



BOILER AND PRESSURE VESSEL INSPECTIONS INC.

## PRESSURE VESSEL INSPECTION REPORT

ENTERED

P.M. 2212

COMPANY	Legacy	DATE	4 Nov-14
FACILITY	Pierson	LSD	9-32-1-28W1M
EMERALD JOB NUMBER		COMPANY IDENTIFICATION #	

## VESSEL DATA

DESCRIPTION	H Treater	MANUFACTURER	Sivalls Inc -1
MFG. DATE	2010	NB#/A#	NB 16539
SERIAL #	117025	CRN#	N7780.123
UNIT NUMBER(S#)		STATUS	Active
MAWP SHELL	75 <input type="checkbox"/> kpa <input checked="" type="checkbox"/> psi @ Temp 230 <input type="checkbox"/> C <input checked="" type="checkbox"/> F	MDMT	-20 <input type="checkbox"/> C <input checked="" type="checkbox"/> F @75 <input type="checkbox"/> kpa <input checked="" type="checkbox"/> psi
MAWP TUBE	<input type="checkbox"/> kpa <input type="checkbox"/> psi @ Temp <input type="checkbox"/> C <input type="checkbox"/> F		

PSV INFORMATION		<input checked="" type="checkbox"/> N/A	2 <sup>ND</sup> PSV		<input type="checkbox"/> N/A
MANUFACTURER	Taylor	LOCATION	Shell	MANUFACTURER	Taylor
SERIAL #	33162-40	CRN #	OG1316.2C	SERIAL #	33162-41
MODEL #	T-8300-3	PSV #		MODEL #	T-8300-3
SET PRESSURE	75 psi	CAPACITY	2822 scfm	SET PRESSURE	75 spi
INLET SIZE	3"	OUTLET SIZE	3"	INLET SIZE	3"
LAST SERVICE	11-14	SERVICE INTERVAL	3 years	LAST SERVICE	11-14
CO. IDENT. #	13442			CO. IDENT. #	13443

VESSEL MATERIAL AND THICKNESS ☐ N/A

DIAMETER	8	LENGTH	30	CA (Tca)		JOINT EFFICIENCY	
HEAD MATERIAL		NOZZLE/PIPING MATERIAL		SHELL MATERIAL			
ALLOWABLE STRESS							
NOMINAL HEAD THICKNESS (T <sub>nom</sub> )		MINIMUM HEAD THICKNESS (T <sub>min</sub> )					
NOMINAL NOZZLE/PIPING THICKNESS (T <sub>nom</sub> )		MINIMUM NOZZLE/PIPING THICKNESS (T <sub>min</sub> )					
NOMINAL SHELL THICKNESS (T <sub>nom</sub> )		MINIMUM SHELL THICKNESS (T <sub>min</sub> )					
CORROSION RATE	CML #	SHORT TERM		LONG TERM			
REMAINING LIFE (R.L.)		FIT FOR SERVICE	<input checked="" type="checkbox"/>	<input type="checkbox"/>	NOT FIT FOR SERVICE	<input type="checkbox"/>	<input type="checkbox"/>
VESSEL GROUNDED	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A	VESSEL SECURED/BOLTED DOWN		<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A			
NAMEPLATE LEGIBLE	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A						
VESSEL REQUIRES REPAIRS	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> N/A	FUTURE ACTION REQUIRED		<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A			
INTERNAL INTERVAL	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> _____						
EXTERNAL INTERVAL	<input type="checkbox"/> 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> _____						
INSPECTION METHOD	<input checked="" type="checkbox"/> VI <input checked="" type="checkbox"/> VE <input type="checkbox"/> UT <input type="checkbox"/> _____						

Company Sign Off:	Date: 4 November 2014
INSPECTION REQUESTED BY: Ray Dee	INSPECTION PERFORMED BY: Cory Sasyniuk



