

**Canadian Natural Resources Limited
GENERAL PRESSURE VESSEL INFORMATION**

Job 10.114702

District: Fort Saint John, B.C.	Skid No.
Facility: Wolverine	Location (LSD): d-66-D / 93-P-02
Vessel Name Equipment Number: Glycol Contactor	
Orientation: Vertical	
Status: In Service	Regulatory Inspection

PRESSURE VESSEL NAMEPLATE DATA

"A" or "G" or "S" (Sask.) or BC Registration Number. C56370		CRN Number: H 8383.1 / N 1093.2	
Vessel serial number: 5826-20		Size: 24 in. X 34 ft.	
Shell thickness: 28.6 mm		Shell material: SA 516 70N	
Head thickness: 27.0 mm		Head material: SA 516 70N	
Tube wall thickness:		Tube material:	
Tube diameter:		Tube length:	
Channel thickness:		Channel material:	
Design pressure	Shell: 1440 PSI	Operating pressure	Shell:
	Tubes:		Tubes:
Design Temp.	Shell: 130 Deg F	Operating temperature	Shell:
	Tubes:		Tubes:
X-ray: RT 1		Heat treatment: HT	
Code parameters: ASME VIII Div 1		Coated: No	
Manufacturer: Presson Manufacture		Year built: 1996	
Corrosion allowance: 3.2 mm		Manway: 8 inch accesses in lower and upper shell	

PRESSURE SAFETY VALVE NAMEPLATE DATA

PSV Tag #	Manufacture / Model / Serial	Set Pressure (PSI / kPa)	Capacity (scfm)	Size	Block Valve	Location	Service by Date
WAP 5069	Consolidated / 1912-FC-SG10 / B86741X-2-1	1440 PSI	8951 scfm	1.5 x 2.5	No	Lower shell	Unified / 09/22/09

SERVICE CONDITIONS-INDICATE ALL THAT APPLY

Sweet	Sour X	Oil	Gas X	Water X
Amine	LPG	Condensate	Air	Glycol

Other (Describe):

Inspection Interval _____ **PSV Service Interval** _____

(Determined by MIC in conjunction with Chief Inspector following guidelines of Canadian Natural Resources Limited Owner-User Inspection Program)

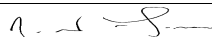
Reports reviewed and accepted by:

Mechanical Integrity Coordinator _____ **Date** _____

Fill out all forms as completely as possible. All information is important! Use back of sheets to record additional information or sketch if required. Copy of report to be filed by MIC at site, and copy sent to Chief Inspector

External Inspection Items	G	F	P	N/A	Comments
Insulation Verify sealed around manways, nozzles, no damage present, and there is no egress of moisture.				X	Vessel is not insulated.
External Condition Assess paint condition, areas peeling, record any corrosion, damage, etc (record location, size and depth of corrosion or damage)	X				Paint is in good overall condition – no exposed metal – no previous corrosion or pitting.
Leakage Record any leakage at flanges, threaded joints, weep holes on repads, etc.	X				No leaks observed.
Saddle/skirt Assess condition of paint, fire protection, and concrete. Look for corrosion, buckling, dents, etc. Look at vessel surface area near supports. Verify no signs of leakage at attachment to vessel and attachment welds are acceptable. Ground wire attached?	X				Skirt: Bolted directly to skid deck – no buckling or dents. No evidence of corrosion at attachment welds to vessel – no leaks. Ground wire attached to skid.
Anchor Bolts Hammer tap to ensure secure. Look for cracking in treads or signs of deformation.	X				Vessel skirt bolted firmly to skid – no deformation.
Concrete foundation Check for cracks, spalling, etc.				X	
Ladder / Platform Describe general condition, ensure support is secure to vessel, and describe any hazards.				X	
Nozzle Assess paint, look for leakage, and ensure stud threads are fully engaged. Record any damage, deflection, etc. Are nozzles gusseted?	X				Flanged and threaded nozzle joints are fully engaged. No damage or deflections – no leaks. Nozzles are not gusseted.
Gauges Ensure gauges are visible, working, no leakage, and suitable for range of MAWP/ Temp.	X				Pressure gauge: 0 to 2000 PSI. Temperature gauge: 0 to 250 deg F.
External Piping Ensure pipe is well supported. All clamps, supports, shoes, etc. in place. Look for evidence of structural overload, deflection, etc. Paint condition, external corrosion?	X				Piping is well supported, no deflection, all clamps and supports are in place. Piping is painted – no exposed metal surface.
Valving Ensure no leaks are visible. Valves are properly supported and chained if necessary.	X				Valves are supported properly – no leaks.
PSV Ensure PSV is set at pressure at or below that of vessel.	X				Located on lower shell – set at MAWP of vessel. No block valve / seal intact / outlet piping is same size as orifice – discharges to closed header.
NDE methods Was UT/ MPI done on vessel (MI coordinator to review results)	X				Ultrasonic corrosion survey carried out – no metal thickness detected below nominal minus corrosion allowance – no pitting.
<p>Recommendations or corrective actions : (Vessel is Fit for Service or describe corrective actions required) (MIC to review corrective actions with Operations, discuss with Chief Inspector where necessary, and get remedial action implemented) Recommendations: 1. No recommendations. Summary: This Glycol Contactor is in good condition, visual external and ultrasonic thickness inspection carried out – no metal thickness detected below nominal minus corrosion allowance. Corrosion rate based on greatest thickness loss (head) 0.060mm per year. Retirement Date to “T”min is year 2089.</p> <p>Vessel is fit for service.</p>					

