERENCES

In addition to any orders, or other items, and the information provided in the Inspection Notes section in this Inspection Report, the officer may discuss other health and safety issues with the employer arising out of the inspection. The information below sets out the health and safety requirements discussed with the employer, and unless otherwise noted, violations of these requirements were not observed.

Reference	Details Discussed
OHS9.22(1) Section 9.18 does not apply if (a) a measure specified in section 9.18 to control or isolate harmful substances contained in adjacent piping from a confined space is not practicable, and (b) the employer implements alternative measures of control or isolation that are acceptable to the Board.	As applicable.
OHS9.22(2) All workers affected by measures implemented under Subsection 9.22(1) must be informed of the measures taken and instructed in any applicable work procedures.	As applicable.

Employer #	Mailing Address	Classification Unit #	Operating Location
138613	6300 HAMMOND BAY RD NANAIMO BC V9T 6N2	753004	001

Lab Samples Taken	Direct Readings	Results Presented	Sampling Inspection(s)	Workers onsite during Inspection	Notice of Project Number
N	N	N			

Inspection Report Delivered To	Employer Representative Present During Inspection	Worker Representative Present During Inspection	Labour Organization & Local
Rob Skwarczynski	Not Applicable	Not Applicable	CUPE 401

WorkSafeBC Officer Conducting Inspection
Lisa Kennedy

*Inspection Time	*Travel Time
0.25 hrs	0.00 hrs

*The time recorded above reflects the inspection time and travel time associated with this inspection report and includes time spent on pre and post-inspection activities. Additional time may be added for subsequent activity.

Request a Review

Any employer, worker, owner, supplier, union, or a member of a deceased worker's family directly affected may, within 45 calendar days of the delivery date of this report, in writing, request the Review Division of WorkSafeBC to conduct a review of an order, or the non-issuance of an order, by contacting the Review Division. Employers requiring assistance may contact the Employers' Advisers Office at 1-800-925-2233.

To submit a request online, visit <https://www.worksafebc.com/en/review-appeal/submit-request>

WorkSafeBC values your feedback. To obtain that feedback, an external market research provider may be contacting you to complete a survey.