**PRESSURE VESSEL INSPECTION REPORT**
**INTERNAL VISUAL INSPECTION**

INTERNAL PROTECTION		ANODES	
<input type="checkbox"/> N/A <input type="checkbox"/> Good Condition <input type="checkbox"/> Blistered – Light <input checked="" type="checkbox"/> Disbonded <input checked="" type="checkbox"/> Mechanical Damage <input checked="" type="checkbox"/> Coating Mills <u>12-30 mls</u>	<input type="checkbox"/> Coating <input type="checkbox"/> Holidays <input type="checkbox"/> Blistered – Severe <input checked="" type="checkbox"/> Chipped/Peeling <input type="checkbox"/> Mechanically Removed or Sandblasted	<input type="checkbox"/> N/A <input type="checkbox"/> Dirty <input checked="" type="checkbox"/> New/Replaced <input checked="" type="checkbox"/> Bonding Cable Attached <input type="checkbox"/> None	<input type="checkbox"/> Good Condition <input checked="" type="checkbox"/> Consumed <u>10</u> % <input type="checkbox"/> Missing
DEMISTER SCREEN/PAD		MANWAY	
<input checked="" type="checkbox"/> N/A <input type="checkbox"/> Dislodged <input type="checkbox"/> Missing	<input type="checkbox"/> Good Condition <input type="checkbox"/> Broken <input type="checkbox"/> Fowled _____%	<input type="checkbox"/> N/A <input type="checkbox"/> Coating Damage <input type="checkbox"/> Mechanical Damage <input type="checkbox"/> Bolts Missing/Loose	<input checked="" type="checkbox"/> Good Condition <input type="checkbox"/> Internal Corrosion <input type="checkbox"/> Seal Face Corrosion <input checked="" type="checkbox"/> Correct Bolting/Size/Type
FIRETUBES		TRAYS	
<input type="checkbox"/> N/A <input type="checkbox"/> Good Condition <input type="checkbox"/> Cracked <input checked="" type="checkbox"/> Corrosion	<input type="checkbox"/> Scaled <input checked="" type="checkbox"/> Heat Impinged <input checked="" type="checkbox"/> Dented/Distorted <input type="checkbox"/> Wear	<input checked="" type="checkbox"/> N/A <input type="checkbox"/> Collapsed <input type="checkbox"/> Loose <input type="checkbox"/> Wear <input type="checkbox"/> Poor	<input checked="" type="checkbox"/> Good Condition <input type="checkbox"/> Distorted <input type="checkbox"/> Missing <input type="checkbox"/> Corrosion <input type="checkbox"/> Holes/Short Circuiting
<input checked="" type="checkbox"/> Firetube Failure <input type="checkbox"/> MPI/UT <input type="checkbox"/> To Follow			
SHELL		VESSEL INTERNALS	
<input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good Condition <input type="checkbox"/> Pitted – Light <input type="checkbox"/> Scaled – Light	<input type="checkbox"/> Internal Corrosion <input type="checkbox"/> Pitted – Severe <input type="checkbox"/> Scaled – Heavy <input type="checkbox"/> Blistered	<input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good Condition <input type="checkbox"/> Weir/Baffle/Divider Damage <input type="checkbox"/> Downcomer Corrosion <input type="checkbox"/> See Comments	
<input type="checkbox"/> MPI/UT <input type="checkbox"/> To Follow			
HEAD		HEAD	
<input type="checkbox"/> Top <input type="checkbox"/> North <input checked="" type="checkbox"/> West <input type="checkbox"/> N/A		<input type="checkbox"/> Bottom <input type="checkbox"/> South <input checked="" type="checkbox"/> East <input type="checkbox"/> N/A	
<input checked="" type="checkbox"/> Good Condition <input type="checkbox"/> Pitted – Light <input type="checkbox"/> Scaled – Light <input type="checkbox"/> Blistered	<input type="checkbox"/> Internal Corrosion <input type="checkbox"/> Pitted – Severe <input type="checkbox"/> Scaled – Heavy	<input checked="" type="checkbox"/> Good Condition <input type="checkbox"/> Pitted – Light <input type="checkbox"/> Scaled – Light <input type="checkbox"/> Blistered	<input type="checkbox"/> Internal Corrosion <input type="checkbox"/> Pitted – Severe <input type="checkbox"/> Scaled – Heavy
INTERNAL PIPING			
INTERNAL PIPING <input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good Condition <input type="checkbox"/> Corrosion <input type="checkbox"/> Missing/Dents <input type="checkbox"/> Supports <input type="checkbox"/> See Comments			

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**EXTERNAL VISUAL INSPECTION**

