

E-650

PROPANE SUBCOOLER

Quality Control Documentation



MANUFACTURED AND CERTIFIED BY
**THERMO DESIGN
ENGINEERING LTD.**

EDMONTON

ALBERTA

CANADA

UNIT NAME

TAG NUMBER

PROPANE SUBCOOLER

L-650

CR. NUMBER

SERIAL NUMBER

⑦ NUMBER

N-742121

1624



M.A.W.P.

AT TEMP.

M.D.T.

AT PRESSURE

260 PSIG
1500 PSIG

150

-70

260 PSIG
1500 PSIG

YEAR BUILT

CORR. ALL.

DRAWING NUMBER

1998

6.625 IN

9697-0850

-2 LB

DIAMETER

LENGTH

CAPACITY

WEIGHT

6.625 IN

20-OTS/12

3.42 CU FT

1800 LB

SHELL MATL.

HEAD MATL.

TBSHT. MATL.

COIL MATL.

SA-733-6

SA-350-12

SA-316-70

SA-179

SHELL THK.

HEAD MIN. THK.

TBSHT. THK.

COIL THK.

0.230 IN

600 E 1/2 IN

1/2 IN

1/4 BW

CTC

W
RT-2

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EDMONTON

ALBERTA

CANADA

UNIT NAME

TAG NUMBER

PROPANE SUBCOOLER

E-650

CR. NUMBER

SERIAL NUMBER

④ NUMBER

N-7421-21

#1624

M.A.W.P.

AT TEMP.

M.D.M.T.

AT PRESSURE

SS=260 PSIG
TS=1300 PSIG

150°F

-49°F

SS=260 PSIG
TS=1300 PSIG

YEAR BUILT

CORR. ALL

DRAWING NUMBER

1998

0.0625 IN

3097-0850-211

DIAMETER

LENGTH

CAPACITY

WEIGHT

6.625 IN OD

20-0TS/TS

3.42 CU FT

1800 LBS.

SHELL MATL.

HEAD MATL.

TBSHT. MATL.

COIL MATL.

SA-333-6

SA-350-LFZ
SA-350-LFZSA-516-70N
SA-516-70N

SA-179

SHELL THK.

HEAD MIN. THK.

TBSHT. THK.

COIL THK.

0.280 IN

600#BLD FLG
600#BLD FLG1.250 IN
1.250 IN

14 BWG

LG	(CUT WEB AS SHOWN) - SHOE	SA-36
W NUT		SAE-GR.5
G	(CUT IN HALF) - NAME PL BRACKET	SA-36
168 LG	(TRIM TO FIT SHELL OD)	SA-36
IEY HEAD PLUG		SA-350-LF2
ON CPLG @ 4" 102 LG		SA-350-LF2
(MACHINE AS PER DET.) - BAFFLE PL		SA-36
& (1) @ 18'-9" 5715 LG	- TIE ROD	SA-36
ING @ 20'-0" 6096 LG		SA-179
FLG SCH. 160 BORE		SA-350-LF2
PE (CUT AS REQ'D)		SA-333-6
FLG SCH. XHY BORE		SA-350-LF2
PE (CUT AS REQ'D)		SA-333-6
5/8" 168 OD	(MACHINE AS PER DETAIL)	SA-516-70N
150# - 600# ANSI RF FLG.		304 SS FLEX SA-320-L7/SA-194-4
D FLG		SA-350-LF2
FLG SCH. 80 BORE		SA-350-LF2
80 SML'S PIPE @ 7 1/8" 181 LG		SA-333-6
0 SML'S PIPE @ 19'-9 7/8" 11833 LG		SA-333-6
DESCRIPTION		MATERIAL

AL LIST

	MAY.13/97	S.R.
	APR.30/97	S.R.
N	DATE	BY

ENGINEERING LTD.	THIS DRAWING IS THE CONFIDENTIAL PROPERTY OF TDE AND IS ISSUED ON THE UNDERSTANDING THAT NOTHING IS TO BE COPIED OR COMMUNICATED TO A THIRD PARTY WITHOUT THE WRITTEN AUTHORIZATION OF TDE.	
MENT INSTALLATION	JOB CODE	REV.#1

LANT
W6M

AS

0'-0"[6096]TS/TS
R (DUTY: 146,750 BTU/H)

#1544	TAG	E-650
DATE May 13/97	APPROVED CK	May 26/97.

ALBERTA BOILERS SAFETY ASSOCIATION
PROVINCE OF ALBERTA
SAFETY CODES ACT

REG. No. N-7421-2

DWG. No. 9037-0210-206/Rev 1

	Design Press kPa	Design Temp. °C
<u>SHELL SIDE</u>	<u>1793</u>	<u>-45/65</u>
<u>TUBE SIDE</u>	<u>8965</u>	<u>-45/65</u>

ACCEPTED
JUL 30 1997

Yr. ___ Mo. ___ Day ___ Signed Larry O. Fraser
Larry O. Fraser, P. Eng.
Design Survey Engineer

AUTHORIZED INSPECTOR TO BE GIVEN TRAVEL SHEET PRIOR TO CONSTRUCTION
SO THAT HE CAN INDICATE HOLD POINTS. HOLD POINTS ESTABLISHED *9/1/81*

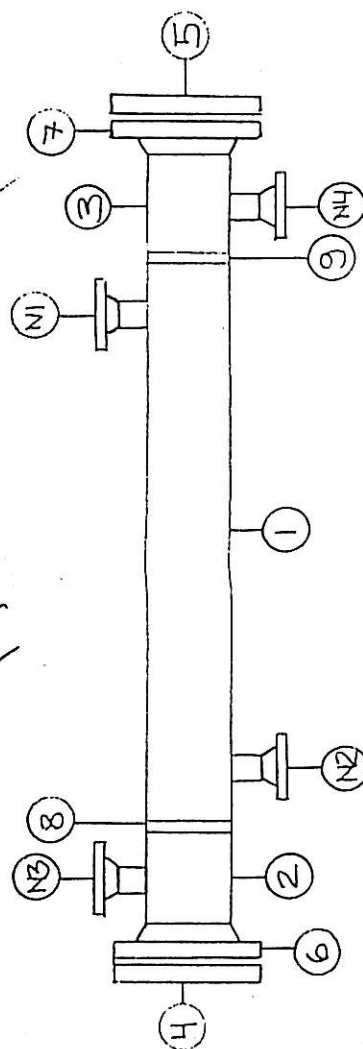
D^R L^R H 97-125

VESSEL TITLE		SERIAL NUMBER	TAG NO.	A.T. HOLD POINTS	(A) NUMBER	
65 1/2" OD x 20'-0" TS/TS PROPANE SUBCOOLER		#1624	E-650		DATE, FUNCTION COMPLETED AND INSPECTORS INITIALS	
					C.R. NUMBER	JOB CODE
		CTC				
NO.	FUNCTION	COMMENTS		T. D. E.	AUTHORIZED INSPECTOR	
1	APPROVED DRAWINGS			Dec 5, 97 Tom	RH 98-3-23	
2	MAT. CHECKED AGAINST DWG.			Dec 05, 97 Tom	RH 98-1-27	
3	MILL TEST CHECKED			Dec 05, 97 Tom	RH 98-3-23	
4	IMPACT TESTS			—		
5	VESSEL LAYOUT			98-01-08 (4)		
6	FIT UP	SHELL & HEADS		98-01-08 (4)		
7		NOZZL'S & FITTINGS		98-01-08 (4)		
8	INTERNAL INSPECTION			X 98-01-23 (4)	T.S. RH 98-1-23 S.S. RH 98-1-16	
9	WELD SIZE			98-01-27 (4)		
10	WELDERS I.D.			98-01-27 (4)	RH 98-1-27	
11	RADIOGRAPHS	CIRC. SEAM - SPOT		98-01-27 (4)	RH 98-1-26	
12	OTHER N.D.E.			—		
13	RELEASE FOR P.W.H.T.	NONE		—		
14	P.W.H.T. CHART CHECKED			—		
15	EXTERNAL INSPECTION			98-01-27 (4)	RH 98-1-27	
16	HYDROSTATIC TEST	SG: 390 PSIG TS: 1950 PSIG		X 15-98-01-27 (4) SS 98-01-22 (4)	T.S. RH 98-1-27 S.S. RH 98-1-22	
17	HYDRO GAUGES	TH-116, TH-117.		98-01-27 (4)		
18	DATA REPORT			98-03-23 (4)	RH 98-3-23	
19	NAME PLATES			98-03-23 (4)	RH 98-3-23	

RT-PROGRESS

x's-1

PART	SPECIFICATION	HEAT NO.	THK.
SHELL ✓ 1	SA 333-6	9525C	6" SCH 80
✓ 2	SA 333-6	9892C	6" SCH 80
✓ 3	SA 333-6	9892C	6" SCH 80
BLD-FIG ✓ 4	SA 350 LF2	BLIND	6" 600#
✓ 5	SA 350 LF2	BLIND	6" 600#
✓ 6	SA 350 LF2	RFWN	6" 600#
✓ 7	SA 350 LF2	RFWN	6" 600#
T-SHEETS ✓ 8	SA 516-70N	2822S-57589	1.250"
✓ 9	SA 516-70N	2822S-57589	1.250"
✓ N1	SA 333-6	78081	2" SCH 40
✓ N2	SA 333-6	78081	2" SCH 40
✓ N3	SA 333-6	61272	2" SCH 160
✓ N4	SA 333-6	61272	2" SCH 160





TAQA NORTH DATA									
EQUIP NO.: 603HT005			RAMS ID TAG NO.: NEW			PRN: N/A		CATEGORY:	
PLANT/FIELD: CHINCHAGA GAS PLANT				LSD: C-032-H / 094-H-08		LOCATION: GAS PLANT			
EQUIP. NAME : PROPANE SUB-COOLER					CLASS : HT			TYPE: SUB-COOLERS	
SERVICE: <input checked="" type="checkbox"/> Sweet <input type="checkbox"/> Sour		H2S: N/A PPM		FLUID: PROPANE		S/D REQT.: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Partial			
OPERATING PRESSURE: N/A <input type="checkbox"/> kPa <input type="checkbox"/> PSI				OPERATING TEMPERATURE: 17 <input checked="" type="checkbox"/> °C <input type="checkbox"/> °F					
OPERATING STATUS: <input checked="" type="checkbox"/> IN SERVICE <input type="checkbox"/> Not In Service				M/WAY(16"AND ABOVE): <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No		SIZE: 6"			

MANUFACTURING DATA									
MFG.: THERMO DESIGN		DWG. NO.: 9097-0850-211		SERIAL NO.: 1624		YR. BUILT: 1998		STAMP: U,W	
CRN: N7421.21		CODE/DIV.: ASME VIII DIV 1		PARA.: N/A		SUPPORT: <input type="checkbox"/> Skirt <input type="checkbox"/> Saddles <input checked="" type="checkbox"/> Nozzles <input type="checkbox"/> N/A			
MAWP: 1793 <input checked="" type="checkbox"/> kPa <input type="checkbox"/> PSI		@ TEMP: 66 <input checked="" type="checkbox"/> °C <input type="checkbox"/> °F		MDMT: -45 <input checked="" type="checkbox"/> °C <input type="checkbox"/> °F		VOLUME: 3.42 <input type="checkbox"/> M ³ <input checked="" type="checkbox"/> FT ³			
FLANGE RATING: 300#		PWHT: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		RADIOGRAPHY: <input type="checkbox"/> RT1 <input checked="" type="checkbox"/> RT2 <input type="checkbox"/> RT3 <input type="checkbox"/> RT4 <input type="checkbox"/> Spot <input type="checkbox"/> Full <input type="checkbox"/> N/A					
SIZE: 168 <input checked="" type="checkbox"/> mm. <input type="checkbox"/> inch. <input type="checkbox"/> ID <input checked="" type="checkbox"/> OD		LENGTH: 6096 <input checked="" type="checkbox"/> mm. <input type="checkbox"/> inch.		HEIGHT: N/A <input type="checkbox"/> mm. <input type="checkbox"/> inch.					
INSULATION TYPE: <input type="checkbox"/> Fiberglass <input type="checkbox"/> Wool <input checked="" type="checkbox"/> Low Temp <input type="checkbox"/> Asbestos Other:						INSULATION THK: 40 <input checked="" type="checkbox"/> mm. <input type="checkbox"/> inch.			
SECTION		MATERIAL		NOMINAL mm		C.A. mm			
SHELL		SA-333-6		7.1 MM		1.6 MM			
HEAD		SA-350-LF2		600# BLIND FLANGE		1.6 MM			
COMMENTS:									

TUBING DATA									
MAWP: 8963 <input checked="" type="checkbox"/> kPa <input type="checkbox"/> PSI		@ TEMP: 66 <input checked="" type="checkbox"/> °C <input type="checkbox"/> °F		TEMA CLASS: N/A			TYPE: N/A		
TUBE SIZE: 152 mm. <input type="checkbox"/> ID <input checked="" type="checkbox"/> OD		NUMBER (QTY OF TUBES): N/A		GAUGE (BWG): 14		JOINT: <input type="checkbox"/> Welded <input type="checkbox"/> Rolled			
SECTION		MATERIAL		NOMINAL mm		C.A. mm			
TUBE SIDE SHELL		SA-516-70N		31.8 MM		1.6 MM			
N/A		N/A		N/A		N/A			
N/A		N/A		N/A		N/A			

TRAY/PACKING DATA					
TRAY TYPE: N/A		NUMBER (# OF TRAYS): N/A		PACKING TYPE: N/A	
MATERIAL: N/A		MANUFACTURER: N/A			

COATING/LINING/CLADDING DATA			
AREA	TYPE	MATERIAL	YR. APPLIED
EXTERNAL:	EPOXY	N/A	N/A
INTERNAL:	N/A	N/A	N/A
LINING:	N/A	N/A	N/A
CLADDING:	STAINLESS STEEL	N/A	N/A

PRESSURE RELIEF DEVICES DATA		<input type="checkbox"/> PSV not located		<input type="checkbox"/> No PSV	
EQUIP. NO.	TAG NO.	SET	CAPACITY	CAP UNITS/OTHER	
603SVVS018 (TUBE)	N/A	8963 <input checked="" type="checkbox"/> kPa <input type="checkbox"/> PSI	3408	<input checked="" type="checkbox"/> SCFM <input type="checkbox"/> LB/hr. <input type="checkbox"/> GAL/min.	
603SVVS012 (SHELL)	N/A	1793 <input checked="" type="checkbox"/> kPa <input type="checkbox"/> PSI	14992	<input checked="" type="checkbox"/> SCFM <input type="checkbox"/> LB/hr. <input type="checkbox"/> GAL/min.	
N/A	N/A	N/A <input type="checkbox"/> kPa <input type="checkbox"/> PSI	N/A	<input type="checkbox"/> SCFM <input type="checkbox"/> LB/hr. <input type="checkbox"/> GAL/min.	

