Mechanical/Piping/Electrical/Instrumentation (MPEI) Construction Summary – Rankin Inlet Tank Farm

- Primary MPEI construction contractor was NUQSANA PROMEC MINING
- Engineering firm for NUQSANA PROMEC MINING was ULTRAGEN
- All survey conducted by Hamel Arpentage

1. Marine pipeline requisite for filling tanks (August 17th to October 14th)

- Pipefitters welding pipe supports and placing on pads on slope to manifold.
- Fabricating pipe
- Filling marine line pipe for testing
- Tested marine line from east of tank farm to manifold (completed)
- Installing and welding piping marine line inside containment to tank 2
- Air pressure testing marine line And discharge to pump station.
- Re-tested marine line after replacement of flexible
- Installed blind after valve of tank 2 on marine line

2. Miscellaneous steel elements associated to pumping station(September 2nd to October 14th)

- backfilling trench for underground pipe
- Installing wire mesh in form ready to pour
- Installing concrete block and manifold on marine line
- Installing concrete pads for walkways
- Installing walkways over berm and piping
- Excavator and backfill electrical trench power line to manifold
- Set ventilation container (scrubber) on concrete blocks
- Installing 16'' ventilation pipe from vac c-can to #2 tank.
- Installing stairs to electrical and pump container
- Welding 16'' flange on ventilation pipe
- Painting inside ventilation building
- Working on securing electrical tray welding reinforcement
- Anchor Catwalk
- Close opening on ventilation building
- Ventilation dock to install on building
- Paint touch up
- Install 16" flexible on scrubber

3. Piping interrelated to pumping station (September 16th to October 21st)

- Moving pipe and fitting in preparation to start work for tank 2
- Assembling and welding piping south of tank 2
- Assembling and welding piping combustible area
- Assembling and welding piping north of tank 2
- Welding piping combustible area
- Assembling and welding piping discharge line to pump station north of tank 2
- Installing pressure release valve piping on tank

- Install labeling on valves
- Installed pipe support at pump station building

- Torking bolts piping
- Install gauge at pumping station
- Install 2”drain valve that was missing (Completed)

4. Electrical construction 2017 (September 16th to October 21st)

- Prep work: relocating C-Can with electrical materiel
- Installing grounding east and north of tank containment
- Electrician installs cable tray, pulling wire and connection wires
- Electrician installing ground wire
- Tag installation on electrical
- Finish installation strobe
- Electricians working on installing meter for permanent power

5. Testing - Rankin Inlet Site (September 2nd to October 14th)

- Testing and connection wires sea–can container

- Pipefitters assisting tanker unloading

Equipment Used for Construction (NUQSANA PROMEC MINING):

- Excavator
- Sky Track

QA/QC Summary

1. Non destructive examination; an magnetic particles inspection was conducted on socket weld and was accepted and conform to the standard. These inspections were done by MISTRAS firm.
2. Piping testing and cleaning; Air pressure test and water pressure water were done by NUQSANA PROMEC MINING on all the fuel line. After that, the cleaning were done with the pigging
3. Fire Protection; Automatic dry chemical fire suppression are installed as defined by the NFPA Standard for Dry Chemical Extinguishing Systems, NFPA-17.
4. As built drawings; Red line have been done on the isometric drawing
5. Refer to annexe O, section 6 and 7

APPENDIX H

Inspection Report – Inspection Test Plan

MTKSL

INSPECTION TEST PLAN

PROJECT:	AGNICO EAGLE MINES (AEM) –CIVIL WORKS – RANKIN LAYDOWN		
Contractor:	MTKSL		
Area/System No.:	Fuel Farms	Contract/Job No.:	6515-C-235-005
		ITP No.:	MTKSL_ITP_C005_001 20170630
Contact Person:	MTKSL – Mike Price		
Work Area:	Rankin Fuel Farm (RFF)		
Subcontractor:	Texel (Liner), Hamel (Survey), AEM Field Engineering (Materials Testing)		
CWP No.:	6515-C-235-005 – Civil Works – Rankin Laydown	EWP No.:	N/A

Verification Type				AEM Job Titles	
H:	Hold Point	T:	Test	CC	Construction Coordinator
I:	Inspection	V:	Verify Test Results	FE	Field Engineer
R:	Review Documentation	W:	Witness / Report	QA	Quality Assurance Representative

ACTIVITY DATA							VERIFICATION DATA[4]											
								Subcontractor QC			General Contractor QC			AEM				
No.	Description of Activities[1] (Describe in sequential order. Sequence must align with the execution sequence of the work to be performed.)	Functional[2] Responsibility	Characteristic (s)[3]	Verification[3] Frequency	Reference Document(s)	Acceptance Criteria	Verification[3] Document(s) (Reporting)	Type	Initials	Date	Type	Initials	Date	Type	Initials	Date	Title	Comments
1	IFCs Approved (Issued for Construction)	AEM / MTKSL	Verify all IFCs are approved and correct	Prior to Construction and ongoing	Issued IFCs	Stamped IFC Drawings and latest revisions	Drawing Log; AEM Transmittal	H			H	WA	July 17 2017	R	SC	17/07/17	GF	No work to proceed without Approved IFC Drawings issued fromAEM Document Control ,Void older revisions
2	Materials Production	AEM/MTKSL	Material Acceptance	As required	Technical Specs	Passing material gradation	Sieve Analysis	N/A			H	WA	July 17 2017	RW	JP	29/7/17	RE	Sieve Analysis and moisture content testing. QC Testing by AEM.
3	Materials Assignment	AEM	Material Acceptance	Ongoing	Site Standards	Material suitability	Material Balance & Assignment Sheet	N/A			H	WA	July 17 2017	W	SC	17/07/17	GF	Materials sources for construction materials to be dictated by AEM.
4	Survey Layout	HAMEL	Layout area of construction	As required	Issued IFC's	Conforms to IFC's.	Survey Layout Report	V			H	WA	17/07/17	R	SC	17/07/17	GF	Survey provided by AEM (Hamel)
5	Site Preparation	MTKSL	Ensure site is acceptable for placement	Once	IFCs, Site Standards, Technical Specs	Conforms to IFCs and Technical specs	Release for backfill / Stripping Report	V			R/I	WA	17/07/17	W	SC	17/07/17	GF	OG Surface to be surveyed prior to fill placement.
6	Placement of Material <600mm	MTKSL	Monitoring placement of materials	As required	IFCs, Site Standards, Technical Specs	Conforms to IFCs and Technical specs	Back Fill Report	V			R	WA	17/07/17	RW	SC	17/07/17	GF	Density testing by AEM. Survey by Hamel. Lift to be released by QA.
7	Placement of Material <200mm	MTKSL	Monitoring placement of materials	As required	IFCs, Site Standards, Technical Specs	Conforms to IFCs and Technical specs	Back Fill Report	V			R	WA	17/07/17	RW	SC	17/07/17	GF	Density testing by AEM. Survey by Hamel. Lift to be released by QA.
8	Placement of Material <30mm – Under liner	MTKSL	Monitoring placement of materials	As required	IFCs, Site Standards, Technical Specs	Conforms to IFCs and Technical specs	Back Fill Report	V			R	WA	17/07/17	RW	SC	17/07/17	GF	Density testing by AEM. Survey by Hamel. Moisture condition as required. Lift to be released by QA.