API 20981



Inspected By: Dellas Wiedman

Date: April 15, 2014

Internal Inspection Items	G	F	P	N/A	Comments
Coating Assess coating. Describe area coated, general condition of coating.	X				Not coated
Anodes. How many, type, condition. % consumed. Are they being replaced?				X	none
Internal Piping Is there any? If so, carbon or stainless steel. Describe condition, dents, corrosion, erosion, etc. Ensure supports are secure and any bolts are suitable for future use.	X				Borescope viewed two 1 inch glycol coils; one at the top tray and one at the bottom shell – appeared to be in good condition - no corrosion or mechanical damage found
Trays How many? Type of material. Are valves in place. Check for erosion/ corrosion; wear on tray valve legs. Cleanliness?	X				Using the borescope <u>two</u> trays were inspected; the top tray and middle tray – trays appeared in good condition – found to be clean with no mechanical damage or corrosion to the trays or bubble caps
Baffles, deflector plates, etc. If present, describe condition. Look closely at welds attached to vessel wall.	X				Baffle found near bottom head – appears to be in good condition – no corrosion or distortion
Top Head Note all corrosion, erosion or mechanical damage. (If vessel is horizontal identify direction of this head)				X	Not viewed
Bottom Head Note all corrosion, erosion or mechanical damage. (If vessel is horizontal identify direction of this head)	X				Bottom head appears in good overall condition – no corrosion or mechanical damage noted
Shell Sections Record number of shell sections. Record location, size and depth of all erosion, corrosion or mechanical damage. Describe general condition. If any corrosion greater than corrosion allowance is observed in either shell or head, discuss with Chief Inspector before closing vessel.	X				Shell is in good condition where view with borescope – no corrosion or mechanical damage found
Demister pad Is it in place? Is it clean? If any corrosion is apparent in vessel, lift pad and check top head for corrosion.				X	None
Welds Inspect all welds, including attachment welds. Record all service-related damages and if there is any discuss with Chief Inspector before closing.	X				Welds appear in good condition – no corrosion or service related damage found
Repairs Required. If yes, ensure procedure and copy of AB 40 is on file, and one sent to local ABSA, and Chief Inspector	X				No repairs required
NDE Was any NDE done. (MI coordinator to review results)	X				Borescope was used to access internal, viewing in three location; top tray, middle tray and bottom head – no corrosion or damage found
<p>Recommendations or corrective actions : Vessel is Fit for Service or describe corrective actions required) (MIC to review corrective actions with Operations, discuss with Chief Inspector where necessary, and get remedial action implemented) Recommendations: No recommendations at this time. Summary: Borescope was used to access internal, viewing in three location; 2 inch nozzle at the top tray, middle tray and 8 inch inspection port at the bottom shell – no corrosion or damage found - Vessel is in overall good condition, visual external inspection and ultrasonic corrosion survey performed—no metal thickness detected below nominal minus the corrosion allowance. Vessel is fit for service.</p>					

API 48747
Inspected By: Andrew Neis

Date: May 29, 2014

Photo Table



Data plate



Overview



Skirt



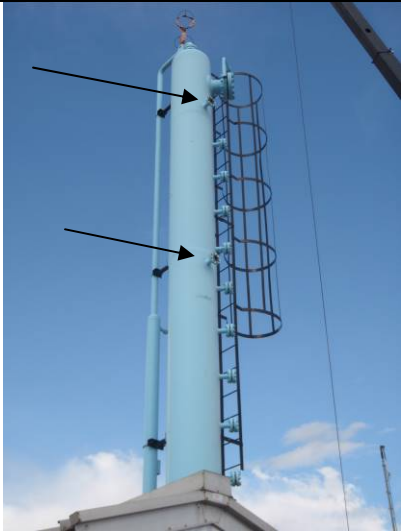
PSV



Overview



PSV Service Tag



Trays were viewed using 2 inch nozzle access



8 inch nozzle at bottom shell and glycol pass



Bottom Head



Lower Shell