RAE Engineering and Inspection Ltd 4810 - 93 Street Edmonton, AB, T6E 5M4 ph: 780-469-2401 fx: 780-468-2422	Inspection Date:	21-Nov-24	**Ultrasonic Thickness Examination**
	Report Date:	6-Dec-24	
	Page:	1 of 7	

Client:	Midstream Equipment	Report Number:	24-PR0003757-CJ-UT-01
Facility:	Valhalla	Location/LSD:	14-30-074-08 W6
Equipment Number:	A0639408 (Unit-1223)	Client Representative:	N/A
Equipment Description:	Horizontal Separator	Client Contact:	N/A

JOB DESCRIPTION

Procedure:	NDE Technical Manual Rev. 2 (NDE-701B)	Surface Condition:	☐ Coated ☐ Bare Steel ☑ Painted ☐ Ground ☐ Blasted ☐ Buffed
Acceptance Code:	ASME Sec. VIII Div. 1 / ASME B31.3		
Material:	Carbon Steel	Surface Temp:	☐ < 0 °C ☑ 0 - 120 °C ☐ 120 - 260 °C ☐ > 260 °C

EQUIPMENT, TECHNIQUE & CALIBRATION

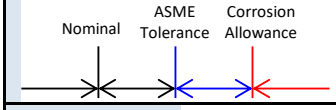
Instrument 1 Mfr:	GE	Model:	DMSGO+	S/N:	GOPLS17070020	Cal. Due:	14-May-25
Instrument 2 Mfr:		Model:		S/N:		Cal. Due:	
Cal Block 1 S/N:	21-2504	1 or 2 Point Cal:	☐ 1 ☑ 2	Calibrated Range:	0.250" - 1.000"	Couplant:	UTX
Cal Block 2 S/N:		1 or 2 Point Cal:	☐ 1 ☐ 2	Calibrated Range:		Couplant:	

	Probe Model	Freq MHz	Angle	Dia. (in)	Probe Type Single	Probe Type Dual	Manufacturer	Serial #	Cable Length	Vel. (m/sec)	Ref dB	Scan dB	Range (in)
1	FH2E	5.0	0°	0.25	☐	☑	Stresstel	15A00JGG	4'	5850	60	As Needed	2
2					☐	☐							

Scope: Conduct 0° straight beam ultrasonic testing on ***Horizontal Separator*** assessing the *components* for any signs of wall thinning due to corrosion, erosion, laminations, or inclusions.

Results: The measurements obtained from the inspection locations showed the thickness of all of the components inspected to be consistent in thickness, however no nominal thicknesses were available for some CMLs . There were no signs of wall thinning, internal corrosion, erosion, laminations or inclusions at the time of inspection. All piping measurements were within the 12.5% mill tolerance, as per ASTM specifications with the exception of CML 65, which was found to be lower than that.

Please see the following pages for the pictures of the nameplate and the overall view, the isometric drawings, and the thickness measurements.



1) Black – Within ASME Tolerance
2) Blue – ≤ Nominal *minus* ASME Tolerance
3) Red – ≤ Nominal *minus* ASME Tolerance *minus* CA or ≤ Nominal *minus* ASME Tolerance (if CA = *N/S*)

1ST Technician	Chaitanya Joshi		CGSB#:		CGSB Level:	
	PRINT	SIGNATURE	SNT#:	71B-078	SNT Level:	1
2ND Technician			CGSB#:		CGSB Level:	
	PRINT	SIGNATURE	SNT#:		SNT Level:	

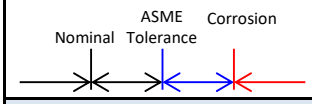
RAE Engineering and Inspection Ltd
4810 - 93 Street Edmonton, AB, T6E 5M4
ph: 780-469-2401 fx: 780-468-2422

Inspection Date:	21-Nov-24	**Ultrasonic Thickness Examination**	
Report Date:	6-Dec-24		
Page:	2 of 7		