MTKSL

INSPECTION TEST PLAN

full liner placement

9	Placement of Liner	MTKSL/Texel	Monitoring placement of materials & verification	Ongoing	Manufacturers Specs, Technical Specs	Conforms to Manufacturers Specs, Install SOP, Technical Specs	Liner Installation Report	V	Only under tanks		VIR	WA	17/07/17		SG	17/07/17	CF RE	Liner ITP to be submitted separately.
10	Placement of Material <30mm – Over Liner	MKTSL	Monitoring placement of materials	As required	IFCs, Site Standards, Technical Specs	Conforms to IFCs and Technical specs	Back Fill Report	V	Only under tank pads		R	MG	17/08/17	RW	CB	17-08-17		
11	Placement of Sand – Under Tank	MTKSL	Monitoring placement of materials	As required	IFCs, Site Standards, Technical Specs	Conforms to IFCs and Technical specs	Back Fill Report	V			R	JW	17/07/17	RW	CB	17-07-17	GF	Track pack liner cover.
12	As built summary	AEM/MTKSL /HAMEL	Verify construction against IFC's	Once	Issued IFC's & Approved Field Changes	Conforms to IFC's & Approved Field Changes	Survey report & cleared ECN log	H			H	JC	10-10-17	RW	CB	17-10-17	GF	Survey to be completed as each material change or area
13	Walkdowns & Deficiency Correction	AEM/MTKSL	Verification	As Required	Asbuilt summary, IFCS, Field Changes	Conforms to IFC's & Approved Field Changes	Cleared Punch Log	N/A			H	JC	10-19-17	RW	CB	17-10-17	GF	
14	Final acceptance and turnover	AEM/MTKSL	Acceptance of final turnover	Once	Issued IFC's, Technical Specs	Conforms to IFCs, Technical Specs, Field Changes	Final Acceptance	H			H	JC	10-19-17	RW	CB	17-10-17	GF	

Comments:

Applicable Site Standard XXXXX-XXXXX

Applicable Technical Specification - 6515-GNS-014_R2.

ITP ISSUE APPROVALS

Jim Cavdinol Contractor Construction Manager / Superintendent (Print)	Construction Foreman Title	 Signature	16-22-17 Date (mm/dd/yy)
 Contractor Site Quality Manager / Supervisor (Print)	Owner Title	 Signature	 Date (mm/dd/yy)
CLEM BONITA AEM Quality Manager / Supervisor (Print)	GENERAL SUPERVISOR Title	 Signature	2017-10-25 Date (mm/dd/yy)

ITP CLOSEOUT AND WORK ACCEPTANCE APPROVALS

Jim Cavdinol Contractor Site Quality Manager / Supervisor (Print)	CONSTRUCTION FOREMAN Title	 Signature	10-22-017 Date (mm/dd/yy)
CLEM BONITA AEM Quality Manager / Supervisor / Designate (Print)	GENERAL SUPERVISOR Title	 Signature	2017-10-25 Date (mm/dd/yy)

APPENDIX I

Inspection Report – Handover Package for Tank #2

Handover Package Tank 2 – 13,500CUM

AEM PURCHASE ORDER: OC-568510
AEM PACKAGE NO.: 6515-C-260-002
PACKAGE TITLE: FUEL TANKS (SUPPLY & INSTALL)
TANK LOCATION: RANKIN INLET

ICL Project No.: 295
ICL Document No.: 295-H2
AEM Document No.: 6515-C-260-002-141-QCR-0002_Sub001
Revision: 0

OWNER:

Agnico Eagle Mines Limited
145 King St. East, Suite 400,
Toronto, Ontario M5C 2Y7

GENERAL CONTRACTOR:

Inukshuk Construction Limited
PO Box 654
Rankin Inlet NU
X0C 0G0

Contact: David Mosher

PH: (867) 645-4030
FX: (902) 429-7762

Submitted by: Inukshuk Construction Limited
Submitted: October 30, 2017

AGNICO EAGLE

Vendor Document Status

1 ☐ Proceed to next submission and status.

2 ☐ Proceed with exceptions as noted to next submission and status.

3 ☐ Do not proceed.
Revise as noted and resubmit next submission and status.

4 ☑ Complete, no further submission required.

By: Date:

Review and authorization to fabricate are only for general conformance with the design concept of the Project as expressed in the Contract Documents. Sole responsibility for the accuracy and completeness of this document, including but not limited to dimensions and quantities, remains with the Supplier/Contractor. Agnico Eagle does not warrant the accuracy or completeness of any of the information contained herein, nor does Agnico Eagle authorize or approve any construction means, methods, techniques, sequences or any safety precautions or procedures.

Agnico Eagle No. 6515-C-260-002-141-QCR-0002 R: Sub001

DOCUMENT FOR INFORMATION

Preamble:

This package contains all QA/QC documents and drawings for the field erected fuel storage tank. The Inspection and Test Plan (ITP) serves as a Table of Contents for the Handover Package. The contents have been divided into items 1-20, and a table of contents for each item of the ITP can be found at the beginning of each section (item). The As-Built Drawings can be found at the end of this package.

This package was compiled by the General Contractor: **Inukshuk Construction Ltd.** and reviewed by Mechanical Engineer: **Kyle Brown**.

INSPECTION & TEST PLAN

Client:	AGNICO EAGLE	**Tank Tag:**	TK# 2	**Document:**	TK #2 ITP
Project ID:	MELIADINE GOLD MINE	**Work Order:**	2955	**Revision:**	0

Item	Component	Activity	ITP Type	Documentation	Acceptance Criteria	Notes	Witness, Hold, Review Points	
							Client Sign/Date	Q.C. Sign/Date
1	Kick-Off Meeting	Kickoff Meeting	N/A	Meeting Minutes	N/A			H
2	Signature Log	Verify	N/A	Signature Log	N/A			H
3	Welder Qualification	Verify	N/A	Individual Welder Qualifications / Welder Log	API-650 / ASME IX			H
4	Inspector Qualification	Verify	N/A	In house Inspector & 3rd Party Qualifications	API-650			H
5	Weld Procedures	Verify	N/A	Approved Weld Procedures	API-650 / ASME IX, CWB W47.1			H
6	Welding Consumable	Electrode Storage	N/A	N/A	Manufacturer's Instructions			R
7	Foundation	Foundation Survey	DC	Foundation Acceptance Report, Compaction Report & Survey from 3rd Party	API-650 Para 7.5.5			H
8	Floor	Materials	FI	MTR Confirmation to Dwg	Drawing & API-650 Sect. 4	MTR of all plate under shell.		
		Fit up	VE, DC	As Built Drawing	Drawing	per API-650 5.1.5.4 - bottom plates under the shell shall have the outer ends of the joints fitted and lap-welded to form a smooth bearing surface.		R
		Welding	VE	Weld Map, Visual Report	API–650 Para 7.2 & 8.5 & WPS			R
		Vacuum Test	VB	Vacuum Box Test Report	API-650 Para 7.3.3(a) & 8.6			W
9	Shell to Floor Seams	Initial Weld Pass	VE	Weld Map, Visual Report	API-650 Para 8.5, 7.2.4.1			R
		Final Weld Pass	VE	Weld Map, Visual Report	API-650 Para 8.5, 7.2.4.1			R
		Diesel Test	NDT	Leak Test Report	API-650 Para 7.2.4.1 d)			W
10	Shell	Materials	FI	MTR Confirmation to Dwg	Drawing & API-650 Sect. 4	MTR of all plate		H
		Fit up 1st Course	VE, DC	As Built Drawing	Drawing			R
		Roundness	DC	Dimension Report	API-650 Para 7.5.3			H
		Welding	VE	Weld Map, Visual Report	API–650 Para 7.2, 7.5, 8.5 & WPS			R
		Tolerance Check – Plumbness & Local Deviations	DC	Dimension Report	API-650 Para 7.5			H
		Diesel Test Shell Welds	NDT	Leak Test Report	API-650 Para 7.3.6 2)a)i)			W
		UT – All Shell	NDT	UT report / Log / Map	API-650 Para Annex U	Shell less than 3/8" shall be intrepreted as 3/8" as a modification of API-650. All T joint UT.		H
11	Compression Ring	Fit up	VE, DC	As Built Drawing	Drawing			R
		Welding	VE	Weld Map, Visual Report	API–650 Para 7.2 & 8.5 & WPS			R
12	Roof	Fit up	VE, DC	As Built Drawing	Drawing			R
		Welding	VE	Visual Report	API–650 Para 7.2 & 8.5 & WPS			R
13	Roof Structure	Fit up	VE, DC	As Built Drawing	Drawing			R
		Column Plumbness	DC	Dimension Report	API–650 Para 7.5.2 b)			H
		Welding	VE	Visual Report	API–650 Para 7.2 & 8.5 & WPS			R