FORM U-1 MANUFACTURER'S DATA REPORT FOR PRESSURE VESSELS
As Required) Provisions of the ASME Code Rules, Sect VIII, Division 1

CTC, PG. 1 OF 2

1. Manufactured and certified by THERMO DESIGN ENGINEERING LTD., 1624 - 70 AVENUE, EDMONTON, ALBERTA CANADA T6P 1P5
(Name and address of Manufacturer)
2. Manufactured for Chauvco Res. Ltd. c/o Tartan Eng. Ltd., 1700, 800 - 6th Avenue S.W., Calgary, AB T2P 3G3
(Name and address of Purchaser)
3. Location of Installation Chinchaga Gas Plant, British Columbia, LSD: C-32-H/94-H-8
(Name and address)
4. Type: Horizontal Subcooler #1624 N-7421.21 9097-0850-211/Rev.0 1998
(Horiz., vert., or sphere) (Tank separator, jkt. vessel, heat exh., etc.) (Mfg's serial No.) (CRN) (Drawing No.) (Nat'l. Bd. No.) (Year built)
5. ASME Code, Section VIII, Div. 1 Edition 1995, Addenda 1996
Edition and Addenda (date) Code Case No. Special Service per UG-120(d)

Items 6 - 11 Incl. to be completed for single wall vessels, jackets of jacketed vessels, shell of heat exchangers, or chamber of multi-chamber vessels.

6. Shell (a) No. of course(s): 1 (b) Overall length (ft & in.): 20'-0" TS/TS

Course(s)			Material	Thickness		Long. Joint (Cat. A)			Circum. Joint (Cat. A, B & C)			Heat Treatment	
No.	Diameter, in.	Length (ft & in.)	Spec./Grade or Type	Nom.	Corr.	Type	Full, Spot, None	Eff.	Type	Full, Spot, None	Eff.	Temp.	Time
1	6.065"ID	19'-9 7/8"	SA-333-6	0.280"	0.0625"	Sml's Pipe	N/A	100	Sgl"V"	CS:Spot	100	N/A	N/A

7. Heads: (a)		N/A N/A					(b)		N/A N/A							
(Mat'l Spec. No., Grade or Type) H.T. - Time & Temp												(Mat'l Spec. No., Grade or Type) H.T. - Time & Temp				
	Location (Top, Bottom, Ends)	Thickness		Radius		Elliptical Ratio	Conical Apex Angle	Hemispherical Radius	Flat Diameter	Side to Pressure		Category A				
		Min.	Corr.	Crown	Knuckle					Convex	Concave	Type	Full, Spot, None	Eff.		
(a)	N/A															
(b)	N/A															

If removable, bolts used (describe other fastening) N/A (Mat'l Spec. No., Grade, Size, No.)

8. Type of jacket N/A Jacket closure N/A
(Describe as ogee & weld, bar, etc.)
 If bar, give dimensions N/A If bolted, describe or sketch.

9. VP 260 N/A psi at max. temp. 150 N/A ° F Min. design metal temp. -49 ° F at 260 psi.
(internal) (external) (internal) (external)

10. Impact test Yes, As Per UG-84, Shell, N1 & N2 Flanges
(Indicate yes or no and the component(s) impact tested)

11. Hydro., pneu., or comb. test press 390 PSIG Proof test Hydrotest

Items 12 and 13 to be completed for tube sections.

12. Tubesheet: SA-516-70N (2 Pieces) 6.065/5.761" 1.250" 0.0625" Welded
Stationary (Mat'l Spec. No.) Dia., in (subject to press.) Nom. thk., in. Corr. Allow., in. Attachment (welded or bolted)
N/A N/A N/A N/A N/A
Floating (Mat'l Spec. No.) Dia., in. Nom. thk., in. Corr. Allow., in. Attachment

13. Tubes: SA-179 0.75" 14 BWG 27 Straight
Mat'l Spec. No., Grade or Type O. D., in. Nom. thk., in. or gauge Number Type (Straight or U)

Items 14 - 18 incl. to be completed for inner chambers of jacketed vessels or channels of heat exchangers.

14. Shell (a) No. of course(s): 2 (b) Overall length (ft & in.): 1'-0" S/F

Course(s)			Material	Thickness		Long. Joint (Cat. A)			Circum. Joint (Cat. A, B & C)			Heat Treatment	
No.	Diameter, in.	Length (ft. & in.)	Spec./Grade or Type	Nom.	Corr.	Type	Full, Spot, None	Eff.	Type	Full, Spot, None	Eff.	Temp.	Time
1	5.761"ID	7 1/8"	SA-333-6	0.432"	0.0625"	Sml's Pipe	N/A	100	Sgl"V"	CS:Spot	100	N/A	N/A
2	5.761"ID	7 1/8"	SA-333-6	0.432"	0.0625"	Sml's Pipe	N/A	100	Sgl"V"	CS:Spot	100	N/A	N/A

15. Heads: (a)							(b)							
SA-350-LF2 N/A							SA-350-LF2 N/A							
(Mat'l Spec. No., Grade or Type) H.T. - Time & Temp.														
	Location (Top, Bottom, Ends)	Thickness		Radius		Elliptical	Conical	Hemispherical	Flat	Side to Pressure		Category A		
		Min.	Corr.	Crown	Knuckle	Ratio	Apex Angle	Radius	Diameter	Convex	Concave	Type	Full, Spot, None	Eff.
(a)	End			6"	Diameter-	600#	Blind	Flange						
(b)	End			6"	Diameter-	600#	Blind	Flange						

If removable, bolts used (describe other fastening) Each End: SA-320-L7, 1" Diameter, (12)
(Mat'l Spec. No., Grade, Size, No.)

6. MAWP 1300 N/A psi at max temp. 150 N/A ° F Min. design metal temp. -45 ° F at 1300 psi.
(internal) (external) (internal) (external)

7. Impact test Yes, As Per UG-84, Channels, N3 & N4 Flanges
(Indicate yes or no and the component(s) impact tested)

8. Hydro., pneu., or comb. test pressure 1950 PSIG Proof test Hydrotest

9. Nozzles, inspection, and safety valve openings:

Pu. Outlet, Drain, etc.)	Inlet, No.	Diameter or Size	Flange Type	Material		Nozzle Thickness		Reinforcement Material	How Attached		Location (Insp. Open.)
				Nozzle	Flange	Nom.	Corr.		Nozzle	Flange	
N1	1	2"	RFWN	SA-333-6	SA-350-LF2	0.218"	0.0625"	N/A	JW-16.1(c)	Welded	Shell
N2	1	2"	RFWN	SA-333-6	SA-350-LF2	0.218"	0.0625"	N/A	JW-16.1(c)	Welded	Shell
N3	1	2"	RFWN	SA-333-6	SA-350-LF2	0.344"	0.0625"	N/A	JW-16.1(c)	Welded	Channel
N4	1	2"	RFWN	SA-333-6	SA-350-LF2	0.344"	0.0625"	N/A	JW-16.1(c)	Welded	Channel
C1	1	3/4"	LG CPLG	SA-350-LF2	N/A	6000#	0.0625"	N/A	JW-16.1(c)	N/A	Channel
C2	1	3/4"	LG CPLG	SA-350-LF2	N/A	6000#	0.0625"	N/A	JW-16.1(c)	N/A	Channel

10. Supports: Skirt No Lugs Legs Others Shoes Attached Welded
(Yes or No.) (No.) (No.) (Describe) (Where and How)

11. Manufacturer's Partial Data Reports properly identified and signed by Commissioned Inspectors have been furnished for the following items of the report:
(List the name of part, item number, mfg's. name and identifying number)

22. Remarks: 6 5/8"OD x 20'-0" TS/TS, Propane Subcooler "E-650"
Capacity: 3.42 Cu Ft
Heating Surface: 105.84 Sq Ft. PSV: On Piping
registered Drawing No.: Alberta: 9037-0220-212/Rev.0, British Columbia: 9097-0850-211/Rev.0

CERTIFICATE OF SHOP COMPLIANCE

We certify that the statements made in this report are correct and that all details of design, material, construction, and workmanship of this vessel conform to the ASME Code for Pressure Vessels, Section VIII, Division 1.

U Certificate of Authorization No. 22,145 Expires August 22, 19 99
Date 98-03-23 Name THERMO DESIGN ENGINEERING LTD. Signed Bill Macie
(Manufacturer) (Representative)

CERTIFICATE OF SHOP INSPECTION

I, the undersigned, holding a valid commission issued by The National Board of Boiler and Pressure Vessel Inspectors and the State or Province of AB and employed by Alberta Boilers' Safety Association of in Edmonton have inspected the pressure vessel described in this Manufacturer's Data Report on March 23, 19 98, and state that, to the best of my knowledge and belief, the Manufacturer has constructed this pressure vessel in accordance with ASME Code, Section VIII, Division 1. By signing this certificate neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the pressure vessel described in this Manufacturer's Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.
Date 98-3-23 Signed L. Hapala Commissions 398
(Authorized Inspector) (Nat'l Board incl. endorsement, State, Province and No.)

CERTIFICATE OF FIELD ASSEMBLY COMPLIANCE

We certify that the statements on this report are correct and that the field assembly construction of all parts of this vessel conforms with the requirements of ASME Code, Section VIII, Division 1.

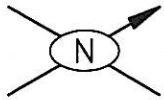
U Certificate of Authorization No. Expires , 19
Date Name Signed
(Assembler) (Representative)

CERTIFICATE OF FIELD ASSEMBLY INSPECTION

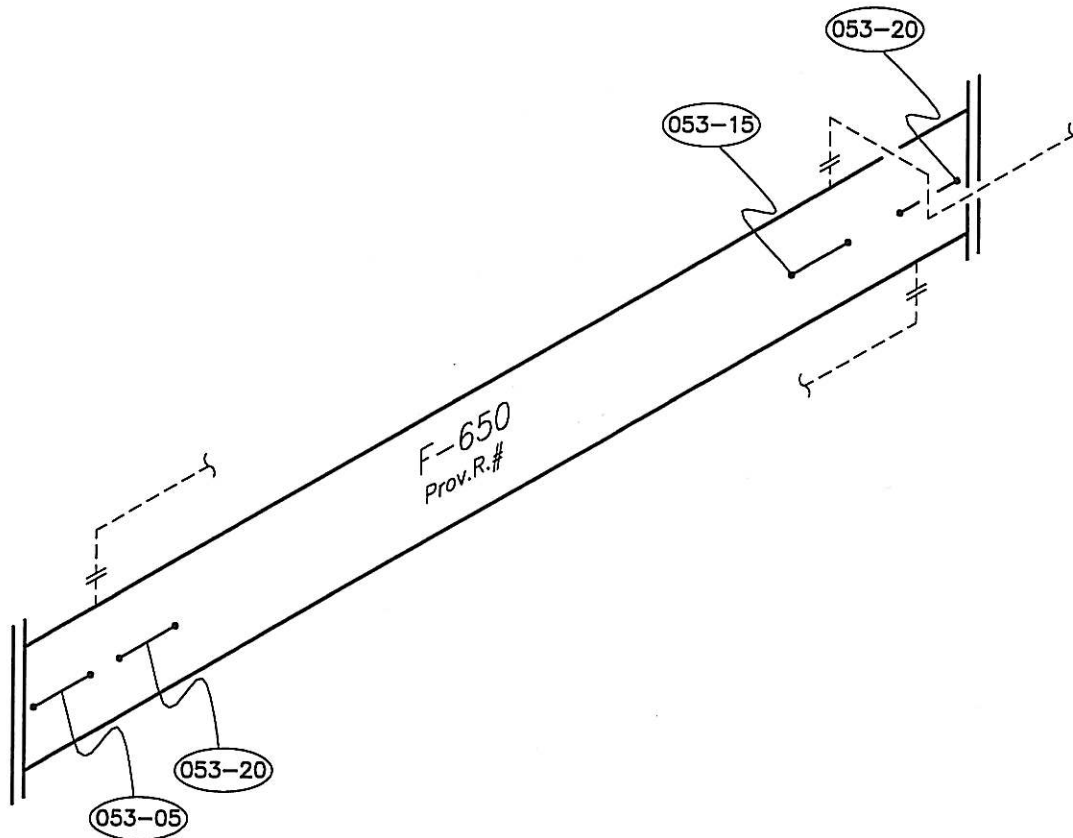
I, the undersigned, holding a valid commission issued by The National Board of Boiler and Pressure Vessel Inspectors and the State or Province of and employed by of have compared the statements in this Manufacturer's Data Report with the described pressure vessel and state that parts referred to as data items , not included in the certificate of shop inspection, have been inspected by me and to the best of my knowledge and belief, the Manufacturer has constructed and assembled this pressure vessel in accordance with ASME Code, Section VIII, Division 1. The described vessel was inspected and subjected to a hydrostatic test of psi. By signing this certificate neither the Inspector nor his employer makes any warranty, expressed or implied, concerning the pressure vessel described in this Manufacturer's Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.
Date Signed Commissions
(Authorized Inspector) (Nat'l Board incl. endorsement, State, Province and No.)



TESTING INC.



P&ID. # _____
REF. # _____



VESSEL DATA

P.E. No. F-650 Serial No. 1624 Prov. Reg. No. A C.R.N. N7421.21
MFR. THERMO DESIGN Code/Div. _____ Para _____ Code Stamp U
Yr. Bld. 1998 Yr. Inst. _____ Size 6.625" x 20' Service _____ PWHT _____
RT RT-2 Insulated YES

Nominal Thickness & Material

Head: 600# FLG. Mat'l: SA 350L C.A. 0.625" (1.6mm) Reason _____
Head: _____ Reason _____

Shell: .280" SA 333 G

Shell: _____

Chan Hd: _____

Chan Sh: _____

Boot Hd: _____

Boot Sh: _____

MAWP Shell Side 260PSI @ Temp. -49/150°F

MAWP Tube Side 1300PSI @ Temp. -49/150°F

COMMENTS: _____

PIONEER NATURAL RESOURCES CANADA INC.
CHINCHAGA GAS PLANT
LSD C-32-H / 94-H-8

PROPANE SUBCOOLER

TECH.: J.O.	REV. DATE:	DWG DATE: 99/08
CAD: WO	REVISION:	DRAWING: 053

**PIONEER NATURAL RESOURCES CANADA INC.
CHINCHAGA GAS PLANT**

RIVEST TESTING INC.

