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## Ultrasonic Inspection Report

**UT\_11-28-74-10\_Knopicik\_aug2024**

Client: <b>Inclusive Energy</b>	Facility: <b>Knopicik Field</b>	Date: <b>Aug 27, 2024</b>
LSD: <b>11-28-74-10 w6m</b>	Item(s) Inspected: <b>Horizontal Separator</b>	Job #: <b>11841</b>
Material: Carbon Steel / Stainless Steel	Thickness Range: 0 to 75mm	WO #: <b>n/a</b>
Procedure: UT-01 Rev. 9	Ref. Code: ASME VIII & ASME B31.3	Surf. Temp: -20° to 20° C
UT Equipment: Asset# FD-12	Olympus Epoch XT	Serial Number: 121454107
Transducer 1: Asset# T-232	Technisonic Research	0° Dual 5MHz Diam. 6.35mm
Transducer 2: Asset# T-168	Olympus D790-SM	Hot Probe 0° 5MHz Diam. 6.35mm
Transducer 3: Asset# T-182	Olympus pulse echo	0° 5MHz Diameter 12.7mm
Cal. Block 1: Asset# CB-81 (1018)	Carbon Steel 6-step wedge	Serial Number: 64289
Cal. Block 2: Asset# CB-60	Stainless Steel Step Wedge	2.5mm to 12.5mm
Couplant: Magnaflux UTX	Cable 1: 2m Dual BNC to Microdot	Cable 2: 2m Single BNC to Microdot

**Job Scope:** To perform an ultrasonic thickness survey on the requested separator located at 11-28-74-10 w6m in the Knopicik Field.

**Results:** See attached UTS drawing and data sheets for all point locations and recorded thickness measurements.

Client Representative: Mike Davidson
Technician(s): Kevin Wedler (CGSB UT-1, MT-2 #24491) (SNT-TC-1A UT-I, MT-II)
Assistant(s): Conor Frith
Reviewed and Approved By: Lance Smith (CGSB MT-2, UT-2, PT-2, RT-1 #8052) (SNT-TC-1A MT-II, UT-II, PT-II)



## **ULTRASONIC THICKNESS SURVEY**

### **“UTS”**

#### **Report Summary**

The accompanying UTS report provides representation and data of equipment requested for inspection as accessible. The UTS drawing(s) show condition monitoring locations (CMLs) with identification numbers that correlate with the ultrasonic thickness readings recorded on the following pages. All CML locations identified on the UTS drawing(s) are inspected to locate the minimum thickness and determine an average thickness. CMLs that have thickness readings less than the calculated flagged thickness are coloured **BLUE** on the UTS drawings and data pages for quick reference purposes. CMLs with unusual wall thicknesses are given descriptive comments to aid future trending.

#### **UTS Procedure**

All CML locations identified on the UTS drawing are scanned completely by continuously coupling an ultrasonic transducer to the item being tested. The average scan location on vessel heads and shells includes a 2” wide by 16” long test band. The average scan location on piping and fittings is a 2” wide band at critical areas, such as the outside radius of elbows, the neck of tees, the back of tees, or any other areas of concern.

#### **Equipment**

All equipment used for each UTS is listed on the ultrasonic report and is in accordance with Lance Inspections Inc. procedure UT-01 (Rev. 9). All ultrasonic machine calibrations, field calibrations, and performance of ultrasonic thickness surveys are completed in accordance with Lance Inspections Inc. procedure UT-01 (Rev. 9)

#### **Flag Values**

##### **Client Review**

Lance Inspections does not deem CMLs acceptable or rejectable. The flag values in the attached report are provided for ease of client review only.

##### **Vessels**

Flag thicknesses are determined by subtracting the corrosion allowances from the nominal thickness as stated on a vessel data plate or a client-provided MDR or U1A form for the vessel.

Regarding vessel and nozzle points that have a known Nominal Thickness but no stated corrosion allowance, Lance Inspections has adopted a “TRF” Thickness Reduction Flag value. This value is 1.5mm (0.059”) less than the known nominal thickness. Vessel and Nozzle points without known nominals, will be given a 1.5mm (0.059”) corrosion allowance from the initial minimum thickness reading.