ACCESS & COVERAGE				SUPPORTS			
MANWAY/ACCESS SIZE		18" <input type="checkbox"/> N/A		VESSEL HAS		<input type="checkbox"/> Skirt <input checked="" type="checkbox"/> Legs <input type="checkbox"/> Base Plate <input type="checkbox"/> N/A	
COATING		<input type="checkbox"/> Good <input checked="" type="checkbox"/> Disbonded <input type="checkbox"/> Blistered		<input checked="" type="checkbox"/> Good Condition <input type="checkbox"/> Cracked <input type="checkbox"/> Distorted <input type="checkbox"/> Broken <input type="checkbox"/> Bolts Missing/Loose/Damaged <input type="checkbox"/> Support Ring Damage <input type="checkbox"/> Skirt Access <span style="float:right"><input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A</span>			
<input type="checkbox"/> N/A <input type="checkbox"/> Poor Cleaning <input checked="" type="checkbox"/> Adequately Clean <input type="checkbox"/> Peeling/U.V. Damage							
SHELL				INSULATION			
<input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good Condition <input type="checkbox"/> External Corrosion <input type="checkbox"/> Pitted – Light <input type="checkbox"/> Dented/Distorted		<input type="checkbox"/> Insulated/Cladd <input type="checkbox"/> Good <input type="checkbox"/> Poor <input type="checkbox"/> Scaled – Light <input type="checkbox"/> Scaled – Severe <input type="checkbox"/> Blistered <input type="checkbox"/> See Comments		<input type="checkbox"/> Good <input type="checkbox"/> Poor <input type="checkbox"/> N/A			
HEAD				NOZZLES			
<input type="checkbox"/> Top <input type="checkbox"/> North <input checked="" type="checkbox"/> West <input type="checkbox"/> N/A				<input type="checkbox"/> N/A <input checked="" type="checkbox"/> Good Condition <input type="checkbox"/> Scaled <input type="checkbox"/> Poor Welding <input type="checkbox"/> Seal Face Corrosion <input type="checkbox"/> Internal Corrosion			
<input checked="" type="checkbox"/> Good Condition <input type="checkbox"/> Pitted – Light <input type="checkbox"/> Scaled – Light <input type="checkbox"/> External Coating <input type="checkbox"/> Dented/Distorted				<input type="checkbox"/> Cracked <input type="checkbox"/> Plugged <input type="checkbox"/> Leaking <input type="checkbox"/> Bolts Missing/Loose/Damaged			
<input type="checkbox"/> External Corrosion <input type="checkbox"/> Pitted – Severe <input type="checkbox"/> Scaled – Heavy <input type="checkbox"/> Insulated/Clad <input type="checkbox"/> Good <input type="checkbox"/> Poor <input type="checkbox"/> See Comments							
EXTERNAL PIPING				HEAD			
<input type="checkbox"/> Top <input type="checkbox"/> North <input checked="" type="checkbox"/> West <input type="checkbox"/> N/A				<input type="checkbox"/> Bottom <input type="checkbox"/> South <input checked="" type="checkbox"/> East <input type="checkbox"/> N/A			
<input checked="" type="checkbox"/> Good Condition <input type="checkbox"/> Pitted – Light <input type="checkbox"/> Scaled – Light <input type="checkbox"/> External Coating <input type="checkbox"/> Dented/Distorted				<input checked="" type="checkbox"/> Good Condition <input type="checkbox"/> Pitted – Light <input type="checkbox"/> Scaled – Light <input type="checkbox"/> External Coating <input type="checkbox"/> Dented/Distorted			
<input type="checkbox"/> External Corrosion <input type="checkbox"/> Pitted – Severe <input type="checkbox"/> Scaled – Heavy <input type="checkbox"/> Insulated/Clad <input type="checkbox"/> Good <input type="checkbox"/> Poor <input type="checkbox"/> See Comments				<input type="checkbox"/> External Corrosion <input type="checkbox"/> Pitted – Severe <input type="checkbox"/> Scaled – Heavy <input type="checkbox"/> Insulated/Clad <input type="checkbox"/> Good <input type="checkbox"/> Poor <input type="checkbox"/> See Comments			
EXTERNAL PIPING							
External Piping	<input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Good Condition	<input type="checkbox"/> Leaks	<input type="checkbox"/> Corrosion	<input type="checkbox"/> See Comments		
Cladding/Insulation	<input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Good Condition	<input type="checkbox"/> Dents/Holes	<input type="checkbox"/> Missing	<input type="checkbox"/> See Comments		
Supports	<input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Good Condition	<input type="checkbox"/> Missing/Stress	<input type="checkbox"/> Corrosion	<input type="checkbox"/> See Comments		
Coating	<input type="checkbox"/> N/A	<input checked="" type="checkbox"/> Good Condition	<input type="checkbox"/> Chipped/Missing	<input type="checkbox"/> Corrosion	<input type="checkbox"/> See Comments		
FIRETUBE BURNER				FIRETUBE STACK			
<input checked="" type="checkbox"/> N/A				<input checked="" type="checkbox"/> N/A			
<input type="checkbox"/> Misalignment <input type="checkbox"/> Missing <input type="checkbox"/> Not Fired <input type="checkbox"/> Requires Repair/Replacement/Combustion Analysis				<input type="checkbox"/> Corrosion/Holes <input type="checkbox"/> Poor Welding <input type="checkbox"/> Cracked <input type="checkbox"/> Requires Repair/Replacement <input type="checkbox"/> Missing			