Item Desc.: C-32-H/94-H-8 / PROPANE SUBCOOLER
Equip. No.: F-650 Ser. No.: 1624

Prov. Reg.: N/A

Pt.Desc.: S.CHAN.SHELL

Point No.: 053-05

Nominal: 11.100 Mths. Rem. To Min. Nom:
Corr. Allowance: 1.600 Min. Cal. Wall Thk.:
Min. Nominal: 9.500

Good For Continued Service: YES
Additional Assessment Of Data: YES
Suggested Max Insp. Interval In Mths.: 12

Survey Dates: 1999-12
Data Readings
1 11.000 _____.
2 11.300 _____.
3 11.300 _____.
4 11.000 _____.
5 11.300 _____.
6 11.600 _____.
_____.

Data Evaluation

Lowest Reading : 11.000
Average - Low 3 : 11.100
Thk.Remaining Above Min. : 1.500
Indv. Short Term Rate (mm/yr) :
Short Term Rate (mm/yr) :
LongTerm Rate (mm/yr) :

Pt.Desc.: S.SHELL

Point No.: 053-10

Nominal: 7.100 Mths. Rem. To Min. Nom:
Corr. Allowance: 1.600 Min. Cal. Wall Thk.:
Min. Nominal: 5.500

Good For Continued Service: YES
Additional Assessment Of Data: YES
Suggested Max Insp. Interval In Mths.: 12

Survey Dates: 1999-12
Data Readings
1 7.300 _____.
2 7.300 _____.
3 7.100 _____.
4 7.100 _____.
5 7.300 _____.
6 7.300 _____.
_____.

Data Evaluation

Lowest Reading : 7.100
Average - Low 3 : 7.167
Thk.Remaining Above Min. : 1.600
Indv. Short Term Rate (mm/yr) :
Short Term Rate (mm/yr) :
LongTerm Rate (mm/yr) :

PIONEER NATURAL RESOURCES CANADA INC.
CHINCHAGA GAS PLANT

RIVEST TESTING INC.

Item Desc.: C-32-H/94-H-8 / PROPANE SUBCOOLER
Equip. No.: F-650 Ser. No.: 1624

Prov. Reg.: N/A

Pt.Desc.: N.SHELL

Point No.: 053-15

Nominal: 7.100 Mths. Rem. To Min. Nom:
Corr. Allowance: 1.600 Min. Cal. Wall Thk.:
Min. Nominal: 5.500

Good For Continued Service: YES
Additional Assessment Of Data: YES
Suggested Max Insp. Interval In Mths.: 12

Survey Dates: 1999-12
Data Readings
1 7.400 _____.
2 7.400 _____.
3 7.400 _____.
4 7.200 _____.
5 7.200 _____.
6 7.300 _____.
_____.

Data Evaluation

Lowest Reading : 7.200
Average - Low 3 : 7.233
Thk.Remaining Above Min. : 1.700
Indv. Short Term Rate (mm/yr) :
Short Term Rate (mm/yr) :
LongTerm Rate (mm/yr) :

Pt.Desc.: N.CHAN.SHELL

Point No.: 053-20

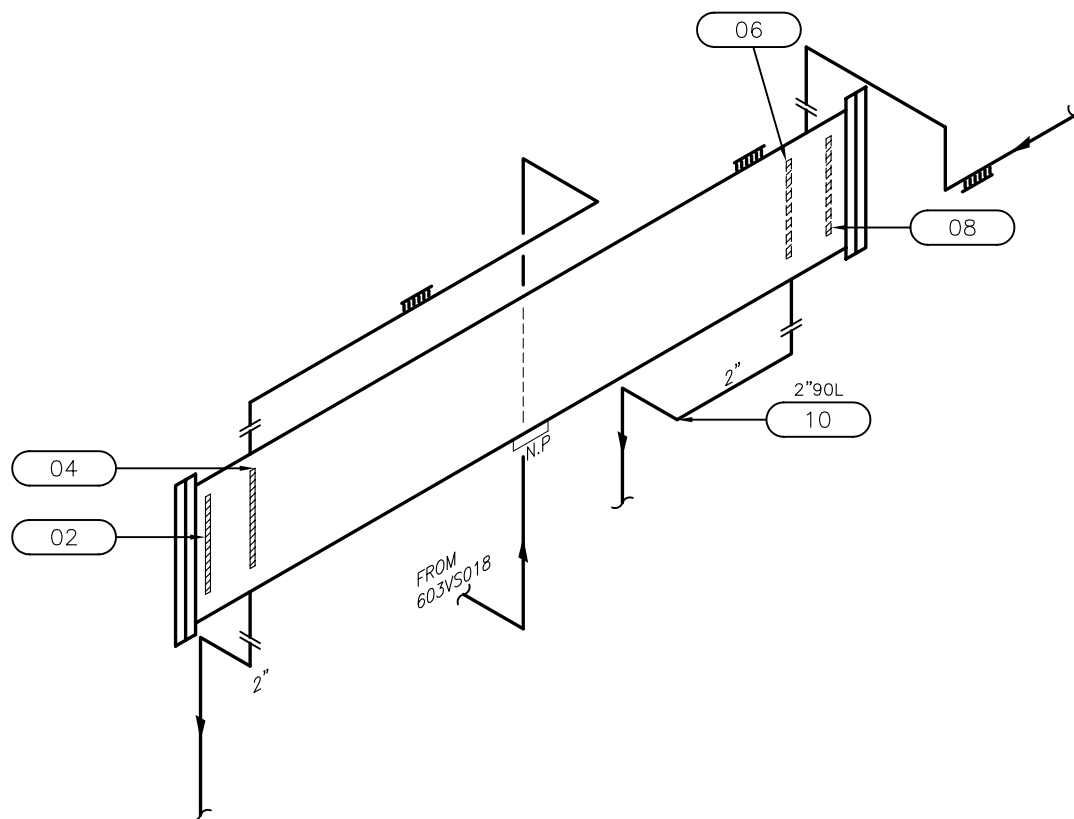
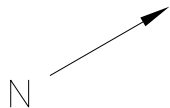
Nominal: 11.100 Mths. Rem. To Min. Nom:
Corr. Allowance: 1.600 Min. Cal. Wall Thk.:
Min. Nominal: 9.500

Good For Continued Service: YES
Additional Assessment Of Data: YES
Suggested Max Insp. Interval In Mths.: 12

Survey Dates: 1999-12
Data Readings
1 11.000 _____.
2 11.300 _____.
3 11.300 _____.
4 11.300 _____.
5 11.400 _____.
6 11.300 _____.
_____.

Data Evaluation

Lowest Reading : 11.000
Average - Low 3 : 11.200
Thk.Remaining Above Min. : 1.500
Indv. Short Term Rate (mm/yr) :
Short Term Rate (mm/yr) :
LongTerm Rate (mm/yr) :



Integrity Testing
SERVICES

P.E. No.: N/S Yr. Blt.: 1998
OIP# 603HT005 Manway: NO
Serial No.: 1624 Size: 168mm x 6096mm
P.R.N. ④ N/S Service: SWEET
C.R.N.: N7421.21 PWHT: NO
Code/Div.: ASME VIII DIV. 1 RT: 2
Para: N/S Insulated: LOW TEMP
C. Stamp: UW N.B. No: N/S
Manufacturer: THERMO DESIGN LTD.

Design & Materials Data

HEAD	SHELL
Material: <u>SA-350-LF2</u>	Material: <u>SA-333-6</u>
Nom.: <u>N/S</u>	Nom.: <u>7.1mm</u>
C.A.: <u>1.6mm</u>	C.A.: <u>1.6mm</u>
BOOT HEAD	BOOT SHELL
Material: _____	Material: _____
Nom.: _____	Nom.: _____
C.A.: _____	C.A.: _____
CHANNEL HEAD	CHANNEL SHELL
Material: _____	Material: _____
Nom.: _____	Nom.: _____
C.A.: _____	C.A.: _____
MAWP Shell Side: <u>1793 KPA</u>	⊗ Temp.: <u>66°C</u>
MAWP Tube Side: _____	⊗ Temp.: _____

CLIENT

TAQA NORTH

FACILITY

CHINCHAGA GAS PLANT

LSD C-032-H/094-H-08

ITEM

PROPANE SUBCOOLER

Comments: _____

BY: M.T.

DATE: 2008/04

DWG.# 019

TAQA North

Unit: N-603

FACILITY:	CHINCHAGA GAS PLANT	MANUFACTURER:	THERMO DESIGN ENGINEER
LSD:	C-032-H/094-H-08	DESIGN PRESSURE:	1793 kPa / 260 psi
ITEM DESC.:	PROPANE SUBCOOLER	DESIGN TEMP.:	66 C / 151 F
EQUIP / OIP#:	603HT005	RECOMMENDED NEXT INSP. DATE:	05/2012
PROV. REG. #:	N/S	RECOMMENDED RETIREMENT DATE:	01/2178
SERIAL #:	1624	REM. LIFE (from last survey 04/2008):	169.80 yrs.
CRN.:	N7421.21	TOTAL CAUTION / ACTION TML:	0

Item # (019)

COMMENTS:

2008/04 - TML 8.01 READING IS CONFIRMED.

TML No.: 2 CHANNEL SIDE SH

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 11.43 mm.

MATERIAL:

MINIMUM THICKNESS MEASURED: 11.00 mm.

Pts.	Nom. Thick.	Corr. Allow.	Min. Thick.	B/L Survey Date mm/yyyy	B/L Survey Date mm/yyyy	Prev. Survey Date mm/yyyy	Prev. Survey Date mm/yyyy	Last Survey Date mm/yyyy	Last Survey Date mm/yyyy	Short Term Rate	Long Term Rate	TML Insp. Due	TML Retire. Date	Action/Caution Required Item
2.01	0.00	0.00	0.00	N/A	N/A	N/A	N/A	04/2008	11.40	0.000	0.000	04/2013	04/4008	NO
2.02	0.00	0.00	0.00	N/A	N/A	N/A	N/A	04/2008	11.00	0.000	0.000	04/2013	04/4008	NO
2.03	0.00	0.00	0.00	N/A	N/A	N/A	N/A	04/2008	11.10	0.000	0.000	04/2013	04/4008	NO
2.04	0.00	0.00	0.00	N/A	N/A	N/A	N/A	04/2008	11.40	0.000	0.000	04/2013	04/4008	NO
2.05	0.00	0.00	0.00	N/A	N/A	N/A	N/A	04/2008	11.90	0.000	0.000	04/2013	04/4008	NO
2.06	0.00	0.00	0.00	N/A	N/A	N/A	N/A	04/2008	11.80	0.000	0.000	04/2013	04/4008	NO

TML No.: 4 SIDE SH T-B

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 7.30 mm.

MATERIAL: SA333-6

MINIMUM THICKNESS MEASURED: 7.20 mm.

Pts.	Nom. Thick.	Corr. Allow.	Min. Thick.	B/L Survey Date mm/yyyy	B/L Survey Date mm/yyyy	Prev. Survey Date mm/yyyy	Prev. Survey Date mm/yyyy	Last Survey Date mm/yyyy	Last Survey Date mm/yyyy	Short Term Rate	Long Term Rate	TML Insp. Due	TML Retire. Date	Action/Caution Required Item
4.01	7.10	1.60	5.50	01/1998	7.10	N/A	N/A	04/2008	7.20	0.000	0.000	04/2013	12/2574	NO *
4.02	7.10	1.60	5.50	01/1998	7.10	N/A	N/A	04/2008	7.20	0.000	0.000	04/2013	12/2574	NO *
4.03	7.10	1.60	5.50	01/1998	7.10	N/A	N/A	04/2008	7.20	0.000	0.000	04/2013	12/2574	NO *
4.04	7.10	1.60	5.50	01/1998	7.10	N/A	N/A	04/2008	7.20	0.000	0.000	04/2013	12/2574	NO *
4.05	7.10	1.60	5.50	01/1998	7.10	N/A	N/A	04/2008	7.60	0.000	0.000	04/2013	04/2708	NO
4.06	7.10	1.60	5.50	01/1998	7.10	N/A	N/A	04/2008	7.40	0.000	0.000	04/2013	08/2641	NO

(*) and GREEN Represent 25% of the TMLs, which have the earliest retirement dates.

BLUE (Caution TML) Corrosion Rate greater than 0.250mm/yr. or TML Remaining Life is less than 1.00 year.

RED (Action TML) TML with negative life.

If Baseline Survey Thickness Measurement was not taken at the time of Manufacture, then Nominal Thickness is used as Baseline Thickness.

TAQA North

Unit: N-603

FACILITY:	CHINCHAGA GAS PLANT	MANUFACTURER:	THERMO DESIGN ENGINEER
LSD:	C-032-H/094-H-08	DESIGN PRESSURE:	1793 kPa / 260 psi
ITEM DESC.:	PROPANE SUBCOOLER	DESIGN TEMP.:	66 C / 151 F
EQUIP / OIP#:	603HT005	RECOMMENDED NEXT INSP. DATE:	05/2012
PROV. REG. #:	N/S	RECOMMENDED RETIREMENT DATE:	01/2178
SERIAL #:	1624	REM. LIFE (from last survey 04/2008):	169.80 yrs.
CRN.:	N7421.21	TOTAL CAUTION / ACTION TML:	0

Item # (019)

COMMENTS:

2008/04 - TML 8.01 READING IS CONFIRMED.

TML No.: 6 SIDE SH T-B

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 7.28 mm.

MATERIAL: SA333-6

MINIMUM THICKNESS MEASURED: 7.10 mm.

Pts.	Nom. Thick.	Corr. Allow.	Min. Thick.	B/L Survey Date mm/yyyy	B/L Survey Date mm/yyyy	Prev. Survey Date mm/yyyy	Prev. Survey Date mm/yyyy	Last Survey Date mm/yyyy	Last Survey Date mm/yyyy	Short Term Rate	Long Term Rate	TML Insp. Due	TML Retire. Date	Action/Caution Required Item
6.01	7.10	1.60	5.50	01/1998	7.10	N/A	N/A	04/2008	7.30	0.000	0.000	04/2013	04/2608	NO
6.02	7.10	1.60	5.50	01/1998	7.10	N/A	N/A	04/2008	7.30	0.000	0.000	04/2013	04/2608	NO
6.03	7.10	1.60	5.50	01/1998	7.10	N/A	N/A	04/2008	7.10	0.000	0.000	04/2013	08/2541	NO *
6.04	7.10	1.60	5.50	01/1998	7.10	N/A	N/A	04/2008	7.20	0.000	0.000	04/2013	12/2574	NO *
6.05	7.10	1.60	5.50	01/1998	7.10	N/A	N/A	04/2008	7.50	0.000	0.000	04/2013	12/2674	NO
6.06	7.10	1.60	5.50	01/1998	7.10	N/A	N/A	04/2008	7.30	0.000	0.000	04/2013	04/2608	NO

TML No.: 8 CHANNEL SH T-B

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 11.18 mm.