Client:	Midstream Equipment	Report Number:	24-PR0003756-CJ-UT-01
Facility:	Valhalla	Location/LSD:	15-11-025-09 W6
Equipment Number:	A0532999 (Unit-1183)	Client Representative:	N/A
Equipment Description:	Dual Chamber Scrubber	Client Contact:	N/A

FLAGGED CMLs

CML #	CML Description	Nom. [in]	Mil. [in]	CA [in]	Ave. [in]	Min. [in]
65	4 XH 90° Elbow	0.337	0.042	*N/S*	0.296	**0.289**



1) Black – Within ASME Tolerance
2) Blue – ≤ Nominal *minus* ASME Tolerance
3) Red – ≤ Nominal *minus* ASME Tolerance *minus* CA or ≤ Nominal *minus* ASME Tolerance (if CA = *N/S*)

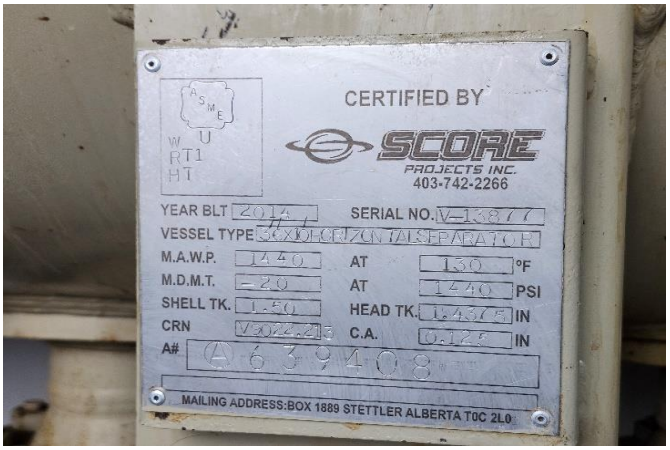
CA: Corrosion Allowance | **Nom.:** Nominal | **Mil.:** Manufacturer's Undertolerance = Piping - 12.5% - ASME IIA-2, SA-530 OR Plate - 0.010in/0.25mm *or* 6% - ASME VIII Div. 1, UG-16

RAE Engineering and Inspection Ltd
4810 - 93 Street Edmonton, AB, T6E 5M4
ph: 780-469-2401 fx: 780-468-2422

Inspection Date:	21-Nov-24	**Ultrasonic Thickness Examination**	
Report Date:	6-Dec-24		
Page:	3 of 7		

Client:	Midstream Equipment	Report Number:	24-PR0003757-CJ-UT-01
Facility:	Valhalla	Location/LSD:	14-30-074-08 W6
Equipment Number:	A0639408 (Unit-1223)	Client Representative:	N/A
Equipment Description:	Horizontal Separator	Client Contact:	N/A