##### **Piping**

Flag thicknesses for piping are determined by subtracting 12.5% (mill tolerance) from the nominal thickness. The 12.5% is input as the corrosion allowance on the UTS report. Piping and fitting points without known nominals will have a 1.5mm corrosion allowance from the initial minimum thickness reading.

Sincerely,

Lance Smith,  
Lance Inspections Inc.



**Inclusive Energy**  
**Knopcik Field**  
**11-28-74-10 w6m**

Dwg#	Item Description	Reg A#	Serial #	CRN #	Date of Last Inspection	U-1A or MFG	Flagged Items
						Design Data Required	
1	Horizontal Inlet Separator	0433615	V-2699A	N7408.2	Aug. 27, 24		<a href="#">185</a> , <a href="#">190</a>

Customer: INCLUSIVE ENERGYDescription: HORIZONTAL INLET SEPARATORFacility: KNOPIK FIELDLocation: 11-28-74-10 W6MReg A#: 0433615Serial #: V-2699ADrawing#: 1CRN #: N7408.2Manufacturer: OPSCO '92 INDUSTRIESUnit #: N/AYear Built: 1997Shell MAWP: 9894 kPaShell MAWT: 54°CShell Material: SA 516 70Nominal: 63.5mmCA: 3.2mm

Tube "A" MAWP: \_\_\_\_\_

Tube "A" MAWT: \_\_\_\_\_

Head Material: SA 516 70Nominal: 61.6mmCA: 3.2mm

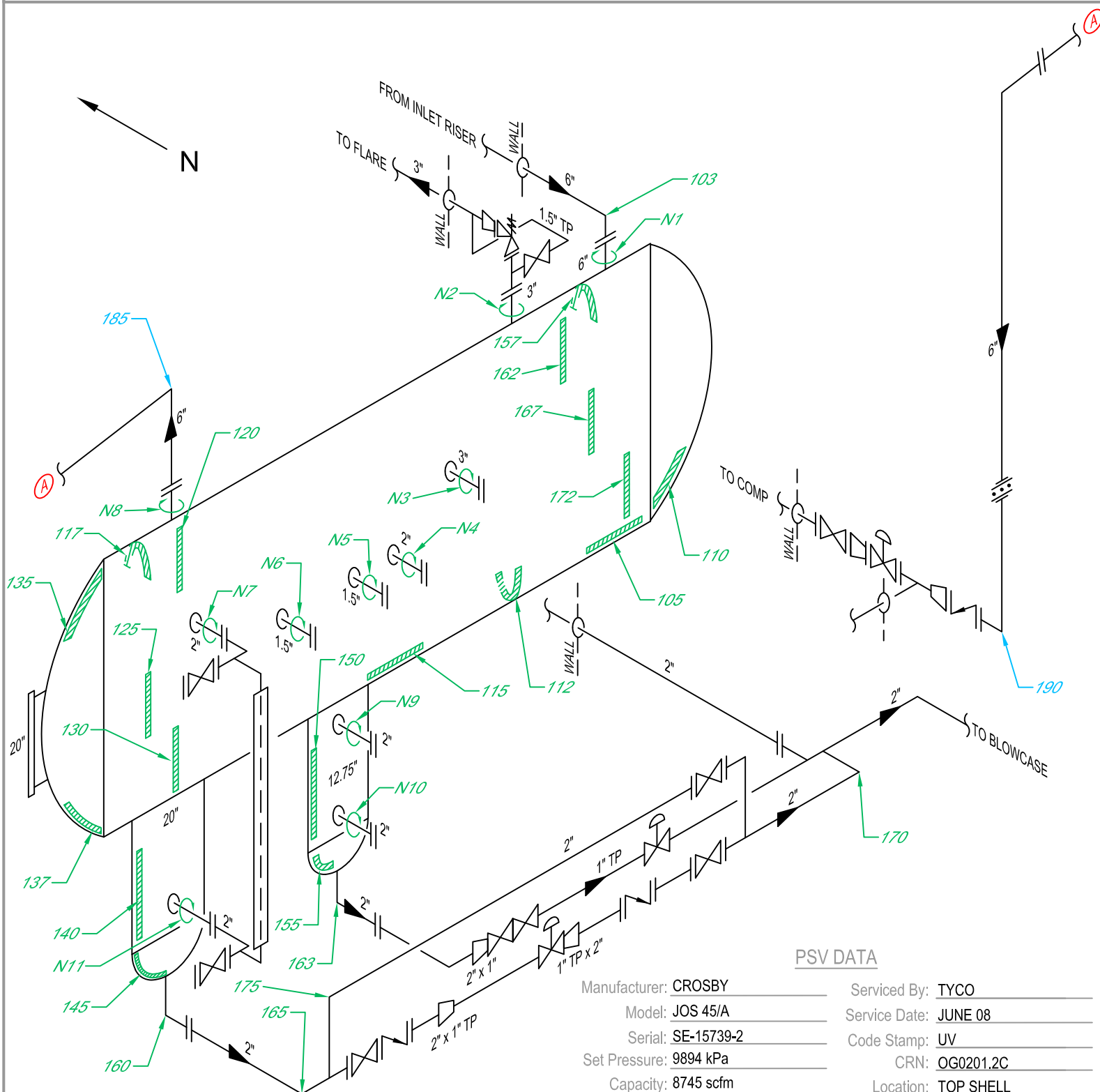
Tube "B" MAWP: \_\_\_\_\_

Tube "B" MAWT: \_\_\_\_\_

Tube Material: \_\_\_\_\_

Nominal: \_\_\_\_\_

CA: \_\_\_\_\_

Size: 48in x 18ftManway: 20inMDMT: -29°CBoot Shell Mat: N/SNominal: N/SCA: 3.2mmInsulated: NOC Stamp: URT: 1PWHT: YESBoot Head Mat: N/SNominal: N/SCA: 3.2mm

### PSV DATA

Manufacturer: CROSBYServed By: TYCOModel: JOS 45/AService Date: JUNE 08Serial: SE-15739-2Code Stamp: UVSet Pressure: 9894 kPaCRN: OG0201.2CCapacity: 8745 scfmLocation: TOP SHELLTag: EK-24Inlet Size: 1.5" 600 lbFlows To: FLAREOutlet Size: 2" 150 lb