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**INTERNAL VISUAL INSPECTION**

**DETAILED OBSERVATION (INSPECTIONS NOTES)**

☒ N/A

Internal Surfaces of treater are in good condition with no pitting or corrosion present. Coating is severely disbonded bymanway on west head to backweld interface, Center baffle to shell weld interface and course 1 to 2 circ weld in firetube section. Coating application in these interfaces has an average mil thickness of 30 mils. Anchor profile appears adequate. Failure mechanisms present are flash rusting and excessive coating application beyond the MFG specification. All areas that require coating repairs were marked. All sample collars are Stainless Steel materials. Baffle has a Oil Coallesing grid box installed for heavy oil separation. Grid is not curently installed. All accessible welds are in good condition with adequate reinforcement present. Coating has radial crackiing present on internal firetube support beam to shell, baffle to shell and nozzle to shell interfaces. Coating in these areas ranges in thickness from 25-41 mils (over range of application by 10-25 mils). Next inspection may require recoat due to poor application standards. Indications of drips, runs and sags are also present in nozzles and shell surfaces. Accessible welds are in an as welded condition with adequate reinforcement present.

**RECOMMENDATIONS**

☐ N/A

Repair coating and remove all scale deposits.

**EXTERNAL VISUAL INSPECTION**

**DETAILED OBSERVATIONS (INSPECTION NOTES)**

☐ N/A

Vessel is housed in building. External surfaces are protected with paint. The paint is in good condition. Firetube has been removed for UT MT examination. Firetube burner leg is distorted from overexposure to heat. UT low of .345" present on burner leg of firetube (tube nominal thickness .500"- 24 " od pipe). Tube to be replaced with new tube from Grimes in Lampman. MDR for firetube was available for proof of construction. Primary piping is welded construction and secondary is threaded. All piping joint connections are tight with no leakage present. Piping is secured and supported throughout skid.

Replacement Tube nameplate info:

MFG - Sivalis Inc -1 , NB17998, sn 121310, built 2012, MAWP 75 psi @ 230 F, -20F.

Replacement firetube was installed in vessel for leak testing. Held pressure for 1 hr at 90% MAWP of 75 psi (68 psi test). Chart recorder and pressure gusge supplied by Apex. Signed off Hydrotest for package with Cowan Oilfield. Vessel is fit for service.

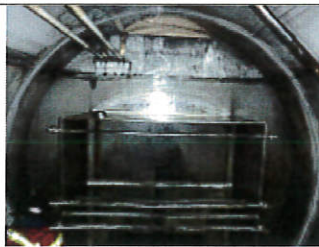
**RECOMMENDATIONS**

☐ N/A

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Vessel is fit for operation

**PICTURES**




Coating cracks north head

North head coating cracks

Baffle coating cracks



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Course 2 -3 circ weld coating	Distorted tube leg	New tube leak test	New tube nameplate
			
Test gauge	Test chart- inoperative drive motor		

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