Canadian Natural Resources Limited
GENERAL PRESSURE VESSEL INFORMATION **Job # 10.110056**

District: Grande Prairie AB.	Skid No.
Facility: Knopcik Gas Gathering	**Location (LSD): 102 / 06-02-74-11W6M**
Vessel Name Equipment Number: Separator	
Orientation: Vertical	
Status: In Service	**Regulatory Inspection**

PRESSURE VESSEL NAMEPLATE DATA

"A" or "G" or "S" (Sask.) or BC Registration Number. **A0435488**		CRN Number: N 0978.213	
Vessel serial number: V97103		Size: 20 in. X 8 ft.	
Shell thickness: 25.4 mm		Shell material: SA516-70	
Head thickness: 27.4 mm		Head material: SA516-70	
Tube wall thickness:		Tube material:	
Tube diameter:		Tube length:	
Channel thickness:		Channel material:	
Design pressure	Shell: 1480 PSI	Operating pressure	Shell: 0 – 3000 PSI
	Tubes:		Tubes:
Design Temp.	Shell: 100 Deg F.	Operating temperature	Shell: -40 – 160 Deg F.
	Tubes:		Tubes:
X-ray: RT 1		Heat treatment: HT	
Code parameters: ASME VIII, Div 1		Coated: no	
Manufacturer: Chadco Canada		Year built: 1997	
Corrosion allowance: 3.2 mm		Manway: no	

PRESSURE SAFETY VALVE NAMEPLATE DATA

PSV Tag #	Manufacture	Model #	Serial #	Set Pressure (kPa)	Capacity (scfm)	Service Date
G25591	**Taylor**	**T8200-1**	**40620-27**	**1440 PSI**	**5181**	**06/08**
CRN #	Service By	Block Valve	Location	Size	Code Stamp	
OG1316.2C	**Tyco Valve**	**no**	**Upper shell**	**1"x 1"**	**UV/NB**	

SERVICE CONDITIONS-INDICATE ALL THAT APPLY

Sweet	Sour X	Oil	Gas X	Water X
Amine	LPG	Condensate X	Air	Glycol
Other (Describe):				

Inspection Interval _____PSV Service Interval_____
(Determined by MIC in conjunction with Chief Inspector following guidelines of CNRL Owner-User Inspection Program)

Reports reviewed and accepted by:
Mechanical Integrity Coordinator_____Date_____

Fill out all forms as completely as possible. <u>All information</u> 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 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 in good overall condition – No exposed metal.**
Leakage Record any leakage at flanges, threaded joints, weep holes on repads, etc.		**X**			**Leakage at nozzle gasket to PSV.**
Saddle/Skirt Assess condition of paint, fire protection, 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: Welded directly to skid floor.** **No buckling or dents.** **No corrosion at attachment welds to vessel.** **Ground wire attached to skid.**
Anchor Bolts Hammer tap to ensure secure. Look for cracking in treads or signs of deformation.				**X**	**Vessel skirt welded directly to skid floor.** **No deformation.**
Concrete foundation Check for cracks, spalling, etc.				**X**	
Ladder / Platform Describe general condition, ensure support is secure to vessel, 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**			**Stud threads are fully engaged to nuts – no short bolts.** **No damage or deflections – leaks at PSV nozzle gasket.** **Nozzles are not gusseted.**
Gauges Ensure gauges are visible, working, no leakage, and suitable for range of MAWP/ Temp.	**X**				**Clear and clean – no leakage.** **Suitable for operational range of vessel.** **Bent needle on pressure gauge** **Pressure gauge 0 – 3000 PSI/temperature gauge -40 – 160 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.** **Paint peeling to 10% of area- corrosion on exposed metal.**
Valve: 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**				**Location: Upper shell of vessel – set below MAWP of vessel.** **No block valve between vessel and PSV.** **Discharge piping is same size as valve out let.** **Seal in place.**

NDE methods Was UT/ MPI done on vessel (MI coordinator to review results)	**X**				**Ultrasonic corrosion survey carried out: Shell metal thickness detected below nominal: Calculations carried out – Nominal thickness is 27.4 mm / min thickness is 26.3 mm / T min thickness is 20.5 mm. Pipe metal thickness detected below nominal minus corrosion allowance. Thickness calculations carried out: UT point 250 (2" Elbow) – nominal thickness is 5.5mm / min thickness is 4.8mm / T min thickness is 2.2mm.**

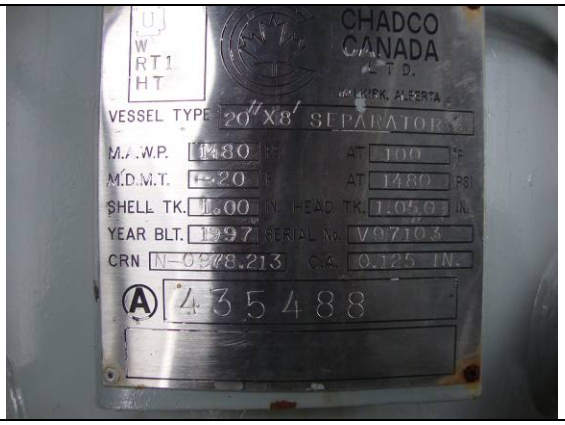
Recommendations or corrective actions : Vessel is Fit for Service or describe corrective actions required)
(MIC to review corrective actions with Operations, discuss with Chief Inspector where necessary, and get remedial action implemented)
Recommendations: 1)Replace leaking gasket at PSV nozzle. 2) Replace pressure gauge.
Summary: Vessel is in overall good condition, visual external inspection and ultrasonic corrosion survey performed – pipe metal thickness detected below nominal minus corrosion allowance. Thickness calculations carried out to ensure sufficient metal exists for safe operation.
Long term corrosion rate based on greatest thickness loss (shell) 0.086 mm per year. Retirement Date to "T"min is year 2078.

Vessel is fit for service.

Inspected By: Gerry Avery **Date:** March 9, 2011

Photo Table

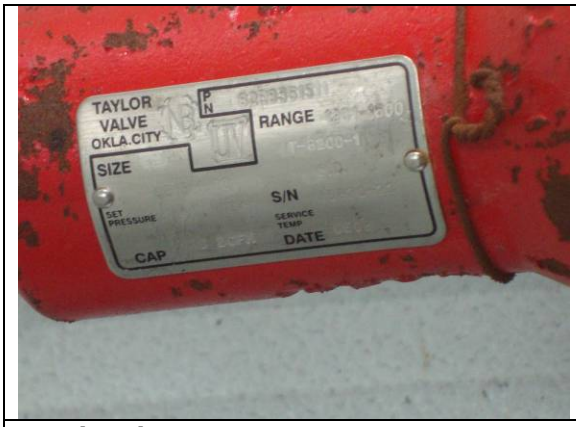
LSD



Vessel data plate

Vessel pressure gauge


Vessel temperature gauge

	
PSV data plate	Vessel PSV
	
Vessel overview	Leak at PSV nozzle