Client: Inclusive Energy

Facility: Knopcik Field

LSD: 11-28-74-10 w6m

Equip Description: Horizontal Inlet Separator

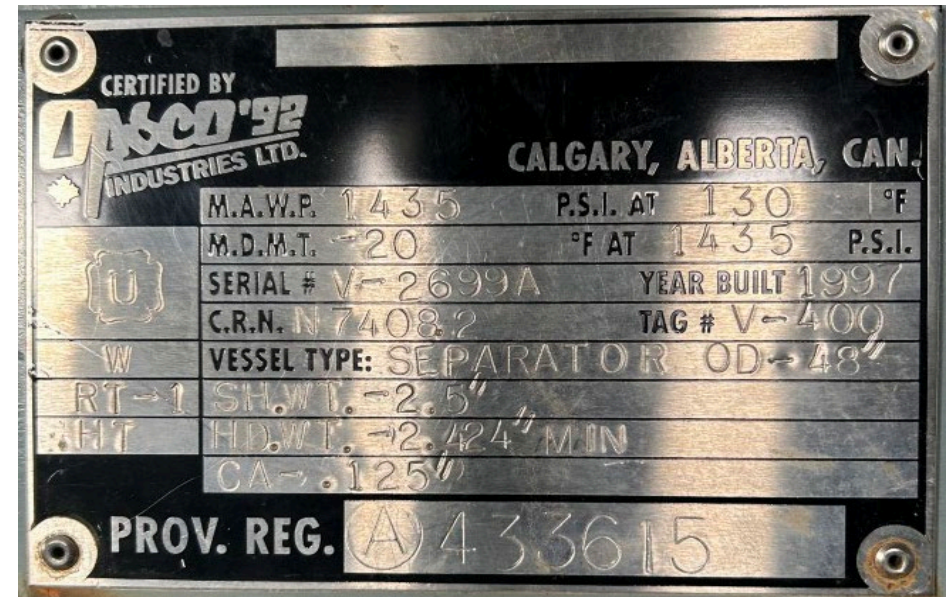
Reg A#: 0433615

Drawing #: 1

Vessel Overview



Data Plate







## UTS Data Sheet

Client: **Inclusive Energy**

Facility: **Knopcik Field**

LSD: **11-28-74-10 w6m**

Equip Description: **Horizontal Inlet Separator**

Reg A#: **0433615**

Drawing #: **1**

					Nominal Thickness (mm)	Corrosion Allowance (mm)	Flag Thickness (mm)
<b>103</b>	Description: <b>6" 90° Elbow</b>				11.0	1.4	9.6
	Date:	Oct 2, 08	Jan 25, 10	Nov 15, 11	Aug. 27, 24		
	Minimum:	10.2	10.0	10.0	10.0		
	Average:	11.0	10.8	10.8	10.8		
	Comments:						
<b>105</b>	Description: <b>Bottom Shell</b>				63.5	3.2	60.3
	Date:	Oct 2, 08	Jan 25, 10	Nov 15, 11	Aug. 27, 24		
	Minimum:	63.9	63.9	63.9	63.9		
	Average:	64.0	64.0	64.0	64.0		
	Comments:	Aug 2024_External corrosion noted.					
<b>110</b>	Description: <b>Lower East Head</b>				61.6	3.2	58.4
	Date:	Oct 2, 08	Jan 25, 10	Nov 15, 11	Aug. 27, 24		
	Minimum:	62.2	62.2	62.2	62.2		
	Average:	63.3	63.3	63.3	63.3		
	Comments:	Min scan at top of band. Aug 2024_External corrosion noted.					
<b>112</b>	Description: <b>Bottom Shell</b>				63.5	3.2	60.3
	Date:	Oct 2, 08	Jan 25, 10	Nov 15, 11	Aug. 27, 24		
	Minimum:	64.0	63.7	63.7	63.7		
	Average:	64.1	64.0	64.0	64.0		
	Comments:						
<b>115</b>	Description: <b>Bottom Shell</b>				63.5	3.2	60.3
	Date:	Oct 2, 08	Jan 25, 10	Nov 15, 11	Aug. 27, 24		
	Minimum:	64.7	64.5	64.5	64.5		
	Average:	64.8	64.7	64.7	64.7		
	Comments:						
<b>117</b>	Description: <b>Top Shell</b>				63.5	3.2	60.3
	Date:	Aug. 27, 24					
	Minimum:	64.8					
	Average:	65.2					
	Comments:						
<b>120</b>	Description: <b>Upper Shell</b>				63.5	3.2	60.3
	Date:	Oct 2, 08	Jan 25, 10	Nov 15, 11	Aug. 27, 24		
	Minimum:	64.7	64.7	64.7	64.7		
	Average:	64.9	64.9	64.9	64.9		
	Comments:						
<b>125</b>	Description: <b>Mid Shell</b>				63.5	3.2	60.3
	Date:	Oct 2, 08	Jan 25, 10	Nov 15, 11	Aug. 27, 24		
	Minimum:	64.6	64.6	64.6	64.6		
	Average:	64.7	64.7	64.7	64.7		
	Comments:						