Item	Component	Activity	ITP Type	Documentation	Acceptance Criteria	Notes	Witness, Hold, Review Points	
							Client Sign/Date	Q.C. Sign/Date
14	Nozzles	Layout	VE, DC	As Built Drawing	Drawing			H
		Fit up	VE, DC	As Built Drawing	Drawing			R
		Welding	VE	Weld Map, Visual Report	API–650 Para 7.2 & 8.5 & WPS			R
		Tolerance Check – Plumbness & Local Deviations	DC	Dimension Report	API-650 Para 7.5			H
		Shell Nozzle Repad Air test	AT	Leak Test Report	API-650 Para 7.3.5			W
		MPI	NDT	MPI Report	API-650 Para 7.2.3.6	All welds of Shell Nozzles		W
15	Manway	Layout	VE, DC	As Built Drawing	Drawing			H
		Fit up	VE, DC	As Built Drawing	Drawing			R
		Welding	VE	Weld Map, Visual Report	API–650 Para 7.2 & 8.5 & WPS			R
		Tolerance Check – Plumbness & Local Deviations	DC	Dimension Report	API-650 Para 7.5			H
		Shell Manway Repad Air test	AT	Leak Test Report	API-650 Para 7.3.5			W
		MPT	NDT	MPI Report	API-650 Para 7.2.3.6	All welds of Shell Manways		R
16	Internals	Layout / Fit up	VE, DC	As Built Drawing	Drawing			R
		Welding	VE	Visual Report	API–650 Para 7.2 & 8.5 & WPS			R
		Stillwell Plumbness	DC	Dimension Report	API–650 Para H.4.5	N/A		R
		MPI or LP	NDT	NDT Report	Sump Welds (if applicable) 7.3.4	MPI all welds		H
17	Externals	Layout / Fit up	VE, DC	As Built Drawing	Drawing			R
	Externals	Welding	VE	Visual Report	API–650 Para 7.2 & 8.5 & WPS			R
18	Stairs & Platforms	Fit up	VE, DC	As Built Drawing	Drawing			R
		Welding	VE	Visual Report	API–650 Para 7.2 & 8.5 & WPS			R
19	Bolts & Nuts	Inspection	VE, DC	As Built Drawing	Drawing	Bolt Torque		W
20	Final	Name Plate Verification	N/A	Scan of Name Plate	Drawings			H
		Final Inspection	FI	As Built Drawings, Data Sheet, Manufacturer's Certification (3rd Party), Punch List	Drawings			H

DEFINITIONS:

W - WITNESS: Specified activity to be observed by an outlined party. QC to provide the applicable party 24 hours notice of witness point.

H - HOLD: Specified component or installation to be inspected by an outlined party. No further activities specific to the component or installation may proceed until inspection is carried out. QC to provide the applicable party 24 hours notice of hold point.

R - REVIEW: Specified documentation and specifications applicable to a particular component and/or installation to be examined by an outlined party.

AT - AIR TEST: Specified component and/or installation to be air tested according to specified documentation and specifications.

DC - DIMENSION CHECK: Physical dimensions of component and/or installation to be verified according to specified documentation and specifications.

FI - FINAL INSPECTION: Specified inspection procedures to be executed prior to release of the component and/or installation and verified according to specified documentation and specifications.

NDT - NON DESTRUCTIVE TESTING: Specified component and/or installation to be inspected using a named non destructive testing method according to specified documentation and specifications.

VE - VISUAL Examination: Specified component and/or installation to be examined visually according to specified documentation and specification.

VB - VACUUM-BOX TEST: Specified component and/or installation to be vacuum box tested according to specified documentation and specifications.

Item 1 – Kickoff Meeting Minutes

Contents

AGNICO EAGLE

Meliadine Project
Agnico Eagle Mines

Date: 27 January, 2017

Location: 842, WSP Office Montreal

Contract No. 6515-C-260-002

Scope of Work: Fuel Tanks

Meeting Notes Number: Kickoff Meeting 001

Issue Date: 31 January, 2017

Distribution:

AEM	*Inukshuk Construction*
* Diane Derome	+ Marc Losier
+ Normand Menard	+ Tony King
+ Joel Morlière	+ Jacob Saunders
++ Pierre Cianni	
++ Jack Dutil	
++ Mathieu Grenier	
++ Denis Duquette	

*Legend: * Author + Attendee ++ Part-time # Teleconference*

Item No.	Discussion / Decision	Action By	Required Date
1,0	**INTRODUCTION** The purpose of this meeting is to kick-off the Engineering and Fabrication portions of Contract No.6515-C-260-002 "Field Erected Fuel Tanks – Supply & Install" with Inukshuk Construction Inc. hereinafter referred to as ICL.	Info	
2.0	**HSE & CONSTRUCTION**		
2.1	**AEM Construction contact** :		

Name	Position	Email	Phone
Jack Dutil	Construction Manager	jack.dutil@agnicoeagle.com	T: 819.759.3555 x 3957 M: 819.354.9081

2.2	**AEM's HSE Contact** : will be determined during the Construction Meeting to come prior to Mobilization.	Info	
2.3	**Workers Inductions** - E-learning: It is a mandatory requirement for all workers to complete the induction prior to working at Site. Induction forms can be obtained by Denis Duquette at denis.duquette@agnicoeagle.com.	Info	
2.4	**Risk Register & Risk Mitigation**: Prior to mobilization at Site the Contractor will need to develop a risk register identifying the major risk associated with the Work. A mitigation plan shall be developed to minimize the identified risks.	Info	Prior to Mob

AGNICO EAGLE

Meliadine Project
Agnico Eagle Mines

Item No.	Discussion / Decision	Action By	Required Date
2.5	**HSE Manual:** Contractor to submit a Work specific HSE Manuel including JSA's for review and Approval by AEM. The HSE Manual must be approved prior to mobilization at Site.	Info	Prior to Mob
2.6	**Working hours –** ICL Working hours are 12hrs/ day on two (2) shifts. ICL will be required to request from the WSCC an extended work hour permit. Instruction provided in the Supplemental Conditions.	ICL	Prior to Mob
2.7	**Workers Rotation** – 6 weeks on 2 weeks off.	Info	
2.8	**Hydro Testing –** The API requests hydrotesting if water is accessible. Therefore, hydro tests can be performed on the tanks in Rankin. ICL suggest that AEM proceed immediately with the water Permit Acquisition since the delay is 6-8 months to obtain permit from the water board.	AEM	URGENT
2.9	**Liquid penetration testing –** Is possible only when water is not accessible.	Info	
2.10	**Workers Accommodations –** Workers accommodations in Rankin are the Contractor's responsibility. Workers accommodations at Meliadine Site are AEM's responsibility	Info	
3.0	**LOGISTICS (MATERIAL AND EQUIPMENT)** AEM Contact shall be:		