MATERIAL:

MINIMUM THICKNESS MEASURED: 11.00 mm.

Pts.	Nom. Thick.	Corr. Allow.	Min. Thick.	B/L Survey Date mm/yyyy	B/L Survey Date mm/yyyy	Prev. Survey Date mm/yyyy	Prev. Survey Date mm/yyyy	Last Survey Date mm/yyyy	Last Survey Date mm/yyyy	Short Term Rate	Long Term Rate	TML Insp. Due	TML Retire. Date	Action/Caution Required Item
8.01	0.00	0.00	0.00	N/A	N/A	N/A	N/A	04/2008	11.30	0.000	0.000	04/2013	04/4008	NO
8.02	0.00	0.00	0.00	N/A	N/A	N/A	N/A	04/2008	11.20	0.000	0.000	04/2013	04/4008	NO
8.03	0.00	0.00	0.00	N/A	N/A	N/A	N/A	04/2008	11.20	0.000	0.000	04/2013	04/4008	NO
8.04	0.00	0.00	0.00	N/A	N/A	N/A	N/A	04/2008	11.20	0.000	0.000	04/2013	04/4008	NO
8.05	0.00	0.00	0.00	N/A	N/A	N/A	N/A	04/2008	11.20	0.000	0.000	04/2013	04/4008	NO
8.06	0.00	0.00	0.00	N/A	N/A	N/A	N/A	04/2008	11.00	0.000	0.000	04/2013	04/4008	NO

(*) and GREEN Represent 25% of the TMLs, which have the earliest retirement dates.

BLUE (Caution TML) Corrosion Rate greater than 0.250mm/yr. or TML Remaining Life is less than 1.00 year.

RED (Action TML) TML with negative life.

If Baseline Survey Thickness Measurement was not taken at the time of Manufacture, then Nominal Thickness is used as Baseline Thickness.

TAQA North

Unit: N-603

FACILITY:	CHINCHAGA GAS PLANT	MANUFACTURER:	THERMO DESIGN ENGINEER
LSD:	C-032-H/094-H-08	DESIGN PRESSURE:	1793 kPa / 260 psi
ITEM DESC.:	PROPANE SUBCOOLER	DESIGN TEMP.:	66 C / 151 F
EQUIP / OIP#:	603HT005	RECOMMENDED NEXT INSP. DATE:	05/2012
PROV. REG. #:	N/S	RECOMMENDED RETIREMENT DATE:	01/2178
SERIAL #:	1624	REM. LIFE (from last survey 04/2008):	169.80 yrs.
CRN.:	N7421.21	TOTAL CAUTION / ACTION TML:	0

Item # (019)

COMMENTS:

2008/04 - TML 8.01 READING IS CONFIRMED.

TML No.: 10 2"90L N-W 600

DATE BUILT: 01/1998

AVERAGE THICKNESS MEASURED: 5.14 mm.

MATERIAL:

MINIMUM THICKNESS MEASURED: 5.00 mm.

Pts.	Nom. Thick.	Corr. Allow.	Min. Thick.	B/L Survey Date mm/yyyy	B/L Survey Date mm/yyyy	Prev. Survey Date mm/yyyy	Prev. Survey Date mm/yyyy	Last Survey Date mm/yyyy	Last Survey Date mm/yyyy	Short Term Rate	Long Term Rate	TML Insp. Due	TML Retire. Date	Action/Caution Required Item
10.01	5.50	0.70	4.80	01/1998	5.50	N/A	N/A	04/2008	5.20	0.000	0.030	04/2013	05/2021	NO *
10.02	5.50	0.70	4.80	01/1998	5.50	N/A	N/A	04/2008	5.10	0.000	0.038	03/2012	02/2016	NO *
10.03	5.50	0.70	4.80	01/1998	5.50	N/A	N/A	04/2008	5.00	0.000	0.048	05/2010	05/2012	NO *
10.04	5.50	0.70	4.80	01/1998	5.50	N/A	N/A	04/2008	5.40	0.000	0.010	04/2013	04/2067	NO *
10.05	5.50	0.70	4.80	01/1998	5.50	N/A	N/A	04/2008	5.00	0.000	0.048	05/2010	05/2012	NO *

(*) and GREEN Represent 25% of the TMLs, which have the earliest retirement dates.

BLUE (Caution TML) Corrosion Rate greater than 0.250mm/yr. or TML Remaining Life is less than 1.00 year.

RED (Action TML) TML with negative life.

If Baseline Survey Thickness Measurement was not taken at the time of Manufacture, then Nominal Thickness is used as Baseline Thickness.

DETAIL VESSEL AND PIPING INSPECTION REPORT

(Imperial)

GENERAL PRESSURE VESSEL INFORMATION

Company:	Pioneer Natural Resources Canada Inc.	LSD:	BC	C-32-H/94-H-8
Area/Facility:	Chinchaga Gas Plant	Inspection Date	06-Feb-02	Interval: 2 yrs
Vessel Name:	Propane Sub Cooler	A No:	BC	MTL No: VSL207
Internal Coating Type:		Next External:	2/6/2003	Next Internal: Feb, 2004
Vessel Orientation:	Horizontal	Internal Coating Lining:	0	
Vessel Type:	Horizontal Vessel	Fluid Type:		
Tag No:	E-650	Serial Number:	1624	
Separator Type:		Business Unit:		
Direct Fired Vessel:	N/A	Fired Tube:		Cost Centre:
Current Status:	In Service	Flame Arrester Date Required:		Date
Thermal Insulation:	Yes	Asbestos:	No	

PRESSURE VESSEL NAMEPLATE INFORMATION

MTL Number:	VSL207	Volume:	3.420 F3	CRN Number:	N-7421.21	Registered:	No
Serial Number:	1624	Size:	6.625 in O.D. x 20 ft 0 in	Seam to Seam			
Drawing Number:	9097-0850-211	P & ID Number:					
Shell Material:	SA-333-6	Bottom	Shell Thickness:	0.280 In			
		Top	Shell Thickness:	0.280 In			
Head Material:	SA-350-LF2		Head Thickness:	In			
			Head Thickness:	In			
Tube Material:	SA-179	Tube Size(OD):	1.25 In	Tube Thickness:	1.250 In		
Tubesheet Material:		Tubesheet Thickness:	In				
Channel Material:		Channel Type:		Channel Thickness:	In		
Design Pressure:	Shell: 260 psi	Operating Pressure:	Shell: psi				
	Tube: 1300 psi		Tube: psi				
Design Temperature:	Shell: 150 F	Operating Temperature:	Shell: F				
	Tube: 150 F		Tube: F				
RT (XRay):	RT2	Heat Treatment:	No				
Code Parameters:		Joint Efficiency:					
Manufacturer:	Thermo Design Engineering	Year Built:	1998				
Corrosion Allowance:	0.063	Manway:	No				

DETAIL VESSEL AND PIPING INSPECTION REPORT

(Imperial)

GENERAL PRESSURE VESSEL INFORMATION

Company:	Pioneer Natural Resources Canada Inc.	LSD:	BC	C-32-H/94-H-8
Area/Facility:	Chinchaga Gas Plant	Inspection Date	06-Feb-02	Interval: 2 yrs
Vessel Name:	Propane Sub Cooler	A No:	BC	MTL No: VSL207

VESSEL SHELL / HEADS / PIPING

External / Instrumentation Condition

The external surface of this vessel was insulated and clad. There was no access to bonnets or tubeside. The associated instrumentation appeared to be in good working order.

Internal Condition

No internal access

Nozzle Condition

The external surface of the nozzle assemblies and associated welds were painted with no signs of external corrosion.

Flange Condition

The flanges are bolted properly and there was no visible evidence of leakage.

Internal Piping

Not Applicable

External Piping

The external piping was half insulated and painted. The shellside paint was starting to fail but there was no visible evidence of corrosion.

Pipe Support Condition

The associated pipe supports were in good condition with no evidence of any mechanical damage or degradation.

Bolting Condition

The associated bolting and gaskets were in place and appeared to be tight.

Firetube Condition

Not Applicable

Demister Pad Condition

Not Applicable

Anode Condition

Not Applicable

Vessel Support

The exchanger supports were noted in good condition.

DETAIL VESSEL AND PIPING INSPECTION REPORT

(Imperial)

GENERAL PRESSURE VESSEL INFORMATION

Company:	Pioneer Natural Resources Canada Inc.	LSD:	BC	C-32-H/94-H-8
Area/Facility:	Chinchaga Gas Plant	Inspection Date	06-Feb-02	Interval: 2 yrs
Vessel Name:	Propane Sub Cooler	A No:	BC	MTL No: VSL207

VESSEL COATING INSPECTION

Type of Coating

Coating Manufactuer and Type

Location

Coating Condition

VESSEL NONDESTRUCTIVE TESTING

NDE Type		UT Survey	
Location of Test			
Contractors Name		Rivest	Qualifications
Last UT Survey Date		Interval	2 yrs
Survey By		Next UT Date:	
Test Results			

VESSEL STATUS

Suitable for Further Service?	Yes	Repairs Required?	No
Owners Representative		Repairs Completed?	
Owners Date		Repairs Completed By	
		Repair Date	

Recommendations

Next external inspection in 3 years
Service PSV in 3 years
Repeat UT Survey in 3 years

Details of Repairs

DETAIL VESSEL AND PIPING INSPECTION REPORT

(Imperial)

GENERAL PRESSURE VESSEL INFORMATION

Company:	Pioneer Natural Resources Canada Inc.	LSD:	BC	C-32-H/94-H-8
Area/Facility:	Chinchaga Gas Plant	Inspection Date	06-Feb-02	Interval: 2 yrs
Vessel Name:	Propane Sub Cooler	A No:	BC	MTL No: VSL207

PSV DATA

Side	Set Pressure psi	CRN Number	Manufacturer PSV Number	Model Serial Number	Capacity	Size Inches	Set Date
Shellside	1000	W-15693	Crosby PNR4081	JOS 45/A SE-17092-5	25662 SCFM	2.5 x 4	Dec/1999
Shellside	1000		Crosby PNR4281	JOS 45A SE-17093-5	25662 SCFM	2.5 x 4	Dec/1999
Shellside	260		Farris PNR6451	26-LA-10-120 43975-5-A10	14970 SCFM	3 x	Dec/1999

CURRENT VESSEL PROCESS CONDITIONS

Sweet Gas	LPG
-----------	-----

Name (Printed)	Signature	Date
Visual Inspector Paul Gorman API510	<i>Alvise for Paul Gorman</i>	February 06, 2002
QA Supervisor: (Chief Inspector)		
QA Administrator:		
ABSA Inspector:		

EQUIPMENT NO: 603HT005

Page of

FACILITY: Chinchaga Gas Plant

PROV. REG. NO:

EQUIPMENT NAME: Propane Subcooler

TAG NO:

SIZE: 168mm OD x 6096mm L/H

MAWP: 1793 kPa @ 66/-45 °C

LSD : C-032-H / 094-H-08

MANWAY ☐ YES ☒ NO

SERVICE:

FLUID: Propane

☐ SOUR ☒ SWEET ☐ CRYOGENIC

SCOPE OF INSPECTION

TYPE OF INSPECTION:

CLEANING:

ACCESS:

☐ PRECOMMISSIONING

☐ AE

☐ MT

☐ RT

☒ GOOD

☐ FULL

☒ INITIAL

☐ ET

☐ MFL

☒ UT

☐ FAIR

☐ PARTIAL

☐ REINSPECTION

☐ LT

☐ PT

☒ VT

☐ INADEQUATE

☒ EXTERNAL

☐ OTHER

PLEASE ADD PAGES AND SKETCHES AS NEEDED (TURN OVER FOR SKETCH)

OBSERVATIONS:

☒ EXTERNAL

1. LADDERS, STAIRWAYS, PLATFORMS AND WALKWAYS ☒

2. FOUNDATIONS AND SUPPORTS ☒

3. NOZZLES ☒

4. GROUNDING CONNECTIONS ☒ Skid is grounded, subcooler is welded to I-beam

5. PROTECTIVE COATINGS AND INSULATION ☒

6. EXTERNAL METAL SURFACES ☒ I-beam

7. FANS AND OTHER ANCILLARY EQUIPMENT ☐ N/A

8. PRESSURE RELIEF DEVICES ☒ Two PSV

9. NAME PLATE ☒

10. ULTRASONIC INSPECTION SURVEY ☒

11. INSPECTION REPORT COMPLETED ☒

12. NON CONFORMANCE COMPLETED ☐ N/A

13. OIP LABEL APPLIED ☒

14. PICTURE ON FILE ☒

COMMENTS

CHECKED BOX INDICATES ACCEPTANCE

RECOMMENDATIONS:

SUITABLE FOR

REMEDIAL ACTION

FURTHER SERVICE: ☒ YES ☐ NO

PRIORITY: ☐ HIGH ☐ MEDIUM ☐ LOW

INSPECTION PERFORMED BY: Mark Tomko

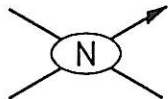
DATE OF INSPECTION 07 04 2008
(DD MONTH YYYY)

FOLLOW-UP INSPECTION REQ'D:

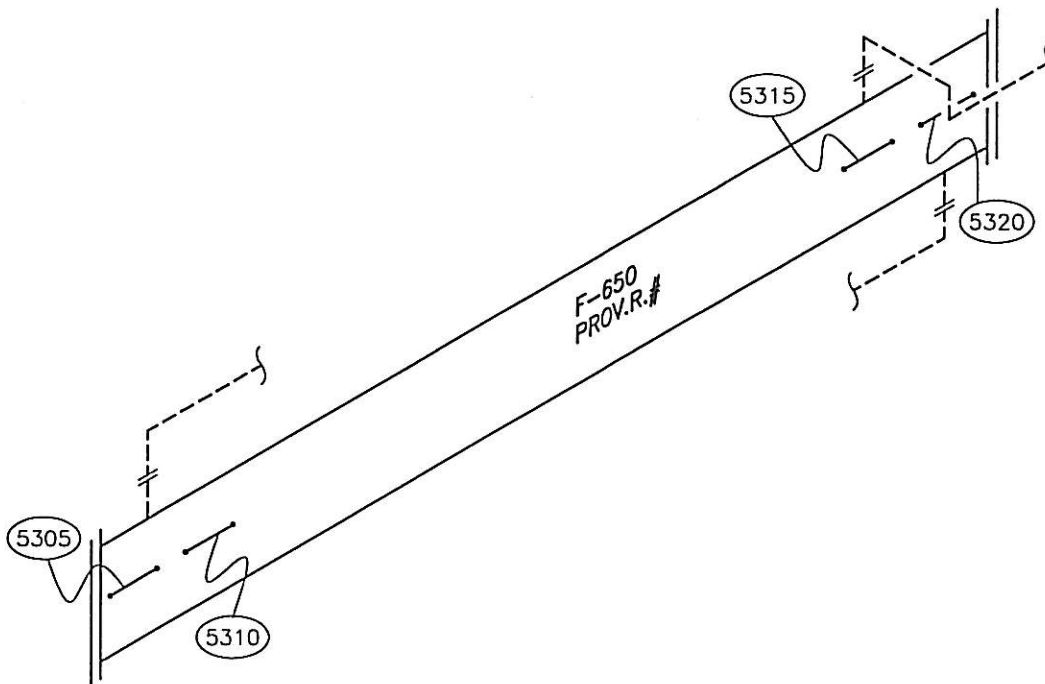
☐ YES ☒ NO

BY DATE:

(DD MONTH YYYY)



P&ID. # _____
REF. # _____



VESSEL DATA

Prov. Reg. No. _____ C.R.N. N 7421.21 P.E. No. F-650 Serial No. 1624
MFR. THERMO DESIGN Code/Div. _____ Para _____ Code Stamp U
Yr. Bld. 1998 Yr. Inst. _____ Size 6.625"ØX20' Vol.: _____ Service _____ PWHT _____

Nominal Thickness & Material

Head: 600# FLG. Mat'l: SA 350L C.A.: 1.6mm
Head: _____
Shell: 0.280" SA 333 G C.A.: _____
Shell: _____
Chan Hd: _____ C.A.: _____
Chan Sh: _____
Gas Boot Hd: _____ C.A.: _____
Gas Boot Sh.: _____
Liq. Boot Hd.: _____ C.A.: _____
Liq Boot Sh.: _____

Insulated YES R.T. 2

Repairs _____
COMMENTS _____

PIONEER NATURAL RESOURCES CANADA INC.
CHINCHAGA GAS PLANT
LSD C-32-H \ 94-H-8

PROPANE SUBCOOLER

MAWP Shell Side 260psi @ Temp. -49/150°F
MAWP Tube Side 1300psi @ Temp. -49/150°F

TECH.: J.OLIVER	REV.DATE:	DWG DATE: 02/2002
CAD: MKM	REVISION:	DRAWING: 053

Equip No F-650

Serial No 1624

Prov Reg No N/A

Description PROPANE SUBCOOLER

053 - 005

TML Description: S. CHAN. SHELL

T Nominal: 11.1

Min Nominal: 9.5

Corr Allowance: 1.6

*Data Readings**Data Evaluations*

Months Remaining to T Min: 364
 Min Calc'd Wall Thickness: N/A
 Thick Remain Above T Min: 1.4
 Short Term Corr Rate: N/A
 Long Term Corr Rate: N/A
 Months Remain to LFL: N/A
 Lowest Value - Last Reading: 10.9

Comment:

	Dec-99	Feb-02
Point 1	11.0	11.0
Point 2	11.3	11.2
Point 3	11.3	11.1
Point 4	11.0	10.9
Point 5	11.3	10.9
Point 6	11.6	11.2
Point 7		
Point 8		
Point 9		
Point 10		
Point 11		
Point 12		
Average	11.3	11.1
Avg Low 3	11.1	10.9
Lowest	11.0	10.9

053 - 010

TML Description: S. SHELL

T Nominal: 7.1

Min Nominal: 5.5

Corr Allowance: 1.6

*Data Readings**Data Evaluations*

Months Remaining to T Min: 999
 Min Calc'd Wall Thickness: N/A
 Thick Remain Above T Min: 1.6
 Short Term Corr Rate: N/A
 Long Term Corr Rate: N/A
 Months Remain to LFL: N/A
 Lowest Value - Last Reading: 7.1

Comment:

	Dec-99	Feb-02
Point 1	7.3	7.3
Point 2	7.3	7.3
Point 3	7.1	7.1
Point 4	7.1	7.2
Point 5	7.3	7.2
Point 6	7.3	7.3
Point 7		
Point 8		
Point 9		
Point 10		
Point 11		
Point 12		
Average	7.2	7.2
Avg Low 3	7.2	7.2
Lowest	7.1	7.1

053 - 015

TML Description: N. SHELL			
T Nominal: 7.1			
Min Nominal: 5.5			
Corr Allowance: 1.6			
<i>Data Readings</i>			
<i>Data Evaluations</i>		Dec-99	Feb-02
Months Remaining to T Min:	999	Point 1	7.4 7.5
Min Calc'd Wall Thickness:	N/A	Point 2	7.4 7.5
Thick Remain Above T Min:	1.7	Point 3	7.4 7.5
Short Term Corr Rate:	N/A	Point 4	7.2 7.3
Long Term Corr Rate:	N/A	Point 5	7.2 7.2
Months Remain to LFL:	N/A	Point 6	7.3 7.2
Lowest Value - Last Reading:	7.2	Point 7	
Comment:		Point 8	
		Point 9	
		Point 10	
		Point 11	
		Point 12	
		Average	7.3 7.4
		Avg Low 3	7.2 7.2
		Lowest	7.2 7.2

053 - 020

TML Description: N. CHAN. SHELL			
T Nominal: 11.1			
Min Nominal: 9.5			
Corr Allowance: 1.6			
<i>Data Readings</i>			
<i>Data Evaluations</i>		Dec-99	Feb-02
Months Remaining to T Min:	999	Point 1	11.0 11.1
Min Calc'd Wall Thickness:	N/A	Point 2	11.3 11.3
Thick Remain Above T Min:	1.6	Point 3	11.3 11.1
Short Term Corr Rate:	N/A	Point 4	11.3 11.1
Long Term Corr Rate:	N/A	Point 5	11.4 11.3
Months Remain to LFL:	N/A	Point 6	11.3 11.3
Lowest Value - Last Reading:	11.1	Point 7	
Comment:		Point 8	
		Point 9	
		Point 10	
		Point 11	
		Point 12	
		Average	11.3 11.2
		Avg Low 3	11.2 11.1
		Lowest	11.0 11.1

RAM#	433856	EQUIP STATIC RECORD		JOB#	1-2968
Unique OUP #:	603HT005	Old OUP #:		LSD:	C-032-H/094-H-08

TANK M/WAY OD FLANGE DIMENSIONS: _____ x _____ mm OR IF M/WAY IS ROUND, DIA. IS: _____ mm

TK. HEATED: _____ TYPE OF HEAT: _____ TK. SKIDDED or PORTABLE: _____ GAS BLANKET: _____ DOUBLE WALL: _____

TK. CONSTRUCTION: _____ TANK DYKED: _____ DYKE MATERIAL: _____ Leak Tag#: _____

DYKE LINED: _____ TYPE of LINER: _____ Leak Test Co. _____ Leak Test Date _____

DYKE SHAPE: _____ mm Width: _____ mm Height: _____ mm

DYKE VOLUME: _____ m³ TK. BASE SITTING ON: _____ BETWEEN TK. AND BASE: _____

TANKS INSIDE DYKE: _____

P&ID #: _____ SHUT DOWN: _____

OPERATING PRESSURE: _____ kPa OPERATING TEMP. **17** °C YEAR PUT IN SERVICE: _____

VESSEL CONNECTIONS: NPT _____ FLANGE Yes LARGEST CONNECTION _____ mm INSPECTION PORT: Hand Hole

FLANGE ANSI: **300** FLG. FACE: _____ SIZE of INSPECTION PORT: **168.3** mm

VESSEL ORIENTATION: Horizontal TYPE OF VESSEL SUPPORT: Saddle IS BOTTLE (VB) BLOCKED: _____

TRAY(VT): _____ # of TRAYS _____ MAT'L _____ MFG. _____

PACKING(VK): _____ EXT. INSULATED: _____ Full or Partially covered? _____

INSULATION TYPE: Cold CLADDING: SS

TYPE of EXT. INSULATION: _____ EXT. INSULATION THICKNESS: **40.0** mm CUI Susceptible: _____

EXT. COATING: Epoxy INTERNAL COATING: _____ INTER. LINING: _____

PRESSURE RELIEF DATA

PSV OUP#	SET PRESSURE	units	CODE: SV, SR, ST, SL or ESD PROTECTS - TANK, SHELL, TUBE (HA or HT), HP coil, LP coil, FG coil, HS coil (heat string coil in line heater), PL, PP, Channel A or B in HP
603SVVS012	1793	kPa	Shell
603SVVS018	8963	kPa	Tube
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	

ITS
PRINT NAME: Murray Angus MacGregor

ITS
SIGNATURE:

DATE: data collected - yyyy-mm-dd 2014-Oct-18

EQUIPMENT EXTERNAL INSPECTION REPORT

Customer:	TAQA North	ITS Job No.:	1-2968
District:	North Area	Date:	18-Oct-2014
Facility:	Chinchaga Gas Plant	LSD:	C-032-H/094-H-08
Equip. Description:	Propane Sub Cooler	Serial No.:	1624
Equip./OIP No.:	603HT005	PRN:	Not Applicable
Equip. Type: <input type="checkbox"/> Column <input type="checkbox"/> Cooler <input type="checkbox"/> Exchanger <input type="checkbox"/> Furnace <input type="checkbox"/> Heater <input type="checkbox"/> Plate Exchanger <input type="checkbox"/> Reboiler <input checked="" type="checkbox"/> Vessel <input type="checkbox"/> Other:			

Remedial Action	Service	Associated Components	Shell
<input type="checkbox"/> No Action Required	<input checked="" type="checkbox"/> Sweet <input type="checkbox"/> Sour	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N: Name Plate Secure	<input type="checkbox"/> Good Condition
<input type="checkbox"/> Paint/Coating Repairs	Access and Coverage	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N: Name Plate Legible	<input type="checkbox"/> External Corrosion
<input type="checkbox"/> Insulation Repairs	<input checked="" type="checkbox"/> External Inspection	External Grounding	<input type="checkbox"/> Pitting: (max depth)
<input type="checkbox"/> PSV Service Required	<input type="checkbox"/> Part. External Inspection	<input type="checkbox"/> Direct <input checked="" type="checkbox"/> Indirect <input type="checkbox"/> N	<input type="checkbox"/> Scale
<input checked="" type="checkbox"/> Further Assessment Required	<input type="checkbox"/> Internal Inspection (VI) NDE Examination	<input type="checkbox"/> Y <input type="checkbox"/> N <input checked="" type="checkbox"/> NA: Ladders/ Handrail/ Walkway/ Grating in safe condition?	<input type="checkbox"/> Blistered
<input type="checkbox"/> Condition Damage	<input type="checkbox"/> UT		<input type="checkbox"/> Mechanical Damage
<input type="checkbox"/> Does not comply with applicable code/safe operating requirement.	<input type="checkbox"/> MT	<input type="checkbox"/> See Attached Pictures	<input type="checkbox"/> Deformation/Distortion
<input type="checkbox"/> Repairs Required	<input type="checkbox"/> PT	<input type="checkbox"/> Excessive Vibration	<input type="checkbox"/> Condensation/Sweating
<input checked="" type="checkbox"/> See Comments	<input type="checkbox"/> RT	<input type="checkbox"/> Y <input type="checkbox"/> N <input checked="" type="checkbox"/> NA: Pressure Gauge within MAWP	<input checked="" type="checkbox"/> No Access Insulated
Status	<input type="checkbox"/> BH		<input type="checkbox"/> No Access Ice Build Up
<input checked="" type="checkbox"/> Operational; <input type="checkbox"/> Idle;	<input type="checkbox"/> Other	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N <input type="checkbox"/> NA: Temp. Gauge within MDMT	<input type="checkbox"/> Weld(s) in Good Condition
<input type="checkbox"/> Shut In;	<input checked="" type="checkbox"/> See Comments	<input type="checkbox"/> Y <input checked="" type="checkbox"/> N Attached Piping and Instrumentation in Good Condition	<input type="checkbox"/> Weld(s) Corroded
<input type="checkbox"/> Surplus/Boneyard;		<input checked="" type="checkbox"/> See Comments	<input type="checkbox"/> Weld(s) Poor Quality
<input type="checkbox"/> Other:			<input type="checkbox"/> Weld(s) Cracked
			<input checked="" type="checkbox"/> See Comments

Head (1)	Head (2)	Nozzles
<input type="checkbox"/> Top <input checked="" type="checkbox"/> North <input type="checkbox"/> West	<input type="checkbox"/> Bottom <input checked="" type="checkbox"/> South <input type="checkbox"/> East	<input checked="" type="checkbox"/> RF <input type="checkbox"/> RTJ <input type="checkbox"/> NPT
<input type="checkbox"/> Flat <input checked="" type="checkbox"/> FLG <input type="checkbox"/> ELL <input type="checkbox"/> ECC <input type="checkbox"/> HEMI	<input type="checkbox"/> Flat <input checked="" type="checkbox"/> FLG <input type="checkbox"/> ELL <input type="checkbox"/> ECC <input type="checkbox"/> HEMI	<input type="checkbox"/> Good Condition
<input type="checkbox"/> Quick Actuating Closure	<input type="checkbox"/> Quick Actuating Closure	<input type="checkbox"/> Fasteners Engaged
<input type="checkbox"/> Good Condition	<input type="checkbox"/> Good Condition	<input type="checkbox"/> Repad Weep Holes Clear
<input type="checkbox"/> External Corrosion	<input type="checkbox"/> External Corrosion	<input type="checkbox"/> Nozzles are Gusseted
<input type="checkbox"/> Pitting: (max depth)	<input type="checkbox"/> Pitting: (max depth)	<input type="checkbox"/> External Corrosion
<input type="checkbox"/> Scale	<input type="checkbox"/> Scale	<input type="checkbox"/> Leaking/Weeping
<input type="checkbox"/> Blistered	<input type="checkbox"/> Blistered	<input type="checkbox"/> Damaged/Cracked
<input type="checkbox"/> Mechanical Damage	<input type="checkbox"/> Mechanical Damage	<input type="checkbox"/> Bolts Missing/Loose
<input type="checkbox"/> Deformation/Distortion	<input type="checkbox"/> Deformation/Distortion	<input type="checkbox"/> Deflection/Distortion
<input type="checkbox"/> Condensation/Sweating	<input type="checkbox"/> Condensation/Sweating	<input type="checkbox"/> Partial Internal Inspection
<input type="checkbox"/> No Access	<input type="checkbox"/> No Access	<input checked="" type="checkbox"/> No Access Insulated
<input checked="" type="checkbox"/> No Access Insulated	<input checked="" type="checkbox"/> No Access Insulated	<input type="checkbox"/> Weld(s) in Good Condition
<input type="checkbox"/> No Access Ice Build Up	<input type="checkbox"/> No Access Ice Build Up	<input type="checkbox"/> Weld(s) Corroded
<input type="checkbox"/> External Protection Only	<input type="checkbox"/> External Protection Only	<input type="checkbox"/> Weld(s) Poor Quality
<input checked="" type="checkbox"/> See Comments	<input checked="" type="checkbox"/> See Comments	<input type="checkbox"/> Weld(s) Cracked
		<input checked="" type="checkbox"/> See Comments