PHOTOGRAPHS



View of Nameplate & LSD

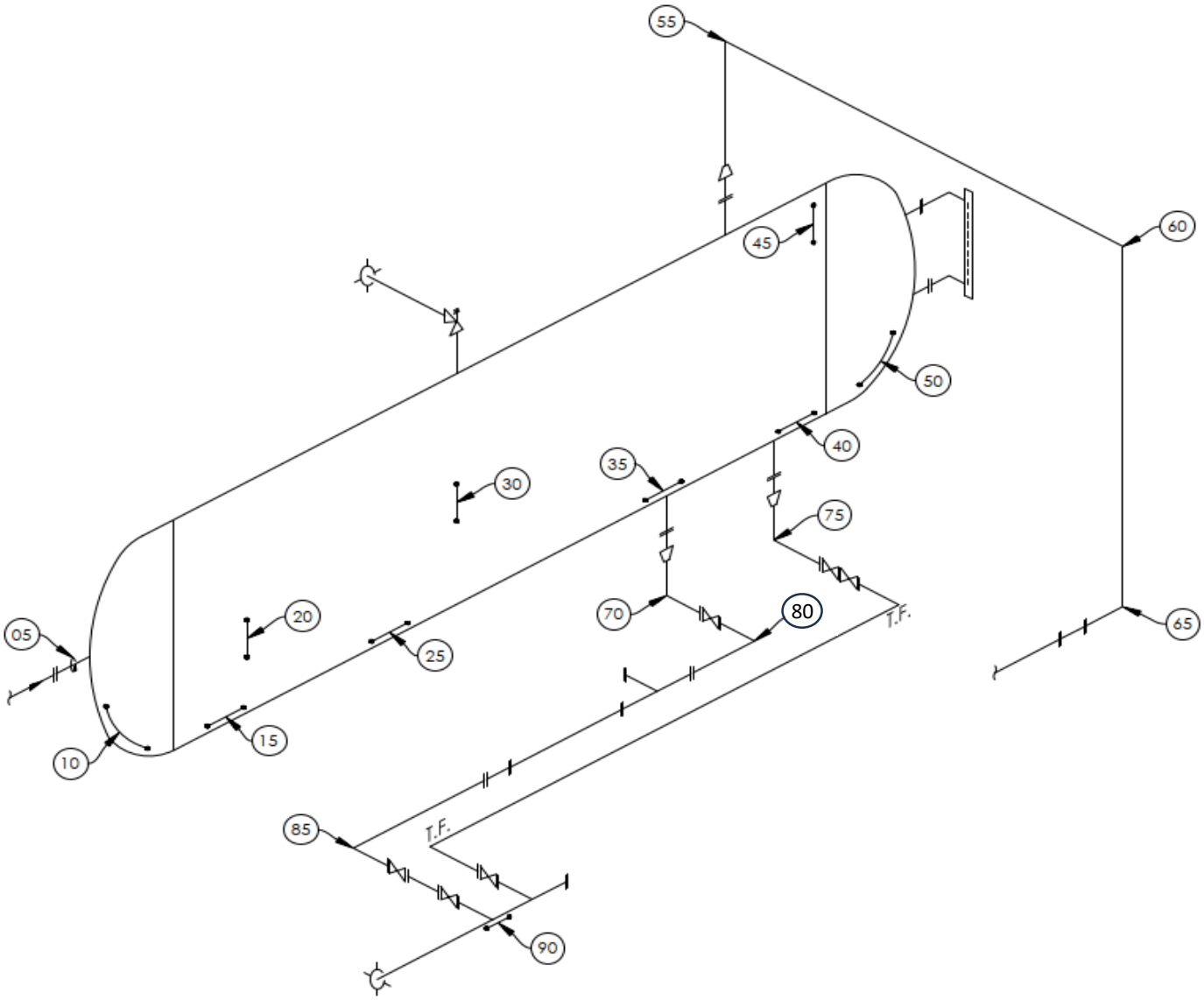
View of Equipment

RAE Engineering and Inspection Ltd
4810 - 93 Street Edmonton, AB, T6E 5M4
ph: 780-469-2401 fx: 780-468-2422

Inspection Date:	21-Nov-24	**Ultrasonic Thickness Examination**	
Report Date:	6-Dec-24		
Page:	4 of 7		

Client:	Midstream Equipment	Report Number:	24-PR0003757-CJ-UT-01
Facility:	Valhalla	Location/LSD:	14-30-074-08 W6
Equipment Number:	A0639408 (Unit-1223)	Client Representative:	N/A
Equipment Description:	Horizontal Separator	Client Contact:	N/A

EQUIPMENT CML ISO DRAWING



RAE Engineering and Inspection Ltd
4810 - 93 Street Edmonton, AB, T6E 5M4
ph: 780-469-2401 fx: 780-468-2422

Inspection Date:	21-Nov-24
Report Date:	6-Dec-24
Page:	5 of 7

Ultrasonic Thickness Examination

Client:	Midstream Equipment	Report Number:	24-PR0003757-CJ-UT-01
Facility:	Valhalla	Location/LSD:	14-30-074-08 W6
Equipment Number:	A0639408 (Unit-1223)	Client Representative:	N/A
Equipment Description:	Horizontal Separator	Client Contact:	N/A