Name	Position	Email	Phone
Martin Ouellet	Expediting Coordinator	martin.ouellet@agnicoeagle.com	M:514-703-9569
Mathieu Grenier	Lead Logistics Coordinator	mathieu.grenier@agnicoeagle.com	T: 819.759.3700 x 2924 M: 819.856.3046
Cathrine Carmantrand	Expediting and logistics coordinator	Catherine.Carmantrand@wspgroup.com	T : 514.343.0773 X 6072

3.1	**Package Identification**: All deliveries to Becancour must have the PO number clearly identified.	Info	
3.2	**Packaging and Shipping**: The packaging of material and equipment must be in compliance with AEM Packaging and Shipping Instructions. If packaging is not in accordance to the instructions, AEM will backcharge any costs associated with double handling and repackaging.	Info	
3.3	**Start of Shipping**: ICL can commence shipping as early as	Info	

AGNICO EAGLE

Meliadine Project
Agnico Eagle Mines

Item No.	Discussion / Decision	Action By	Required Date
	April.		
3.4	**Shipping Priorities**: Three (3) vessels are scheduled in July. Shipping priorities will need to be identified by ICL and communicated to AEM including dimensions and weights of bundles, skids and containers. ICL confirms that the priorities will be the floor shell plates and columns.	ICL	
3.5	**Logistic Meeting**: A Logistic meeting will be scheduled at the beginning March to identify shipping priorities.	Diane / Mathieu G.	Early-March
3.6	**Transport of X-ray machine for weld testing**: It will be very complicated for AEM to transport and store an x-ray machine at Site due to the radioactive content within the machine. AEM requests that ICL consider ultra-sonic testing as an alternative method. ICL to confirm this alternative is in compliance with API Standards.	ICL	
3.7	**Material Packing**: ¼" thick shell plate will be delivered in sections of 10' wide x 40' long. Shell plates will be mounted on skids. **POST MEETING NOTE: AEM confirms that these dimensions are acceptable for shipping.**	Info	
3.8	*Material Management and handling at site* AEM Contact shall be: **Name** / **Position** / **Email** / **Phone** Denis Duquette / Site Material & Logistics / denis.duquette@agnicoeagle.com / T: 819-759-3700 x 5616 M: 819.339.8134		
3.9	**Material Requisitions**: Once the Material has arrived at Site, ICL will be responsible for their own Material Requisitions. Additional details on the procedure to come.	Info	
4.0	**ENGINEERING & DELIVERABLES** AEM Contact shall be: **Name** / **Position** / **Email** / **Phone** Joel Morliere / Package Coordinator / Joel.Morliere@wspgroup.com / 438-843-7585 Normand Menard / Lead Mechanical AEM / Normand.menard@agniceagle.com / 418-454-0464 Denis Thibodeau / Lead Package Engineer / Denis.Thibodeau@wspgroup.com / 438-843-7442		
4.1	Issued for Construction drawings : AEM will be releasing the IFC's the week of Feb 1st. Changes include: -Re-numbering of tanks	AEM	Feb 1st

AGNICO EAGLE

Meliadine Project
Agnico Eagle Mines

Item No.	Discussion / Decision	Action By	Required Date
	-Manhole on roof 600mm dia. - Revised paint spec (Already considered in pricing)		
4.2	*Technical documents and shop drawings submittals & approval*		
4.2.1	**DOCUMENTS SUBMITTAL** AEM Contact shall be: **Name** | **Position** | **Email** | **Phone** Giovanni Cianni | Lead Document Control | giovanni.cianni@agnicoeagle.com | M: 438-396-3886		
4.2.2	*Submittals* All VDT required documents have to be submitted through iPas DM for AEM's review and approval as per AEM's codification and submittal process.		info
4.2.3	*Approvals* AEM will review and return the documents within ten (10) working days.		Info
4.2.4	*iPasDM training* ICL to coordinate a training session with Giovanni Clanni, (Document Control Lead) on the uploading of documents		Info
4.2.5	*Requests For Information (RFIs)* All Engineering and technical questions have to be submitted through RFIs (See attached RFI Template). RFIs have to include a comprehensive level of detail to allow a quick reply and include potential cost or schedule impacts if any. Any potential schedule or Cost impact resulting from a RFI reply is to be sent formally to AEM through a CCR. RFIs to be sent to the Package Engineer, copy the Contract Administrator and Document Control.		Info
4.2.6	*Vendor Data Requirements Table (VDT) Review* ICL must refer to the contract VDT for all technical document requirements.		Info
4.3	Tank Dimensions: Inukshuk has issued via e-mail the proposed diameters and height of the tanks. No design calculation were provided. AEM confirms that the dimensions will be communicated / coordinated with the Civil / foundation contractor.		Info

AGNICO EAGLE

Meliadine Project
Agnico Eagle Mines

Item No.	Discussion / Decision	Action By	Required Date
5.0	**QA/QC** AEM Contact shall be: **Name** | **Position** | **Email** | **Phone** Jean-Francois Tremblay | Lead Quality | Jean.Francois.Tremblay3@wspgroup.com | T: 418-368-6069		
5.1	*Quality Plan* ICL to submit their Project Specific QA/QC Plan through iPas DM.	Info	Prior to Mobilization
5.2	*ITPs* ICL to submit their ITP through iPas DM. One Project specific General ITP for Fabrication and Installation including hold points. Detailed ITPs will be developed during work execution.	Info	Info
5.3	*Working & Welding Procedures* ICL to submit their standard working and welding procedures through iPas DM prior to work start.	Info	Prior to Mobilization
5.4	*Quality Management Requirements Turnover Requirements* ICL to submit their Quality management system through iPas DM for approval by AEM. Turnover will be progressive. ICL to work on the documents and forms all along the project to allow a smooth contract close-out.	Info	Prior to Fabrication start
6.0	**SCHEDULE** AEM Contact shall be: **Name** | **Position** | **Email** | **Phone** Pierre Cianni | Lead Planner | pierre.cianni@agnicoeagle.com | T: 819.825.4711 x 8010 M: 709 899-1711		
8.1	**Foundation Completion Date** : AEM confirms that the foundations shall be completed by mid-July.	Info	
8.2	**Hydro testing of 13.5M L Tank** : 11 days is scheduled for hydro testing the 13.5M Liter tank. API has constraints on the filling and discharge rate (50K liters / hr max)	Info	
8.3	**Completion date for 13.5M L Tanks**: AEM confirms that the 13.5M L tanks must be ready for filling on **September 25th 2017**	Info	
8.4	*Progress and Reporting* ICL will submit their progress reports on a Monthly basis. AEM will be scheduling a Bi-weekly Progress meetings once the	Diane	