External Surface	Supports	Associated Piping	PRD 1	PRD 2
<input checked="" type="checkbox"/> Good Condition	<input checked="" type="checkbox"/> Good Condition	<input type="checkbox"/> Good Condition	Location: Outlet Piping on 603VS 012	Location: outlet piping on 603VS 018
<input type="checkbox"/> Painted <input type="checkbox"/> Full <input type="checkbox"/> Part.	<input type="checkbox"/> Anchor Bolts Secure	<input type="checkbox"/> Corrosion	PSV Tag No.: 603SVVS012	PSV Tag No.: 603SVVS018
<input type="checkbox"/> Coated <input type="checkbox"/> Full <input type="checkbox"/> Part.	<input checked="" type="checkbox"/> Welded to Skid	<input type="checkbox"/> Pitting: (max depth)	<input checked="" type="checkbox"/> Service Date within Interval	<input checked="" type="checkbox"/> Service Date within Interval
<input checked="" type="checkbox"/> Insulated <input checked="" type="checkbox"/> Full <input type="checkbox"/> Part.	<input type="checkbox"/> Supported by Nozzle(s)	<input type="checkbox"/> Bolts Missing/ Loose/ Damaged	<input checked="" type="checkbox"/> Set Pressure within MAWP	<input checked="" type="checkbox"/> Set Pressure within MAWP
<input type="checkbox"/> Insulation Damaged	<input type="checkbox"/> Piping Supported	<input type="checkbox"/> Short Threaded	<input checked="" type="checkbox"/> Safety Seal Intact	<input checked="" type="checkbox"/> Safety Seal Intact
<input type="checkbox"/> Penetration Seals Broken	<input type="checkbox"/> Expansion Slots	<input type="checkbox"/> Valves leaking	<input checked="" type="checkbox"/> Service Seal Intact	<input checked="" type="checkbox"/> Service Seal Intact
<input type="checkbox"/> Corrosion Under Insulation (CUI)	<input type="checkbox"/> Bolts Missing/ Loose/ Damaged	<input type="checkbox"/> Connections Leaking	<input checked="" type="checkbox"/> Current Service Tag Attached	<input checked="" type="checkbox"/> Current Service Tag Attached
<input type="checkbox"/> Visible Moisture Contamination	<input type="checkbox"/> Short Threaded	<input type="checkbox"/> Piping and Valves Supported	<input type="checkbox"/> PSV inlet Gusseted	<input type="checkbox"/> PSV inlet Gusseted
<input type="checkbox"/> Paint Deterioration	<input type="checkbox"/> Deflected/Distorted	<input type="checkbox"/> Piping Deflected/ Distorted	<input type="checkbox"/> Inlet Block Valve	<input type="checkbox"/> Inlet Block Valve
<input type="checkbox"/> Coating Deterioration	<input type="checkbox"/> Poor Insulation	<input checked="" type="checkbox"/> No Access Insulated	Locked Open <input type="checkbox"/> Y <input type="checkbox"/> N	Locked Open <input type="checkbox"/> Y <input type="checkbox"/> N
<input type="checkbox"/> Fireproofing Cracked	<input type="checkbox"/> Fire Proofing Cracked	<input checked="" type="checkbox"/> See Comments	Sealed Open <input type="checkbox"/> Y <input type="checkbox"/> N	Sealed Open <input type="checkbox"/> Y <input type="checkbox"/> N
<input type="checkbox"/> External Protection Only	<input checked="" type="checkbox"/> Vessel is level		<input type="checkbox"/> Outlet Block Valve	<input type="checkbox"/> Outlet Block Valve
<input checked="" type="checkbox"/> See Comments	<input type="checkbox"/> See Comments		Locked Open <input type="checkbox"/> Y <input type="checkbox"/> N	Locked Open <input type="checkbox"/> Y <input type="checkbox"/> N
			Sealed Open <input type="checkbox"/> Y <input type="checkbox"/> N	Sealed Open <input type="checkbox"/> Y <input type="checkbox"/> N
			<input checked="" type="checkbox"/> See Comments	<input checked="" type="checkbox"/> See Comments

Observations:
Equipment in ☒ **Good**, ☐ **Fair**, ☐ **Poor** Condition

Good: No concerns found (may still have recommendations)

Fair: Minor issues found that do not impair the "fitness for service" of the equipment, (paint deterioration, general external surface corrosion - no measurable metal loss, not mounted to skid, etc.)

Poor: Equipment had moderate to major concerns found (equipment is damaged, severe external corrosion noted, cracked or broken component, etc.)

☒ **Based on API 510 Visual External Inspection this vessel is fit for service**
(this piece of equipment meets the Jurisdictional requirements)

No access to the shell for visual or UT due to insulation and ice build up.
Temperature gauge appears to be reading too high.
No access to PSVs. PSVs information obtained from TAQA records.
PSV 1 is shell side, PSV 2 is tube side.

Recommendations:

At next turn around perform full UT and visual inspection.
Replace temperature gauge.

Non-Conformance Conditions and Corrective Actions:

Note: Reference any and all Non-Conformance Report (NCR) numbers and Corrective Action Report (CAR) numbers.

None

Recommended Inspection Intervals:

Recommended Maximum Inspection Interval:	60	Months	PRD 1 Recommended Service Interval:	60	Months	PRD 2 Recommended Service Interval:	60	Months
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External Inspection Performed By:

Print Name:

Murray Angus MacGregor

Certification No.:

ABSA IPV PESL: 000622

API 510: 40801

API 653: 48515

PEI Class 2: 158

CWB Level 2: 8501

Signature:



Report Reviewed:


Initial

Chief Inspector /
Client
Representative:

Name (Print)

Signature

Date:

RAM#	433856	EQUIP STATIC RECORD	JOB#	1-4012
Unique OUP #:	603HT005	Old OUP #:	LSD: C-032-H/094-H-08	
PLANT / FIELD:	Chinchaga Gas Plant	Down Hole Location:	RENTAL:	
EQUIPMENT NAME:	Propane Sub Cooler	Unique # of Compressor this equipment is related to:		
VESSEL STATUS:	Active	PRIMARY LOCATION:	Gas Plant	Vessel Car-Sealed Out?
PHYSICAL LOCATION:	Refrigeration Building		YEAR INSTALLED:	
SERVICE:	Sweet	H ₂ S	PROCESS FLUID:	LPG
			CYCLIC:	
MANUFACTURER:	Thermo Design Engineering Ltd.	DWG.#	9097-0850-211 Rev.0	S N:
PRN	for VESSEL or SHELL	CRN	N7421.21	YR. BUILT
NB:	CODE/DIV. ASME VIII DIV.1	PARA.		STAMP
				U
SHELL-TANK				
RADIOGRAPHY:		RT2		JOINT EFF.
PWHT:		Not Stated		
MAWP	1793 kPa	AT	66 °C	MDMT
				-45 °C
AT	1793 kPa			
DIA. ID	154.1 mm	LENGTH:	6096.0 mm	HEIGHT:
				VOLUME:
				m ³
Shell Longitudinal Seam Present _____ Pipe _____				
<u>SECTION</u>	<u>MATERIAL</u>	<u>NOMINAL THICKNESS</u>	<u>C.A.</u>	
Head	SA-350-LF2		mm	mm
Shell	SA-333-6	7.11	mm	1.59 mm
			mm	mm
			mm	mm
			mm	mm
			mm	mm
			mm	mm
Heat Exchangers, Tubing, Channel, Line Heater coil				
PRN		CRN		RADIOGRAPHY:
MAWP	kPa	AT	°C	MDMT
				°C
AT	kPa	S N:		
CODE/DIV.	PARA.	STAMP	TUBE/TUBE SHEET	TEMA CLASS
DIA. ID	146.3 mm	LENGTH:	181.0 mm	TUBE SIZE
				mm
				# of Tubes
<u>SECTION</u>	<u>MATERIAL</u>	<u>NOMINAL THICKNESS</u>	<u>C.A.</u>	
End	SA-350-LF2		mm	mm
Shell	SA-333-6	10.97	mm	1.59 mm
			mm	mm
			mm	mm
TUBING:				
PRN		CRN		TEMA CLASS
				TYPE
S N:				
MAWP	8963 kPa	AT	66 °C	TUBE SIZE
				168.3 mm
GAUGE, BWG	14	TUBE/TUBE SHEET JT.		
# of Tubes		<u>MATERIAL</u>	<u>NOMINAL THICKNESS</u>	<u>C.A.</u>
		SA-516-70N	31.75 mm	1.59 mm
COIL:				
PRN		CRN		COIL NAME:
				HP, LP, FG, HS
MAWP	kPa	AT	°C	TUBE SIZE
				mm
S N:				
# of Tubes		<u>MATERIAL</u>	<u>NOMINAL THICKNESS</u>	<u>C.A.</u>
			mm	mm

RAM#	433856	EQUIP STATIC RECORD	JOB# 1-4012
Unique OUP #:	603HT005	Old OUP #:	LSD: C-032-H/094-H-08

TANK M/WAY OD FLANGE DIMENSIONS: _____ x _____ mm OR IF M/WAY IS ROUND, DIA. IS: _____ mm

TK. HEATED: _____ TYPE OF HEAT: _____ TK. SKIDDED or PORTABLE: _____ GAS BLANKET: _____ DOUBLE WALL: _____

TK. CONSTRUCTION: _____ TANK DYKED: _____ DYKE MATERIAL: _____ Leak Tag#: _____

DYKE LINED: _____ TYPE of LINER: _____ Leak Test Co. _____ Leak Test Date _____

DYKE SHAPE: _____ mm Width: _____ mm Height: _____ mm

DYKE VOLUME: _____ m³ TK. BASE SITTING ON: _____ BETWEEN TK. AND BASE: _____

TANKS INSIDE DYKE: _____

P&ID #: _____ SHUT DOWN: _____

OPERATING PRESSURE: _____ kPa OPERATING TEMP. _____ °C YEAR PUT IN SERVICE: _____

VESSEL CONNECTIONS: NPT _____ FLANGE Yes LARGEST CONNECTION 60.3 mm INSPECTION PORT: Hand Hole

FLANGE ANSI: 300 FLG. FACE: RF SIZE of INSPECTION PORT: 168.3 mm

VESSEL ORIENTATION: Horizontal TYPE OF VESSEL SUPPORT: Saddle IS BOTTLE (VB) BLOCKED: _____

TRAY(VT): Not Stated # of TRAYS _____ MAT'L _____ MFG. _____

PACKING(VK): Not Stated EXT. INSULATED: Yes Full or Partially covered? _____


INSULATION TYPE: Cold CLADDING: SS

TYPE of EXT. INSULATION: _____ EXT. INSULATION THICKNESS: 40.0 mm CUI Susceptible: Yes

EXT. COATING: Enamel Paint INTERNAL COATING: Not Stated INTER. LINING: Not Stated

PRESSURE RELIEF DATA

PSV OUP#	SET PRESSURE	units	CODE: SV, SR, ST, SL or ESD PROTECTS - TANK, SHELL, TUBE (HA or HT), HP coil, LP coil, FG coil, HS coil (heat string coil in line heater), PL, PP, Channel A or B in HP
603SVVS012	1793	kPa	Tube
603SVVS018	8963	kPa	Tube
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	
		kPa	

ITS PRINT NAME: <u>Michael Ryan Michielin</u>	ITS SIGNATURE: 
DATE: data collected - yyyy-mm-dd <u>2018-Jul-09</u>	

EQUIPMENT EXTERNAL INSPECTION REPORT

Customer:	TAQA North	ITS Job No.:	1-4012
District:	North Area	Date:	09-Jul-2018
Facility:	Chinchaga Gas Plant	LSD:	C-032-H/094-H-08
Equip. Description:	Propane Sub Cooler	Serial No.:	1624
Equip./OIP No.:	603HT005	PRN:	Not Stated

Equip. Type: ☐ Column ☐ Cooler ☐ Exchanger ☐ Furnace ☐ Heater ☐ Plate Exchanger ☐ Reboiler ☒ Vessel ☐ Other:

Remedial Action	Service	Associated Components	Shell
<input type="checkbox"/> No Action Required	<input checked="" type="checkbox"/> Sweet <input type="checkbox"/> Sour	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N: Name Plate Secure	<input type="checkbox"/> Good Condition
<input type="checkbox"/> Paint/Coating Repairs	Access and Coverage	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N: Name Plate Legible	<input type="checkbox"/> External Corrosion
<input type="checkbox"/> Insulation Repairs	<input checked="" type="checkbox"/> External Inspection	External Grounding	<input type="checkbox"/> Pitting: (max depth)
<input type="checkbox"/> PSV Service Required	<input type="checkbox"/> Part. External Inspection	<input type="checkbox"/> Direct <input checked="" type="checkbox"/> Indirect <input type="checkbox"/> N	<input type="checkbox"/> Scale
<input type="checkbox"/> Further Assessment Required	<input type="checkbox"/> Internal Inspection (VI) NDE Examination	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> NA: Ladders/ Handrail/ Walkway/ Grating in safe condition?	<input type="checkbox"/> Blistered
<input type="checkbox"/> Condition Damage	<input checked="" type="checkbox"/> UT	<input checked="" type="checkbox"/> See Attached Pictures	<input type="checkbox"/> Mechanical Damage
<input type="checkbox"/> Does not comply with applicable code/safe operating requirement.	<input type="checkbox"/> MT	<input type="checkbox"/> Excessive Vibration	<input type="checkbox"/> Deformation/Distortion
<input type="checkbox"/> Repairs Required	<input type="checkbox"/> PT	<input type="checkbox"/> Y <input type="checkbox"/> N <input checked="" type="checkbox"/> NA: Pressure Gauge within MAWP	<input type="checkbox"/> Condensation/Sweating
<input checked="" type="checkbox"/> See Comments	<input type="checkbox"/> RT	<input type="checkbox"/> Y <input type="checkbox"/> N <input checked="" type="checkbox"/> NA: Temp. Gauge within MDMT	<input type="checkbox"/> No Access
Status	<input type="checkbox"/> BH	<input type="checkbox"/> Y <input type="checkbox"/> N <input checked="" type="checkbox"/> NA: Temp. Gauge within MDMT	<input checked="" type="checkbox"/> No Access Insulated
<input checked="" type="checkbox"/> Operational; <input type="checkbox"/> Idle;	<input type="checkbox"/> Other	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N Attached Piping and Instrumentation in Good Condition	<input type="checkbox"/> No Access Ice Build Up
<input type="checkbox"/> Shut In; <input type="checkbox"/> New Install;	<input type="checkbox"/> See Comments	<input type="checkbox"/> Y <input type="checkbox"/> N Attached Piping and Instrumentation in Good Condition	<input type="checkbox"/> Weld(s) in Good Condition
<input type="checkbox"/> Surplus/Boneyard;		<input type="checkbox"/> See Comments	<input type="checkbox"/> Weld(s) Corroded
<input type="checkbox"/> Other:			<input type="checkbox"/> Weld(s) Poor Quality
			<input type="checkbox"/> Weld(s) Cracked
			<input type="checkbox"/> See Comments