## UTS Data Sheet

Client: **Inclusive Energy**

Facility: **Knopcik Field**

LSD: **11-28-74-10 w6m**

Equip Description: **Horizontal Inlet Separator**

Reg A#: **0433615**

Drawing #: **1**

					Nominal Thickness (mm)	Corrosion Allowance (mm)	Flag Thickness (mm)
<b>130</b>	Description: <b>Lower Shell</b>				63.5	3.2	60.3
	Date: Oct 2, 08	Jan 25, 10	Nov 15, 11	Aug. 27, 24			
	Minimum: 64.4	64.4	64.4	64.4			
	Average: 64.6	64.6	64.6	64.6			
	Comments:						
<b>135</b>	Description: <b>Upper West Head</b>				61.6	3.2	58.4
	Date: Oct 2, 08	Jan 25, 10	Nov 15, 11	Aug. 27, 24			
	Minimum: 62.4	62.4	62.4	62.4			
	Average: 64.5	64.5	64.5	64.5			
	Comments:						
<b>137</b>	Description: <b>Lower West Head</b>				61.6	3.2	58.4
	Date: Oct 2, 08	Jan 25, 10	Nov 15, 11	Aug. 27, 24			
	Minimum: 62.8	62.8	62.8	62.8			
	Average: 64.4	64.4	64.4	64.4			
	Comments: <i>Nov 2011_Min scan at top of band.</i>						
<b>140</b>	Description: <b>Lower Boot Shell</b>				38.1	3.2	34.9
	Date: Oct 2, 08	Jan 25, 10	Nov 15, 11	Aug. 27, 24			
	Minimum: 37.4	37.4	37.4	37.4			
	Average: 37.8	37.8	37.8	37.8			
	Comments: <i>Min scan at mid band. Aug 2024_External corrosion noted.</i>						
<b>145</b>	Description: <b>Boot Head</b>				38.1	3.2	34.9
	Date: Oct 2, 08	Jan 25, 10	Nov 15, 11	Aug. 27, 24			
	Minimum: 37.0	37.0	36.8	36.8			
	Average: 38.9	38.9	38.9	38.9			
	Comments: <i>Min scan at knuckle. Aug 2024_External corrosion noted.</i>						
<b>150</b>	Description: <b>Lower Boot Shell</b>				28.6	3.2	25.4
	Date: Oct 2, 08	Jan 25, 10	Nov 15, 11	Aug. 27, 24			
	Minimum: 31.8	31.8	31.7	31.7			
	Average: 32.4	32.4	32.4	32.4			
	Comments:						
<b>155</b>	Description: <b>Boot Head</b>				28.6	3.2	25.4
	Date: Oct 2, 08	Jan 25, 10	Nov 15, 11	Aug. 27, 24			
	Minimum: 29.7	29.7	29.7	29.7			
	Average: 32.5	32.5	32.5	32.5			
	Comments: <i>Nov 2011_Min scan at knuckle.</i>						
<b>157</b>	Description: <b>Top Shell</b>				63.5	3.2	60.3
	Date: Aug. 27, 24						
	Minimum: 64.3						
	Average: 64.5						
	Comments:						



## UTS Data Sheet

Client: **Inclusive Energy**

Facility: **Knopcik Field**

LSD: **11-28-74-10 w6m**

Equip Description: **Horizontal Inlet Separator**

Reg A#: **0433615**

Drawing #: **1**

					Nominal Thickness (mm)	Corrosion Allowance (mm)	Flag Thickness (mm)
<b>160</b>	Description: <b>2" 90° Nozzle</b>				8.7	3.2	5.5
	Date: Oct 2, 08	Jan 25, 10	Nov 15, 11	Aug. 27, 24			
	Minimum: 8.3	8.3	8.1	8.1			
	Average: 8.8	8.8	8.6	8.6			
	Comments:						
<b>162</b>	Description: <b>Upper Shell</b>				63.5	3.2	60.3
	Date: Aug. 27, 24						
	Minimum: 64.1						
	Average: 64.3						
	Comments:						
<b>163</b>	Description: <b>2" 90° Nozzle</b>				8.7	3.2	5.5
	Date: Oct 2, 08	Jan 25, 10	Nov 15, 11	Aug. 27, 24			
	Minimum: 8.7	8.7	8.3	8.3			
	Average: 9.0	9.0	8.7	8.7			
	Comments:						
<b>165</b>	Description: <b>2" 90° Elbow</b>				8.7	1.1	7.6
	Date: Oct 2, 08	Jan 25, 10	Nov 15, 11	Aug. 27, 24			
	Minimum: 8.1	8.1	7.9	7.9			
	Average: 8.8	8.8	8.5	8.5			
	Comments:						
<b>167</b>	Description: <b>Mid Shell</b>				63.5	3.2	60.3
	Date: Aug. 27, 24						
	Minimum: 64.1						
	Average: 64.3						
	Comments:						
<b>170</b>	Description: <b>2" 90° Elbow</b>				8.7	1.1	7.6
	Date: Oct 2, 08	Jan 25, 10	Nov 15, 11	Aug. 27, 24			
	Minimum: 8.5	8.5	8.3	8.3			
	Average: 9.0	9.0	8.7	8.7			
	Comments:						
<b>172</b>	Description: <b>Lower Shell</b>				63.5	3.2	60.3
	Date: Aug. 27, 24						
	Minimum: 63.8						
	Average: 64.1						
	Comments:						
<b>175</b>	Description: <b>2" 90° Elbow</b>				8.7	1.1	7.6
	Date: Oct 2, 08	Jan 25, 10	Nov 15, 11	Aug. 27, 24			
	Minimum: 8.1	8.1	8.1	8.1			
	Average: 8.8	8.8	8.5	8.5			
	Comments:						