CML DATA

Units: inches

CML	Description	01	02	03	04	05	06	07	08	09	10	11	12
05	***6 Nozzle***									Min. =	1.410	Ave. =	1.416
	Nom: *N/S* Mil: N/S CA: *N/S*	1.413	1.410	1.418	1.423								
10	***Lower Head***									Min. =	1.458	Ave. =	1.469
	Nom: 1.438 Mil: N/S CA: 0.125	1.465	1.468	1.465	1.474	1.458	1.460	1.468	1.476	1.474	1.477	1.471	1.473
15	***Bottom Shell***									Min. =	1.484	Ave. =	1.494
	Nom: 1.500 Mil: *N/S* CA: 0.125	1.492	1.491	1.497	1.502	1.499	1.484	1.491	1.497	1.494	1.493	1.489	1.495
20	***Lower Shell***									Min. =	1.497	Ave. =	1.505
	Nom: 1.500 Mil: *N/S* CA: 0.125	1.513	1.514	1.516	1.510	1.506	1.500	1.498	1.500	1.497	1.499	1.500	1.507
25	***Bottom Shell***									Min. =	1.488	Ave. =	1.502
	Nom: 1.500 Mil: *N/S* CA: 0.125	1.496	1.489	1.488	1.493	1.496	1.506	1.510	1.511	1.504	1.505	1.507	1.513
30	***Mid Shell***									Min. =	1.502	Ave. =	1.513
	Nom: 1.500 Mil: *N/S* CA: 0.125	1.515	1.518	1.502	1.507	1.509	1.508	1.515	1.519	1.517	1.518	1.520	1.513
35	***Bottom Shell***									Min. =	1.491	Ave. =	1.507
	Nom: 1.500 Mil: *N/S* CA: 0.125	1.491	1.499	1.498	1.503	1.502	1.506	1.510	1.514	1.513	1.517	1.521	1.515
40	***Bottom Shell***									Min. =	1.510	Ave. =	1.518
	Nom: 1.500 Mil: *N/S* CA: 0.125	1.521	1.519	1.516	1.518	1.516	1.519	1.525	1.522	1.517	1.519	1.516	1.510
45	***Upper Shell***									Min. =	1.509	Ave. =	1.512
	Nom: 1.500 Mil: *N/S* CA: 0.125	1.510	1.515	1.514	1.513	1.511	1.510	1.509	1.515	1.511	1.514	1.512	1.509
50	***Lower Head***									Min. =	1.483	Ave. =	1.494
	Nom: 1.438 Mil: *N/S* CA: 0.125	1.483	1.488	1.491	1.497	1.503	1.495	1.494	1.497	1.492	1.499	1.492	1.500
55	***4 XH 90° Elbow***									Min. =	0.321	Ave. =	0.325
	Nom: 0.337 Mil: 0.042 CA: *N/S*	0.321	0.324	0.325	0.326	0.323	0.328						
60	***4 XH 90° Elbow***									Min. =	0.335	Ave. =	0.337
	Nom: 0.337 Mil: 0.042 CA: *N/S*	0.335	0.338	0.339	0.335	0.337	0.336						
65	***4 XH 90° Elbow***									Min. =	**0.289**	Ave. =	0.296
	Nom: 0.337 Mil: 0.042 CA: *N/S*	0.302	0.306	**0.293**	**0.289**	**0.290**	**0.293**						
70	***2 XH 90° Elbow***									Min. =	0.258	Ave. =	0.262
	Nom: 0.218 Mil: 0.027 CA: *N/S*	0.263	0.267	0.260	0.258								
75	***2 160 90° Elbow***									Min. =	0.312	Ave. =	0.315
	Nom: 0.344 Mil: 0.043 CA: *N/S*	0.312	0.314	0.316	0.318								
80	***2 XH 90° Elbow***									Min. =	0.198	Ave. =	0.200
	Nom: 0.218 Mil: 0.027 CA: *N/S*	0.199	0.198	0.203	0.201								
85	***2 XH 90° Elbow***									Min. =	0.219	Ave. =	0.222
	Nom: 0.218 Mil: 0.027 CA: *N/S*	0.221	0.219	0.225	0.222								
90	***2 XH 3"X2" Tee***									Min. =	0.269	Ave. =	0.368
	Nom: 0.218 Mil: 0.027 CA: *N/S*	0.395	0.401	0.383	0.385	0.419	0.416	0.269	0.272				