Head (1)	Head (2)	Nozzles
<input type="checkbox"/> Top <input checked="" type="checkbox"/> North <input type="checkbox"/> West	<input type="checkbox"/> Bottom <input checked="" type="checkbox"/> South <input type="checkbox"/> East	<input checked="" type="checkbox"/> RF <input type="checkbox"/> RTJ <input type="checkbox"/> NPT
<input type="checkbox"/> Flat <input checked="" type="checkbox"/> FLG <input type="checkbox"/> ELL <input type="checkbox"/> ECC <input type="checkbox"/> HEMI <input type="checkbox"/> Other	<input type="checkbox"/> Flat <input checked="" type="checkbox"/> FLG <input type="checkbox"/> ELL <input type="checkbox"/> ECC <input type="checkbox"/> HEMI <input type="checkbox"/> Other	<input type="checkbox"/> Good Condition
<input type="checkbox"/> Quick Open Closure	<input type="checkbox"/> Quick Open Closure	<input checked="" type="checkbox"/> Fasteners Engaged
<input type="checkbox"/> Quick Actuating Closure	<input type="checkbox"/> Quick Actuating Closure	<input type="checkbox"/> Repad Weep Holes Clear
<input type="checkbox"/> Good Condition	<input type="checkbox"/> Good Condition	<input type="checkbox"/> Nozzles are Gusseted
<input type="checkbox"/> External Corrosion	<input type="checkbox"/> External Corrosion	<input type="checkbox"/> External Corrosion
<input type="checkbox"/> Pitting: (max depth)	<input type="checkbox"/> Pitting: (max depth)	<input type="checkbox"/> Leaking/Weeping
<input type="checkbox"/> Scale	<input type="checkbox"/> Scale	<input type="checkbox"/> Damaged/Cracked
<input type="checkbox"/> Blistered	<input type="checkbox"/> Blistered	<input type="checkbox"/> Bolts Missing/Loose
<input type="checkbox"/> Mechanical Damage	<input type="checkbox"/> Mechanical Damage	<input type="checkbox"/> Deflection/Distortion
<input type="checkbox"/> Deformation/Distortion	<input type="checkbox"/> Deformation/Distortion	<input type="checkbox"/> Partial Internal Inspection
<input type="checkbox"/> Condensation/Sweating	<input type="checkbox"/> Condensation/Sweating	<input checked="" type="checkbox"/> No Access Insulated
<input type="checkbox"/> No Access	<input type="checkbox"/> No Access	<input type="checkbox"/> Weld(s) in Good Condition
<input checked="" type="checkbox"/> No Access Insulated	<input checked="" type="checkbox"/> No Access Insulated	<input type="checkbox"/> Weld(s) Corroded
<input type="checkbox"/> No Access Ice Build Up	<input type="checkbox"/> No Access Ice Build Up	<input type="checkbox"/> Weld(s) Poor Quality
<input type="checkbox"/> External Protection Only	<input type="checkbox"/> External Protection Only	<input type="checkbox"/> Weld(s) Cracked
<input type="checkbox"/> See Comments	<input type="checkbox"/> See Comments	<input type="checkbox"/> See Comments

External Surface	Supports	Associated Piping	PRD 1	PRD 2
<input checked="" type="checkbox"/> Good Condition	<input checked="" type="checkbox"/> Good Condition	<input checked="" type="checkbox"/> Good Condition	Location: Shell	Location: Tube
<input type="checkbox"/> Painted <input type="checkbox"/> Full <input type="checkbox"/> Part.	<input checked="" type="checkbox"/> Anchor Bolts Secure	<input type="checkbox"/> Corrosion	PSV Tag No.: 603SVS012	PSV Tag No.: 603SVVS018
<input type="checkbox"/> Coated <input type="checkbox"/> Full <input type="checkbox"/> Part.	<input type="checkbox"/> Welded to Skid	<input type="checkbox"/> Pitting: (max depth)	<input checked="" type="checkbox"/> Service Date within Interval	<input checked="" type="checkbox"/> Service Date within Interval
<input checked="" type="checkbox"/> Insulated <input checked="" type="checkbox"/> Full <input type="checkbox"/> Part.	<input type="checkbox"/> Supported by Nozzle(s)	<input type="checkbox"/> Bolts Missing/ Loose/ Damaged	<input checked="" type="checkbox"/> Set Pressure within MAWP	<input checked="" type="checkbox"/> Set Pressure within MAWP
<input type="checkbox"/> Insulation Damaged	<input type="checkbox"/> Piping Supported	<input type="checkbox"/> Short Bolting	<input checked="" type="checkbox"/> Safety Seal Intact	<input checked="" type="checkbox"/> Safety Seal Intact
<input type="checkbox"/> Penetration Seals Broken	<input type="checkbox"/> Expansion Slots	<input type="checkbox"/> Valves leaking	<input checked="" type="checkbox"/> Service Seal Intact	<input checked="" type="checkbox"/> Service Seal Intact
<input type="checkbox"/> Corrosion Under Insulation (CUI)	<input type="checkbox"/> Bolts Missing/ Loose/ Damaged	<input type="checkbox"/> Connections Leaking	<input checked="" type="checkbox"/> Current Service Tag Attached	<input checked="" type="checkbox"/> Current Service Tag Attached
<input type="checkbox"/> Visible Moisture Contamination	<input type="checkbox"/> Short Bolting	<input checked="" type="checkbox"/> Piping and Valves Supported	<input type="checkbox"/> PSV inlet Gusseted	<input type="checkbox"/> PSV inlet Gusseted
<input type="checkbox"/> Paint Deterioration	<input type="checkbox"/> Deflected/Distorted	<input type="checkbox"/> Piping Deflected/ Distorted	<input type="checkbox"/> Inlet Block Valve	<input type="checkbox"/> Inlet Block Valve
<input type="checkbox"/> Coating Deterioration	<input type="checkbox"/> Poor Insulation	<input type="checkbox"/> No Access Insulated	Locked Open <input type="checkbox"/> Y <input type="checkbox"/> N	Locked Open <input type="checkbox"/> Y <input type="checkbox"/> N
<input type="checkbox"/> Fireproofing Cracked	<input type="checkbox"/> Fire Proofing Cracked	<input type="checkbox"/> See Comments	Sealed Open <input type="checkbox"/> Y <input type="checkbox"/> N	Sealed Open <input type="checkbox"/> Y <input type="checkbox"/> N
<input type="checkbox"/> External Protection Only	<input checked="" type="checkbox"/> Vessel is level		<input type="checkbox"/> Outlet Block Valve	<input type="checkbox"/> Outlet Block Valve
<input type="checkbox"/> See Comments	<input type="checkbox"/> See Comments		Locked Open <input type="checkbox"/> Y <input type="checkbox"/> N	Locked Open <input type="checkbox"/> Y <input type="checkbox"/> N
			Sealed Open <input type="checkbox"/> Y <input type="checkbox"/> N	Sealed Open <input type="checkbox"/> Y <input type="checkbox"/> N
			<input checked="" type="checkbox"/> See Comments	<input checked="" type="checkbox"/> See Comments

Observations:
Equipment in ☒ Good, ☐ Fair, or ☐ Poor Condition
Good: No concerns found (may still have recommendations)

Fair: Minor issues found that do not impair the "fitness for service" of the equipment, (paint deterioration, general external surface corrosion - no measurable metal loss, not mounted to skid, etc.)

Poor: Equipment had moderate to major concerns found (equipment is damaged, severe external corrosion noted, cracked or broken component, etc.)

☒ **Based on API 510 Visual External Inspection this vessel is fit for service**

(This piece of equipment meets the Jurisdictional requirements based on the information available at the time of the inspection.)

- Vessel is in good condition. Limited access due to insulation
- Insulation is in good condition.
- Saran wrap on the PRD (603SVVS018) inlet / outlet flanges.

Recommendations:

- Remove the saran wrap off the PRD (603SVVS018) inlet / outlet flanges.

Non-Conformance Conditions and Corrective Actions:

Note: Reference any and all Non-Conformance Report (NCR) numbers and Corrective Action Report (CAR) numbers.

- None.

Recommended Inspection Intervals:

Recommended Maximum Inspection Interval:	60	Months	PRD 1 Recommended Service Interval:	60	Months	PRD 2 Recommended Service Interval:	60	Months
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Pictures:



603SVVS018_C-032-H_OV

External Inspection Performed By:

Print Name: Christopher Russell Earl

Certification No.:

ABSA IPV PESL: 000782
API 510: 45377

Signature:

Christopher Russell Earl

Report Reviewed:

JE
Initial

Chief Inspector /
Client
Representative:

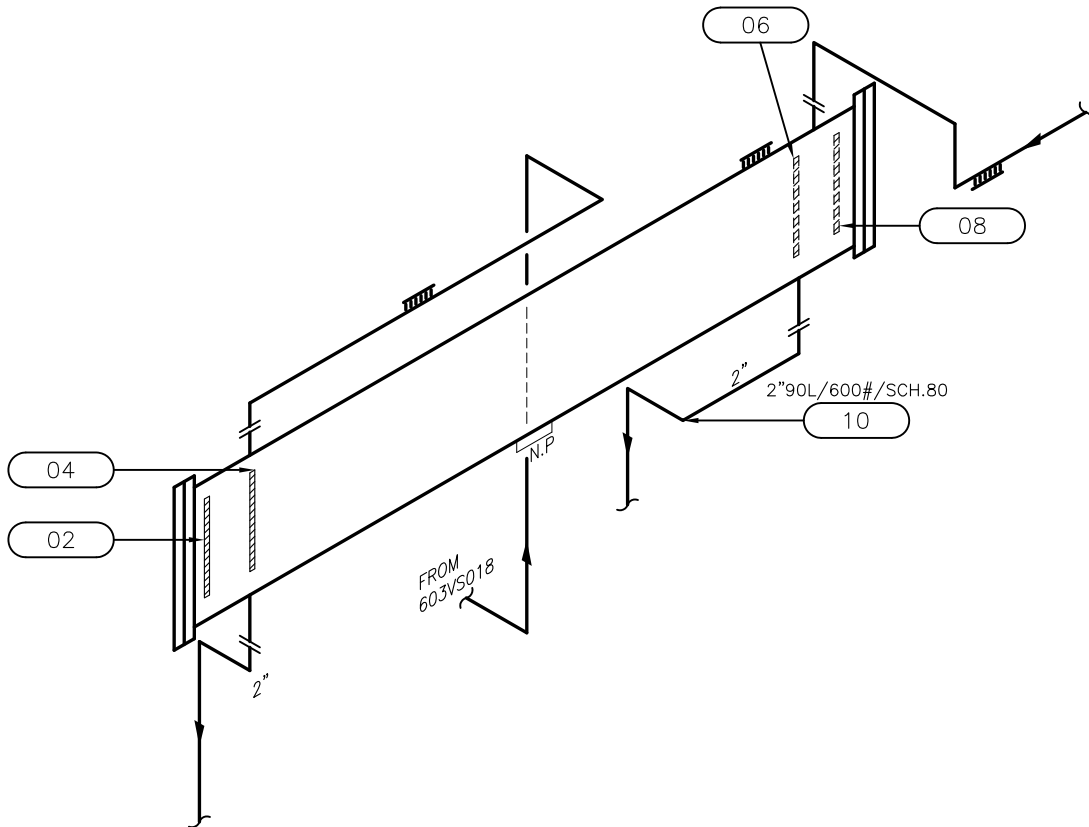
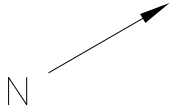
Name (Print)

Signature

Date:

P&ID NO.: N/S

REF. NO.: N/A



U1A ON FILE

P.E. NO.: N/S OUP#: 603HT005
 PROV. REG. NO.: N/S C.R.N.: N7421.21
 SERIAL NO.: 1624 N.B. NO.: N/S

Code/Div.: ASME VIII DIV.1 Size: 154mm ID X 6096mm TS/TS
 Radiography: RT-2 Service: SWEET
 Insulated: YES PWHT: N/S
 Year Built: 1998 Manway: NO Size: N/A
 Manufacturer: THERMO DESIGN ENGINEERING LTD.