AGNICO EAGLE

Meliadine Project
Agnico Eagle Mines

<table>
<tr><th>Item No.</th><th>Discussion / Decision</th><th>Action By</th><th>Required Date</th></tr>
<tr><td></td><td>fabrication has started. First meeting to be confirmed.</td><td></td><td></td></tr>
<tr><td>9.0</td><td><u>COMMERCIAL</u>
AEM Contact shall be:
<table>
<tr><th>Name</th><th>Position</th><th>Email</th><th>Phone</th></tr>
<tr><td>Diane Derome</td><td>Formation CA</td><td>diane.derome@agnicoeagle.com</td><td>T: 438.843.7585</td></tr>
<tr><td>Steve Tauber</td><td>Site CA</td><td>steve.tauber@agnicoeagle.com</td><td>T: 819.759.3555 x 3964</td></tr>
</table></td><td></td><td></td></tr>
<tr><td>9.1</td><td>ICL to provide the Insurance certificate and latest WCB Letter of good standing.</td><td>ICL</td><td>Prior to Mobilization</td></tr>
<tr><td>9.2</td><td>Verbal Instructions
AEM indicated that while day to day coordination instructions are normal practice, verbal instructions will not be tolerated. All instructions are to be in writing should there be any changes to the schedule and/or the Scope of Work.</td><td>Info</td><td></td></tr>
<tr><td>9.3</td><td>Contract Site Changes and Change Management
<u>General: No work can be executed nor paid unless a formal Contract Change Order (CCO) is fully executed by both Parties. All the below are tools and mechanisms used to capture changes but do not constitute a formal change until it is incorporated in a CCO.</u></td><td>Info</td><td></td></tr>
<tr><td>9.4</td><td>Contract Change Order (CCO)
Is the formal and only modification to the contract signed by both parties, which must be mutually agreed upon to effect a change to the contract. A Contract Change Order describes the scope, price, schedule, method of payment for a change to the contract.</td><td>Info</td><td></td></tr>
<tr><td>9.5</td><td>Contract Change Request (CCR)
ICL can initiate a request for a Contract Change Order due to different site conditions, construction change or similar event justifying issuance of a Contract Change Order (See attached CCR Template).</td><td>Info</td><td></td></tr>
<tr><td>9.6</td><td>Progress Payment Certificate (PPC)
AEM will create the PPC (Progress Payment Certificate) Template and issue to ICL.
ICL to send the PPC for AEM's approval prior to sending the invoice.</td><td>Info</td><td></td></tr>
<tr><td>9.7</td><td>Contract Signature: The contract is in preparation and will be ready for signature during the second week of February.</td><td>Diane</td><td>Feb, 2017</td></tr>
</table>

AGNICO EAGLE

Meliadine Project
Agnico Eagle Mines

Accepted By:

Marc Losier
Dated:

Inukshuk Construction ld.

Diane Derome
Dated:

Agnico Eagle Mines Ltd.

Attachments: Distribution List, CCR Form, RFI Form

Item 2 – Signature Log

Contents

Exhibit 20a, Rev 0

SIGNATURE LOG

PRINT	SIGNATURE	COMPANY	DATE
Robert Hoffman		SAS	Sept 30/17.
Keith Breedon		SAS	
Matthew Mackenzie		SAS	
Matthew Turmel		SAS	SEPT 30/17.
Sebastien Ouellet		SAS	SEPT 30/17
Stephane Gionet		AEM	
Clem Bonia		AEM	
Chris Jaques	C Jaques.	SAS	Sept 30/17

Item 3 – Welder Qualification

Contents

ALL CAN INSPECTION SERVICES (2011) INC.

Report # G2339

9323-37 Avenue, NW, Edmonton, Alberta T6E 5N4
SHOP: 780-462-1072 OFFICE: 780-462-9797 FAX: 780-462-4664
EMAIL: shop@allcaninspection.com www.allcaninspection.com

Client:	**Sub Arc Systems**	Client Job #	**Welder Coupons**
Address:	17 Exploration Way, Devon	P.O. #	**Toby**
Contact: Name:	Toby	Date:	**June 21/17**
Phone:			
Work Location:	All Can Inspection Shop	Work Description:	C.JA

CODES
1. ASME B31.3 N/S
2. ASME B31.3 S/C
3. ASME Sec. VIII Div 1 UW51
4. ASME Sec. VIII Div. 1 UW52
5. CSA Z662
6. CSA Z662 (Sour)
7. API 650
8. Other:

NDE No:	Size & thickness Plus Code Max. reinforcement	Material	Code	IQI	Technique Number	Source Side of Object to Film Distance	Source to Object Distance	Number of Exposures	Welder ID	Discontinuity	Severity	Accept	Reject
			1 - 8	See Back	See Back	Inches	Inches				1 - 3	V	X
2G SMAW	5/8" SPOT	P1	7	2	RT-2	0.750	25.000	1	C.JA			V	
3G SMAW	5/8" SPOT	P1	7	2	RT-2	0.750	25.000	1	C.JA			V	
4G SMAW	5/8" SPOT	P1	7	2	RT-2	0.750	25.000	1	C.JA	P @ 0" & 7"	1	V	

LF - Lack of Fusion; IP - Incomplete Penetration; IC - Internal Concavity; BT - Burn Through; TI - Tungsten Inclusion; IU: Internal Undercut; EU: External Undercut; EP - Excessive Penetration; P - Porosity; S - Slag; HL - High-Low; C - Crack; AB - Arc Burn; HB - Hollow Bead

Severity: 1 = Slight, 2 = Medium, 3 = Severe (Reject)

RT Technician:	Gordon Thomas	CGSB Level:	2	Reg. # :	6	SNT-TC-1A Level:	III	SNT-TC-1A No:	6
RT Assistant # 1	Victoria Sarnecki			CEDO #:	21927	SNT-TC-1A Level:	I	SNT-TC-1A No:	21927
RT Assistant # 2				CEDO #:		SNT-TC-1A Level:		SNT-TC-1A No:	

IMPORTANT: See reverse side of this form for All Can Inspection Services (2011) Inc. LIMITED LIABILITY POLICY

Technician Signature — Date: June 21/17

Client Representative Signature — Evaluation Date

The above interpretation is a technical opinion, not a guarantee.
Client signature indicates acceptance of the report and results.

Clock tape marker and start arrow marked on weldment.
It is the customer's responsibility to map welds on drawings.

Film Make / Brand	AGFA	Film Class / Type:	1-D5
Screens Lead	Front 0.010"	Back 0.010"	One (no.) film per screen
Film Density in H & D:	Min. 2.0	Max. 4.0	
Penetrometer (IQI hole type) designation:	N/A	Recommended Max. U.G.:	0.20"
Source Isotope:	IRIDIUM-192 (Gamma)	Wall Viewing:	Single
Effective Focal Spot Size:	0.146 inches	Processing:	Automatic

RADIOGRAPHIC EXAMINATION REPORT

ALL CAN INSPECTION SERVICES (2011) INC.

Report # G2340

9323-37 Avenue, NW, Edmonton, Alberta T6E 5N4
SHOP: 780-462-1072 OFFICE: 780-462-9797 FAX: 780-462-4664
EMAIL: shop@allcaninspection.com www.allcaninspection.com

Client:	**Sub Arc Systems**	Client Job #	**Welder Coupons**
Address:	17 Exploration Way, Devon	P.O. #	**Toby**
Contact: Name:	Toby	Date:	**June 21/17**
Phone:			
Work Location:	All Can Inspection Shop	Work Description:	J.OV

CODES
1. ASME B31.3 N/S
2. ASME B31.3 S/C
3. ASME Sec. VIII Div 1 UW51
4. ASME Sec. VIII Div. 1 UW52
5. CSA Z662
6. CSA Z662 (Sour)
7. API 650
8. Other:

NDE No:	Size & thickness Plus Code Max. reinforcement	Material	Code	IQI	Technique Number	Source Side of Object to Film Distance	Source to Object Distance	Number of Exposures	Welder ID	Discontinuity	Severity	Accept	Reject
			1 - 8	See Back	See Back	inches	inches				1 - 3	√	X
2G SMAW	5/8" SPOT	P1	7	2	RT-2	0.750	25.000	1	J.OV	S & P @ 0", P @ 1 1/2" & 6"	2	√	
3G SMAW	5/8" SPOT	P1	7	2	RT-2	0.750	25.000	1	J.OV			√	
4G SMAW	5/8" SPOT	P1	7	2	RT-2	0.750	25.000	1	J.OV			√	

LF - Lack of Fusion
IP - Incomplete Penetration
IC - Internal Concavity
BT - Burn Through
TI - Tungsten Inclusion
IU: Internal Undercut
EU: External Undercut
EP - Excessive Penetration
P - Porosity
S - Slag
HL - High-Low
C - Crack
AB - Arc Burn
HB - Hollow Bead

Severity: 1 = Slight, 2 = Medium, 3 = Severe (Reject)

RT Technician:	Gordon Thomas	CGSB Level:	2	Reg. # :	6	SNT-TC-1A Level:	III	SNT-TC-1A No:	6
RT Assistant # 1	Victoria Sarnecki	CEDO #:	21927			SNT-TC-1A Level:	I	SNT-TC-1A No:	21927
RT Assistant # 2		CEDO #:				SNT-TC-1A Level:		SNT-TC-1A No:	

IMPORTANT: See reverse side of this form for All Can Inspection Services (2011) Inc. LIMITED LIABILITY POLICY

Technician Signature — June 21/17 Date

Client Representative Signature — Evaluation Date

The above interpretation is a technical opinion, not a guarantee.
Client signature indicates acceptance of the report and results.

Clock tape marker and start arrow marked on weldment.
It is the customer's responsibility to map welds on drawings.

Film Make / Brand	AGFA	Film Class / Type:	1-D5
Screens Lead	Front 0.010"	Back 0.010"	One (no.) film per screen
Film Density in H & D:	Min. 2.0	Max. 4.0	
Penetrometer (IQI hole type) designation:	N/A	Recommended Max. U.G.:	0.20"
Source Isotope:	IRIDIUM-192 (Gamma)	Wall Viewing:	Single
Effective Focal Spot Size:	0.146 inches	Processing:	Automatic

RADIOGRAPHIC EXAMINATION REPORT

ALL CAN INSPECTION SERVICES (2011) INC.

Report # G2341

9323-37 Avenue, NW, Edmonton, Alberta T6E 5N4
SHOP: 780-462-1072 OFFICE: 780-462-9797 FAX: 780-462-4664
EMAIL: shop@allcaninspection.com www.allcaninspection.com

Client: **Sub Arc Systems**
Address: 17 Exploration Way, Devon
Contact: Name: Toby
Phone:
Work Location: All Can Inspection Shop

Client Job # **Welder Coupons**
P.O. # **Toby**
Date: **June 21/17**
Work Description: M.GO

CODES
1. ASME B31.3 N/S
2. ASME B31.3 S/C
3. ASME Sec. VIII Div 1 UW51
4. ASME Sec. VIII Div. 1 UW52
5. CSA Z662
6. CSA Z662 (Sour)
7. API 650
8. Other:

LF - Lack of Fusion; IP - Incomplete Penetration; IC - Internal Concavity; BT - Burn Through; TI - Tungsten Inclusion; IU: Internal Undercut; EU: External Undercut; EP - Excessive Penetration; P - Porosity; S - Slag; HL - High-Low; C - Crack; AB - Arc Burn; HB - Hollow Bead
Severity: 1 = Slight, 2 = Medium, 3 = Severe (Reject)

NDE No:	Size & thickness Plus Code Max. reinforcement	Material	Code (1 - 8)	IQI (See Back)	Technique Number (See Back)	Source Side of Object to Film Distance (Inches)	Source to Object Distance (Inches)	Number of Exposures	Welder ID	Discontinuity	Severity (1 - 3)	Accept (√)	Reject (X)
2G SMAW	5/8" SPOT	P1	7	2	RT-2	0.750	25.000	1	M.GO	IU @ 1", IC @ 2" & 6"	1	√	
3G SMAW	5/8" SPOT	P1	7	2	RT-2	0.750	25.000	1	M.GO	P @ 4"	1	√	
4G SMAW	5/8" SPOT	P1	7	2	RT-2	0.750	25.000	1	M.GO	P @ 0"	1	√	

RT Technician: Gordon Thomas CGSB Level: 2 Reg. # : 6 SNT-TC-1A Level: III SNT-TC-1A No: 6
RT Assistant # 1 Victoria Sarnecki CEDO #: 21927 SNT-TC-1A Level: I SNT-TC-1A No: 21927
RT Assistant # 2 CEDO #: SNT-TC-1A Level: SNT-TC-1A No:

IMPORTANT: See reverse side of this form for All Can Inspection Services (2011) Inc. LIMITED LIABILITY POLICY

Technician Signature — Date: June 21/17

Client Representative Signature — Evaluation Date

The above interpretation is a technical opinion, not a guarantee.
Client signature indicates acceptance of the report and results.

Clock tape marker and start arrow marked on weldment.
It is the customer's responsibility to map welds on drawings.

Film Make / Brand: AGFA Film Class / Type: 1-D5
Screens Lead: Front 0.010" Back 0.010" One (no.) film per screen
Film Density in H & D: Min. 2.0 Max. 4.0
Penetrometer (IQI hole type) designation: N/A Recommended Max. U.G.: 0.20"
Source Isotope: IRIDIUM-192 (Gamma) Wall Viewing: Single
Effective Focal Spot Size: 0.146 inches Processing: Automatic

RADIOGRAPHIC EXAMINATION REPORT

ALL CAN INSPECTION SERVICES (2011) INC.

Report # G2342

9323-37 Avenue, NW, Edmonton, Alberta T6E 5N4
SHOP: 780-462-1072 **OFFICE:** 780-462-9797 **FAX:** 780-462-4664
EMAIL: shop@allcaninspection.com **www.allcaninspection.com**

Client:	**Sub Arc Systems**	Client Job #	**Welder Coupons**
Address:	17 Exploration Way, Devon	P.O. #	**Toby**
Contact: Name:	Toby	Date:	**June 21/17**
Phone:			
Work Location:	All Can Inspection Shop	Work Description:	M.TU

CODES
1. ASME B31.3 N/S
2. ASME B31.3 S/C
3. ASME Sec. VIII Div 1 UW51
4. ASME Sec. VIII Div. 1 UW52
5. CSA Z662
6. CSA Z662 (Sour)
7. API 650
8. Other:

NDE No:	Size & thickness Plus Code Max. reinforcement	Material	Code	IQI	Technique Number	Source Side of Object to Film Distance	Source to Object Distance	Number of Exposures	Welder ID	Discontinuity (LF - Lack of Fusion; IP - Incomplete Penetration; IC - Internal Concavity; BT - Burn Through; TI - Tungsten Inclusion; IU: Internal Undercut; EU: External Undercut; EP - Excessive Penetration; P - Porosity; S - Slag; HL - High-Low; C - Crack; AB - Arc Burn; HB - Hollow Bead) Severity: 1 = Slight, 2 = Medium, 3 = Severe (Reject)	Severity	Accept	Reject
			1 - 8	See Back	See Back	Inches	Inches				1 - 3	√	X
2G SMAW	5/8" SPOT	P1	7	2	RT-2	0.750	25.000	1	M.TU	P @ 0"	1	√	
3G SMAW	5/8" SPOT	P1	7	2	RT-2	0.750	25.000	1	M.TU			√	
4G SMAW	5/8" SPOT	P1	7	2	RT-2	0.750	25.000	1	M.TU	S @ 1" & 2", P @ 5"	2	√	

RT Technician:	Gordon Thomas	CGSB Level:	2	Reg. # :	6	SNT-TC-1A Level:	III
SNT-TC-1A No:	6						
RT Assistant # 1	Victoria Sarnecki	CEDO #:	21927	SNT-TC-1A Level:	I	SNT-TC-1A No:	21927
RT Assistant # 2		CEDO #:		SNT-TC-1A Level:		SNT-TC-1A No:	

IMPORTANT: See reverse side of this form for All Can Inspection Services (2011) Inc. LIMITED LIABILITY POLICY

Technician Signature — Date: June 21/17

Client Representative Signature — Evaluation Date

The above interpretation is a technical opinion, not a guarantee.
Client signature indicates acceptance of the report and results.