NPS = Nominal Pipe Size | **Sch** = Schedule | **Rating** = Flange Pressure Rating | **Nom** = Nominal | **CA** = Corrosion Allowance | **Ave** = Average | **Min** = Minimum

Mil = Manufacturer's Undertolerance = Piping - 12.5% - ASME IIA-2, SA-530 OR Plate - 0.01in/0.25mm or 6% - ASME VIII Div. 1, UG-16

CALIBRATION CERTIFICATE

RAE Engineering and Inspection Ltd.

OVER 50 YEARS

NDE-709D Thickness Gage Horizontal Linearity Certificate of Calibration

Instrument Make: GE
Transducer Make: Stresstel
Instrument Model: DMSGO+
Transducer Model: 0.250" 5MHz
Instrument S/N: GOPLS17070020
Transducer S/N: 15A00JGG
Temperature: 20°C
Couplant: UTX

Table 1: Thickness Gage Horizontal Linearity Data

CALIBRATION BLOCK S/N	CALIBRATION BLOCK THICKNESS (IN)	BACKWALL NUMBER	MEASURED LENGTH (IN)	DEVIATION (IN)	TOLERANCE (IN)	ACCEPTABLE
20-3222	0.040	1st	0.038	0.002	±0.006	Yes
22-1408	0.100	1st	0.100	0.000	±0.006	Yes
22-1408	0.200	1st	0.201	0.001	±0.006	Yes
22-1408	0.300	1st	0.300	0.000	±0.006	Yes
22-1408	0.400	1st	0.400	0.000	±0.006	Yes
22-1408	0.500	1st	0.500	0.000	±0.006	Yes
15-1096	1.000	1st	1.000	0.000	±0.006	Yes
15-1096	2.000	1st	2.000	0.000	±0.006	Yes
15-1096	3.000	1st	3.000	0.000	±0.006	Yes
15-1096	4.000	1st	4.001	0.001	±0.006	Yes

Technician Name: Hyekyong Jun (CGSB 17600)
Signature:
Date: May 14th, 2024
Calibration Due: May 14th, 2025

RAE Engineering and Inspection Ltd
4810 - 93 Street Edmonton, AB, T6E 5M4
ph: 780-469-2401 fx: 780-468-2422

Inspection Date:	21-Nov-24
Report Date:	6-Dec-24
Page:	7 of 7

Ultrasonic Thickness Examination

Client:	Midstream Equipment	Report Number:	24-PR0003757-CJ-UT-01
Facility:	Valhalla	Location/LSD:	14-30-074-08 W6
Equipment Number:	A0639408 (Unit-1223)	Client Representative:	N/A
Equipment Description:	Horizontal Separator	Client Contact:	N/A

CERTIFICATIONS

Method	Level	Expiry Date
UT	1	24-Oct-29

Corrective Lenses Required: ☐ Yes ☑ No

By: Zong Jun Wang
Title: NDE Level 3
Signature:
Date: 22-Oct-24

RAE Engineering and Inspection Ltd.

Certification Record

This is to certify that:

Chaitanya Joshi

The above named employee has satisfactorily met the qualification requirements of the RAE Engineering and Inspection Ltd. written practice that meets the requirements of ASNT recommended practice SNT-TC-1A 2020 edition

Certification No.: RAE-710B-078