Design & Materials Data

HEAD
 Mat'l: N/S Nom.: N/S C.A.: N/S
 Mat'l: Nom.: C.A.:

SHELL
 Mat'l: SA-333-6 Nom.: 7.11mm C.A.: 1.59mm
 Mat'l: Nom.: C.A.:

CHANNEL
 Head Mat'l: SA-350-LF2 Nom.: N/S C.A.: N/S
 Shell Mat'l: SA-333-3 Nom.: 10.97mm C.A.: 1.59mm

BOOT
 Mat'l: Nom.: C.A.:

MAWP Shell Side: @ Temp.:
 MAWP Tube Side: 1793 KPA @ Temp.: 66°C/-45°C

CLIENT	TAQA NORTH	
FACILITY	CHINCHAGA GAS PLANT	
	LSD C-032-H/ 094-H-08	
ITEM	PROPANE SUBCOOLER	
TECH/CAD: C.R.E./F.Y.C.	DATE: 07/2018	DWG. No.: 019

CLIENT: **TAQA North**
FACILITY: Chinchaga Gas Plant
UNIT/AREA:
LSD: C-032-H/094-H-08
DESCRIPTION: Propane Sub Cooler

PROV. REG. #: Not Stated
SERIAL #: 1624
OIP NO.: 603HT005

Description: SOUTH CHANNEL SIDE SHELL T-B
CML: 019-02

NOM. THICK.: 10.97 mm
MILL. TOL.: ASTM
CA: 1.59 mm
MIN. NOM.: 8.01 mm

MATERIAL: SA-333-6
MINIMUM THICKNESS MEASURED: **11.20 mm**
AVERAGE THICKNESS MEASURED: 11.37 mm
CALCULATED T-MIN: Not Stated

Rdg.	B/L Thick. MM/DD/YY		Short Term mm/yr	Long Term mm/yr	Rem. Half Life
	04/07/08	07/09/18			
1	11.40	11.50	0.0000	0.0000	100.00
2	11.00	11.40	0.0000	0.0000	100.00
3	11.10	11.20	0.0000	0.0000	100.00
4	11.40	11.20	0.0195	0.0000	81.79
5	11.90	11.40	0.0487	0.0000	34.80
6	11.80	11.50	0.0292	0.0000	59.76

Description: SOUTH SIDE SHELL T-B
CML: 019-04

NOM. THICK.: 7.11 mm
MILL. TOL.: ASTM
CA: 1.59 mm
MIN. NOM.: 4.63 mm

MATERIAL: SA-333-6
MINIMUM THICKNESS MEASURED: **7.10 mm**
AVERAGE THICKNESS MEASURED: 7.13 mm
CALCULATED T-MIN: Not Stated

Rdg.	B/L Thick. MM/DD/YY		Short Term mm/yr	Long Term mm/yr	Rem. Half Life
	04/07/08	07/09/18			
1	7.20	7.10	0.0097	0.0000	100.00
2	7.20	7.10	0.0097	0.0000	100.00
3	7.20	7.10	0.0097	0.0000	100.00
4	7.20	7.10	0.0097	0.0000	100.00
5	7.60	7.20	0.0390	0.0000	32.95
6	7.40	7.20	0.0195	0.0000	65.90

CLIENT: **TAQA North**
FACILITY: Chinchaga Gas Plant
UNIT/AREA:
LSD: C-032-H/094-H-08
DESCRIPTION: Propane Sub Cooler

PROV. REG. #: Not Stated
SERIAL #: 1624
OIP NO.: 603HT005

Description: NORTH SIDE SHELL T-B

CML: 019-06

NOM. THICK.: 7.11 mm
MILL. TOL.: ASTM
CA: 1.59 mm
MIN. NOM.: 4.63 mm

MATERIAL: SA-333-6
MINIMUM THICKNESS MEASURED: **7.30 mm**
AVERAGE THICKNESS MEASURED: 7.37 mm
CALCULATED T-MIN: Not Stated

Rdg.	B/L Thick. MM/DD/YY		Short Term mm/yr	Long Term mm/yr	Rem. Half Life
	04/07/08	07/09/18			
1	7.30	7.50	0.0000	0.0000	100.00
2	7.30	7.40	0.0000	0.0000	100.00
3	7.10	7.40	0.0000	0.0000	100.00
4	7.20	7.30	0.0000	0.0000	100.00
5	7.50	7.30	0.0195	0.0000	68.46
6	7.30	7.30	0.0000	0.0000	100.00

Description: NORTH CHANNEL SIDE SHELL T-B

CML: 019-08

NOM. THICK.: 10.97 mm
MILL. TOL.: ASTM
CA: 1.59 mm
MIN. NOM.: 8.01 mm

MATERIAL: SA-333-6
MINIMUM THICKNESS MEASURED: **11.10 mm**
AVERAGE THICKNESS MEASURED: 11.23 mm
CALCULATED T-MIN: Not Stated

Rdg.	B/L Thick. MM/DD/YY		Short Term mm/yr	Long Term mm/yr	Rem. Half Life
	04/07/08	07/09/18			
1	11.30	11.40	0.0000	0.0000	100.00
2	11.20	11.40	0.0000	0.0000	100.00
3	11.20	11.10	0.0097	0.0000	100.00
4	11.20	11.20	0.0000	0.0000	100.00
5	11.20	11.20	0.0000	0.0000	100.00
6	11.00	11.10	0.0000	0.0000	100.00

COMMENTS:
2008/04 - READING #1 IS CONFIRMED.

CLIENT: **TAQA North**
FACILITY: Chinchaga Gas Plant
UNIT/AREA:
LSD: C-032-H/094-H-08
DESCRIPTION: Propane Sub Cooler

PROV. REG. #: Not Stated
SERIAL #: 1624
OIP NO.: 603HT005

Description: 2" 90L N-W 600#

CML: 019-10

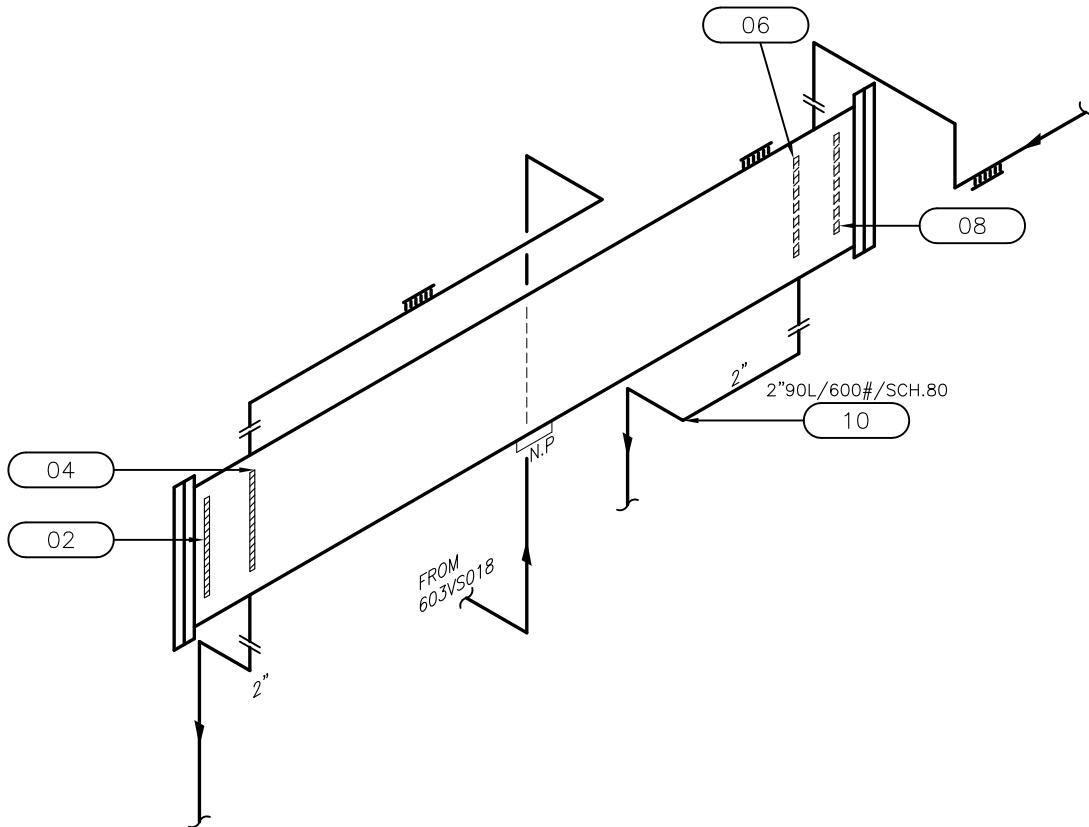
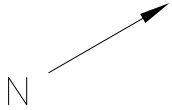
NOM. THICK.: 5.54 mm
MILL. TOL.: ASTM
CA: Not Stated
MIN. NOM.: 4.85 mm

MATERIAL:
MINIMUM THICKNESS MEASURED: **5.10 mm**
AVERAGE THICKNESS MEASURED: 5.26 mm
CALCULATED T-MIN: Not Stated

Rdg.	B/L Thick. MM/DD/YY		Short Term mm/yr	Long Term mm/yr	Rem. Half Life
	04/07/08	07/09/18			
1	5.20	5.40	0.0000	0.0000	100.00
2	5.10	5.30	0.0000	0.0000	100.00
3	5.00	5.20	0.0000	0.0000	100.00
4	5.40	5.30	0.0097	0.0000	23.20
5	5.00	5.10	0.0000	0.0000	100.00

P&ID NO.: N/S

REF. NO.: N/A



U1A ON FILE

P.E. NO.: N/S OUP#: 603HT005
PROV. REG. NO.: N/S C.R.N.: N7421.21
SERIAL NO.: 1624 N.B. NO.: N/S

Code/Div.: ASME VIII DIV.1 Size: 154mm ID X 6096mm TS/TS
Radiography: RT-2 Service: SWEET
Insulated: YES PWHT: N/S
Year Built: 1998 Manway: NO Size: N/A
Manufacturer: THERMO DESIGN ENGINEERING LTD.

Design & Materials Data

HEAD
Mat'l: N/S Nom.: N/S C.A.: N/S
Mat'l: Nom.: C.A.:

SHELL
Mat'l: SA-333-6 Nom.: 7.11mm C.A.: 1.59mm
Mat'l: Nom.: C.A.:

CHANNEL
Head Mat'l: SA-350-LF2 Nom.: N/S C.A.: N/S
Shell Mat'l: SA-333-3 Nom.: 10.97mm C.A.: 1.59mm

BOOT
Mat'l: Nom.: C.A.:

MAWP Shell Side: @ Temp.:
MAWP Tube Side: 1793 KPA @ Temp.: 66°C/-45°C

CLIENT	TAQA NORTH	
FACILITY	CHINCHAGA GAS PLANT	
	LSD C-032-H/ 094-H-08	
ITEM	PROPANE SUBCOOLER	
TECH/CAD: C.R.E./F.Y.C.	DATE: 07/2018	DWG. No.: 019

CLIENT: **TAQA North**
FACILITY: Chinchaga Gas Plant
UNIT/AREA:
LSD: C-032-H/094-H-08
DESCRIPTION: Propane Sub Cooler

PROV. REG. #: Not Stated
SERIAL #: 1624
OIP NO.: 603HT005

Description: SOUTH CHANNEL SIDE SHELL T-B
CML: 019-02

NOM. THICK.: 10.97 mm
MILL. TOL.: ASTM
CA: 1.59 mm
MIN. NOM.: 8.01 mm

MATERIAL: SA-333-6
MINIMUM THICKNESS MEASURED: **11.20 mm**
AVERAGE THICKNESS MEASURED: 11.37 mm
CALCULATED T-MIN: Not Stated

Rdg.	B/L Thick. MM/DD/YY		Short Term mm/yr	Long Term mm/yr	Rem. Half Life
	04/07/08	07/09/18			
1	11.40	11.50	0.0000	0.0000	100.00
2	11.00	11.40	0.0000	0.0000	100.00
3	11.10	11.20	0.0000	0.0000	100.00
4	11.40	11.20	0.0195	0.0000	81.79
5	11.90	11.40	0.0487	0.0000	34.80
6	11.80	11.50	0.0292	0.0000	59.76

Description: SOUTH SIDE SHELL T-B
CML: 019-04

NOM. THICK.: 7.11 mm
MILL. TOL.: ASTM
CA: 1.59 mm
MIN. NOM.: 4.63 mm

MATERIAL: SA-333-6
MINIMUM THICKNESS MEASURED: **7.10 mm**
AVERAGE THICKNESS MEASURED: 7.13 mm
CALCULATED T-MIN: Not Stated

Rdg.	B/L Thick. MM/DD/YY		Short Term mm/yr	Long Term mm/yr	Rem. Half Life
	04/07/08	07/09/18			
1	7.20	7.10	0.0097	0.0000	100.00
2	7.20	7.10	0.0097	0.0000	100.00
3	7.20	7.10	0.0097	0.0000	100.00
4	7.20	7.10	0.0097	0.0000	100.00
5	7.60	7.20	0.0390	0.0000	32.95
6	7.40	7.20	0.0195	0.0000	65.90

CLIENT: **TAQA North**
FACILITY: Chinchaga Gas Plant
UNIT/AREA:
LSD: C-032-H/094-H-08
DESCRIPTION: Propane Sub Cooler

PROV. REG. #: Not Stated
SERIAL #: 1624
OIP NO.: 603HT005

Description: NORTH SIDE SHELL T-B
CML: 019-06

NOM. THICK.: 7.11 mm
MILL. TOL.: ASTM
CA: 1.59 mm
MIN. NOM.: 4.63 mm

MATERIAL: SA-333-6
MINIMUM THICKNESS MEASURED: **7.30 mm**
AVERAGE THICKNESS MEASURED: 7.37 mm
CALCULATED T-MIN: Not Stated

Rdg.	B/L Thick. MM/DD/YY		Short Term mm/yr	Long Term mm/yr	Rem. Half Life
	04/07/08	07/09/18			
1	7.30	7.50	0.0000	0.0000	100.00
2	7.30	7.40	0.0000	0.0000	100.00
3	7.10	7.40	0.0000	0.0000	100.00
4	7.20	7.30	0.0000	0.0000	100.00
5	7.50	7.30	0.0195	0.0000	68.46
6	7.30	7.30	0.0000	0.0000	100.00

Description: NORTH CHANNEL SIDE SHELL T-B
CML: 019-08

NOM. THICK.: 10.97 mm
MILL. TOL.: ASTM
CA: 1.59 mm
MIN. NOM.: 8.01 mm

MATERIAL: SA-333-6
MINIMUM THICKNESS MEASURED: **11.10 mm**
AVERAGE THICKNESS MEASURED: 11.23 mm
CALCULATED T-MIN: Not Stated

Rdg.	B/L Thick. MM/DD/YY		Short Term mm/yr	Long Term mm/yr	Rem. Half Life
	04/07/08	07/09/18			
1	11.30	11.40	0.0000	0.0000	100.00
2	11.20	11.40	0.0000	0.0000	100.00
3	11.20	11.10	0.0097	0.0000	100.00
4	11.20	11.20	0.0000	0.0000	100.00
5	11.20	11.20	0.0000	0.0000	100.00
6	11.00	11.10	0.0000	0.0000	100.00

COMMENTS:
2008/04 - READING #1 IS CONFIRMED.

CLIENT: **TAQA North**
 FACILITY: Chinchaga Gas Plant
 UNIT/AREA:
 LSD: C-032-H/094-H-08
 DESCRIPTION: Propane Sub Cooler

PROV. REG. #: Not Stated
 SERIAL #: 1624
 OIP NO.: 603HT005

Description: 2" 90L N-W 600#

CML: 019-10

NOM. THICK.: 5.54 mm
 MILL. TOL.: ASTM
 CA: Not Stated
 MIN. NOM.: 4.85 mm

MATERIAL:
 MINIMUM THICKNESS MEASURED: **5.10 mm**
 AVERAGE THICKNESS MEASURED: 5.26 mm
 CALCULATED T-MIN: Not Stated

Rdg.	B/L Thick. MM/DD/YY		Short Term mm/yr	Long Term mm/yr	Rem. Half Life
	04/07/08	07/09/18			
1	5.20	5.40	0.0000	0.0000	100.00
2	5.10	5.30	0.0000	0.0000	100.00
3	5.00	5.20	0.0000	0.0000	100.00
4	5.40	5.30	0.0097	0.0000	23.20
5	5.00	5.10	0.0000	0.0000	100.00