Clock tape marker and start arrow marked on weldment.
It is the customer's responsibility to map welds on drawings.

Film Make / Brand	AGFA	Film Class / Type:	1-D5
Screens Lead	Front 0.010"	Back 0.010"	One (no.) film per screen
Film Density in H & D:	Min. 2.0	Max. 4.0	
Penetrometer (IQI hole type) designation:	N/A	Recommended Max. U.G.:	0.20"
Source Isotope:	IRIDIUM-192 (Gamma)	Wall Viewing:	Single
Effective Focal Spot Size:	0.146 inches	Processing:	Automatic

RADIOGRAPHIC EXAMINATION REPORT

ALL CAN INSPECTION SERVICES (2011) INC.

Report # G2343

9323-37 Avenue, NW, Edmonton, Alberta T6E 5N4
SHOP: 780-462-1072 OFFICE: 780-462-9797 FAX: 780-462-4664
EMAIL: shop@allcaninspection.com www.allcaninspection.com

Client: **Sub Arc Systems** Client Job # **Welder Coupons**
Address: 17 Exploration Way, Devon P.O. # **Toby**
Contact: Name: Toby Date: **June 21/17**
Phone:
Work Location: All Can Inspection Shop Work Description: M.MA

CODES
1. ASME B31.3 N/S
2. ASME B31.3 S/C
3. ASME Sec. VIII Div 1 UW51
4. ASME Sec. VIII Div. 1 UW52
5. CSA Z662
6. CSA Z662 (Sour)
7. API 650
8. Other:

NDE No:	Size & thickness Plus Code Max. reinforcement	Material	Code	IQI	Technique Number	Source Side of Object to Film Distance	Source to Object Distance	Number of Exposures	Welder ID	Discontinuity (LF - Lack of Fusion; IP - Incomplete Penetration; IC - Internal Concavity; BT - Burn Through; TI - Tungsten Inclusion; IU: Internal Undercut; EU: External Undercut; EP - Excessive Penetration; P - Porosity; S - Slag; HL - High-Low; C - Crack; AB - Arc Burn; HB - Hollow Bead) Severity: 1 = Slight, 2 = Medium, 3 = Severe (Reject)	Severity	Accept	Reject
			1 - 8	See Back	See Back	Inches	Inches				1 - 3	√	X
2G SMAW	5/8" SPOT	P1	7	2	RT-2	0.750	25.000	1	M.MA			√	
3G SMAW	5/8" SPOT	P1	7	2	RT-2	0.750	25.000	1	M.MA			√	
4G SMAW	5/8" SPOT	P1	7	2	RT-2	0.750	25.000	1	M.MA	EU @ 2"	1	√	

RT Technician: Gordon Thomas CGSB Level: 2 Reg. # : 6 SNT-TC-1A Level: III SNT-TC-1A No: 6
RT Assistant # 1 Victoria Sarnecki CEDO #: 21927 SNT-TC-1A Level: I SNT-TC-1A No: 21927
RT Assistant # 2 CEDO #: SNT-TC-1A Level: SNT-TC-1A No:

IMPORTANT: See reverse side of this form for All Can Inspection Services (2011) Inc. LIMITED LIABILITY POLICY

Technician Signature — Date: June 21/17

Client Representative Signature — Evaluation Date

The above interpretation is a technical opinion, not a guarantee.
Client signature indicates acceptance of the report and results.

Clock tape marker and start arrow marked on weldment.
It is the customer's responsibility to map welds on drawings.

Film Make / Brand: AGFA Film Class / Type: D5
Screens: Lead Front: 0.010" Back: 0.010" One (no.) film per screen
Film Density in H & D: Min. 2.0 Max. 4.0
Penetrometer (IQI hole type) designation: N/A Recommended Max. U.G.: 0.20"
Source Isotope: IRIDIUM-192 (Gamma) Wall Viewing: Single
Effective Focal Spot Size: 0.146 inches Processing: Automatic

RADIOGRAPHIC EXAMINATION REPORT

ALL CAN INSPECTION SERVICES (2011) INC.

Report # G2344

9323-37 Avenue, NW, Edmonton, Alberta T6E 5N4
SHOP: 780-462-1072 OFFICE: 780-462-9797 FAX: 780-462-4664
EMAIL: shop@allcaninspection.com www.allcaninspection.com

Client:	**Sub Arc Systems**	Client Job #	**Welder Coupons**
Address:	17 Exploration Way, Devon	P.O. #	**Toby**
Contact: Name:	Toby	Date:	**June 21/17**
Phone:			
Work Location:	All Can Inspection Shop	Work Description:	Q.PO

CODES
1. ASME B31.3 N/S
2. ASME B31.3 S/C
3. ASME Sec. VIII Div 1 UW51
4. ASME Sec. VIII Div. 1 UW52
5. CSA Z662
6. CSA Z662 (Sour)
7. API 650
8. Other:

NDE No:	Size & thickness Plus Code Max. reinforcement	Material	Code	IQI	Technique Number	Source Side of Object to Film Distance	Source to Object Distance	Number of Exposures	Welder ID	Discontinuity	Severity	Accept	Reject
			1 - 8	See Back	See Back	Inches	Inches				1 - 3	√	X
2G SMAW	5/8" SPOT	P1	7	2	RT-2	0.750	25.000	1	Q.PO	IU @ 1", 2" & 6"	2	√	
3G SMAW	5/8" SPOT	P1	7	2	RT-2	0.750	25.000	1	Q.PO			√	
4G SMAW	5/8" SPOT	P1	7	2	RT-2	0.750	25.000	1	Q.PO			√	

LF - Lack of Fusion; IP - Incomplete Penetration; IC - Internal Concavity; BT - Burn Through; TI - Tungsten Inclusion; IU: Internal Undercut; EU: External Undercut; EP - Excessive Penetration; P - Porosity; S - Slag; HL - High-Low; C - Crack; AB - Arc Burn; HB - Hollow Bead

Severity: 1 = Slight, 2 = Medium, 3 = Severe (Reject)

RT Technician:	Gordon Thomas	CGSB Level:	2	Reg. # :	6	SNT-TC-1A Level:	III	SNT-TC-1A No:	6
RT Assistant # 1	Victoria Sarnecki	CEDO #:	21927			SNT-TC-1A Level:	I	SNT-TC-1A No:	21927
RT Assistant # 2		CEDO #:				SNT-TC-1A Level:		SNT-TC-1A No:	

IMPORTANT: See reverse side of this form for All Can Inspection Services (2011) Inc. LIMITED LIABILITY POLICY

Technician Signature — Date: June 21/17

Client Representative Signature — Evaluation Date

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Client signature indicates acceptance of the report and results.

Clock tape marker and start arrow marked on weldment.
It is the customer's responsibility to map welds on drawings.