Drawing #: **1**

					Nominal Thickness (mm)	Corrosion Allowance (mm)	Flag Thickness (mm)
185							
Description: 6" 90° Elbow					11.0	1.4	9.6
Date: Oct 2, 08 Jan 25, 10 Nov 15, 11 Aug. 27, 24							
Minimum: 9.4 9.2 9.0 9.0							
Average: 10.0 9.8 9.6 9.6							
Comments: Aug 2024_External corrosion noted.							
190							
Description: 6" 90° Elbow					11.0	1.4	9.6
Date: Oct 2, 08 Jan 25, 10 Nov 15, 11 Aug. 27, 24							
Minimum: 9.4 9.4 9.4 9.4							
Average: 10.2 10.2 9.9 9.9							
Comments: Aug 2024_External corrosion noted.							
N1							
Description: Circ on 6" Nozzle					21.9	3.2	18.7
Date: Aug. 27, 24							
Minimum: 36.7							
Average: 36.9							
Comments:							
N2							
Description: Circ on 3" Nozzle					7.6	3.2	4.4
Date: Aug. 27, 24							
Minimum: 10.2							
Average: 10.5							
Comments:							
N3							
Description: Circ on 3" Nozzle					15.2	3.2	12.0
Date: Aug. 27, 24							
Minimum: 21.8							
Average: 22.3							
Comments:							
N4							
Description: Circ on 2" Nozzle					8.7	3.2	5.5
Date: Aug. 27, 24							
Minimum: 8.5							
Average: 8.8							
Comments:							
N5							
Description: Circ on 1.5" Nozzle					10.2	3.2	7.0
Date: Aug. 27, 24							
Minimum: 15.4							
Average: 15.7							
Comments:							
N6							
Description: Circ on 1.5" Nozzle					10.2	3.2	7.0
Date: Aug. 27, 24							
Minimum: 15.3							
Average: 15.6							
Comments:							



## UTS Data Sheet

Client: **Inclusive Energy**

Facility: **Knopcik Field**

LSD: **11-28-74-10 w6m**

Equip Description: **Horizontal Inlet Separator**

Reg A#: **0433615**

Drawing #: **1**

	Nominal Thickness (mm)	Corrosion Allowance (mm)	Flag Thickness (mm)
<b>N7</b> Description: <b>Circ on 2" Nozzle</b> Date: Aug. 27, 24 Minimum: 8.6 Average: 8.9 Comments:	8.7	3.2	5.5
<b>N8</b> Description: <b>Circ on 6" Nozzle</b> Date: Aug. 27, 24 Minimum: 36.8 Average: 37.2 Comments:	21.9	3.2	18.7
<b>N9</b> Description: <b>Circ on 2" Nozzle</b> Date: Aug. 27, 24 Minimum: 8.4 Average: 8.7 Comments:	8.7	3.2	5.5
<b>N10</b> Description: <b>Circ on 2" Nozzle</b> Date: Aug. 27, 24 Minimum: 8.4 Average: 8.7 Comments:	8.7	3.2	5.5
<b>N11</b> Description: <b>Circ on 2" Nozzle</b> Date: Aug. 27, 24 Minimum: 8.4 Average: 8.7 Comments:	8.7	3.2	5.5