Film Make / Brand	AGFA	Film Class / Type:	1-D5
Screens Lead	Front 0.010"	Back 0.010"	One (no.) film per screen
Film Density in H & D:	Min. 2.0	Max. 4.0	
Penetrometer (IQI hole type) designation:	N/A	Recommended Max. U.G.:	0.20"
Source Isotope:	IRIDIUM-192 (Gamma)	Wall Viewing:	Single
Effective Focal Spot Size:	0.146 inches	Processing:	Automatic

RADIOGRAPHIC EXAMINATION REPORT

ALL CAN INSPECTION SERVICES (2011) INC.

Report # G2345

9323-37 Avenue, NW, Edmonton, Alberta T6E 5N4
SHOP: 780-462-1072 OFFICE: 780-462-9797 FAX: 780-462-4664
EMAIL: shop@allcaninspection.com www.allcaninspection.com

Client: **Sub Arc Systems** Client Job # **Welder Coupons**

Address: 17 Exploration Way, Devon P.O. # **Toby**

Contact: Name: Toby Date: **June 21/17**

Phone:

Work Location: All Can Inspection Shop Work Description: D.ZU

CODES
1. ASME B31.3 N/S
2. ASME B31.3 S/C
3. ASME Sec. VIII Div 1 UW51
4. ASME Sec. VIII Div. 1 UW52
5. CSA Z662
6. CSA Z662 (Sour)
7. API 650
8. Other:

NDE No:	Size & thickness Plus Code Max. reinforcement	Material	Code	IQI	Technique Number	Source Side of Object to Film Distance	Source to Object Distance	Number of Exposures	Welder ID	Discontinuity (LF - Lack of Fusion; IP - Incomplete Penetration; IC - Internal Concavity; BT - Burn Through; TI - Tungsten Inclusion; IU: Internal Undercut; EU: External Undercut; EP - Excessive Penetration; P - Porosity; S - Slag; HL - High-Low; C - Crack; AB - Arc Burn; HB - Hollow Bead) Severity: 1 = Slight, 2 = Medium, 3 = Severe (Reject)	Severity	Accept	Reject
			1 - 8	See Back	See Back	Inches	Inches				1 - 3	√	x
2G SMAW	5/8" SPOT	P1	7	2	RT-2	0.750	25.000	1	D.ZU			√	
3G SMAW	5/8" SPOT	P1	7	2	RT-2	0.750	25.000	1	D.ZU			√	
4G SMAW	5/8" SPOT	P1	7	2	RT-2	0.750	25.000	1	D.ZU			√	

RT Technician: Gordon Thomas CGSB Level: 2 Reg. # : 6 SNT-TC-1A Level: III SNT-TC-1A No: 6

RT Assistant # 1 Victoria Sarnecki CEDO #: 21927 SNT-TC-1A Level: I SNT-TC-1A No: 21927

RT Assistant # 2 CEDO #: SNT-TC-1A Level: SNT-TC-1A No:

IMPORTANT: See reverse side of this form for All Can Inspection Services (2011) Inc. LIMITED LIABILITY POLICY

Technician Signature June 21/17 Date

Client Representative Signature Evaluation Date

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Client signature indicates acceptance of the report and results.

Clock tape marker and start arrow marked on weldment.
It is the customer's responsibility to map welds on drawings.

Film Make / Brand: AGFA Film Class / Type: 1-D5

Screens: Lead Front: 0.010" Back: 0.010" One (no.) film per screen

Film Density in H & D: Min. 2.0 Max. 4.0

Penetrometer (IQI hole type) designation: N/A Recommended Max. U.G.: 0.20"

Source Isotope: IRIDIUM-192 (Gamma) Wall Viewing: Single

Effective Focal Spot Size: 0.146 inches Processing: Automatic

RADIOGRAPHIC EXAMINATION REPORT

ALL CAN INSPECTION SERVICES (2011) INC.

Report # G2346

9323-37 Avenue, NW, Edmonton, Alberta T6E 5N4
SHOP: 780-462-1072 OFFICE: 780-462-9797 FAX: 780-462-4664
EMAIL: shop@allcaninspection.com www.allcaninspection.com

Client:	Sub Arc Systems	Client Job #	Welder Coupons
Address:	17 Exploration Way, Devon	P.O. #	Toby
Contact: Name:	Toby	Date:	June 21/17
Phone:			
Work Location:	All Can Inspection Shop	Work Description:	D.ZE

CODES
1. ASME B31.3 N/S
2. ASME B31.3 S/C
3. ASME Sec. VIII Div 1 UW51
4. ASME Sec. VIII Div. 1 UW52
5. CSA Z662
6. CSA Z662 (Sour)
7. API 650
8. Other:

NDE No:	Size & thickness Plus Code Max. reinforcement	Material	Code	IQI	Technique Number	Source Side of Object to Film Distance	Source to Object Distance	Number of Exposures	Welder ID	Discontinuity (LF - Lack of Fusion; IP - Incomplete Penetration; IC - Internal Concavity; BT - Burn Through; TI - Tungsten Inclusion; IU: Internal Undercut; EU: External Undercut; EP - Excessive Penetration; P - Porosity; S - Slag; HL - High-Low; C - Crack; AB - Arc Burn; HB - Hollow Bead. Severity: 1 = Slight, 2 = Medium, 3 = Severe (Reject))	Severity	Accept	Reject
			1 - 8	See Back	See Back	Inches	Inches				1 - 3	√	X
2G SMAW	5/8" SPOT	P1	7	2	RT-2	0.750	25.000	1	D.ZE	P @ 0"	1	√	
3G SMAW	5/8" SPOT	P1	7	2	RT-2	0.750	25.000	1	D.ZE			√	
4G SMAW	5/8" SPOT	P1	7	2	RT-2	0.750	25.000	1	D.ZE			√	

RT Technician:	Gordon Thomas	CGSB Level:	2	Reg. # :	6	SNT-TC-1A Level:	III	SNT-TC-1A No:	6
RT Assistant # 1	Victoria Sarnecki			CEDO #:	21927	SNT-TC-1A Level:	I	SNT-TC-1A No:	21927
RT Assistant # 2				CEDO #:		SNT-TC-1A Level:		SNT-TC-1A No:	

IMPORTANT: See reverse side of this form for All Can Inspection Services (2011) Inc. LIMITED LIABILITY POLICY

Technician Signature — Date: June 21/17

Client Representative Signature — Evaluation Date

The above interpretation is a technical opinion, not a guarantee.
Client signature indicates acceptance of the report and results.

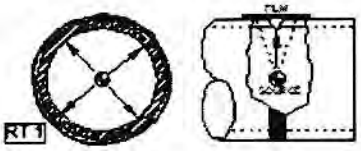
Clock tape marker and start arrow marked on weldment.
It is the customer's responsibility to map welds on drawings.

Film Make / Brand	AGFA	Film Class / Type:	I-D5
Screens Lead	Front 0.010"	Back 0.010"	One (no.) film per screen
Film Density in H & D:	Min. 2.0	Max. 4.0	
Penetrometer (IQI hole type) designation:	N/A	Recommended Max. U.G.:	0.20"
Source Isotope:	IRIDIUM-192 (Gamma)	Wall Viewing:	Single
Effective Focal Spot Size:	0.146 inches	Processing:	Automatic

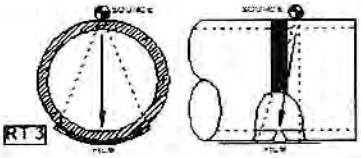
RADIOGRAPHIC EXAMINATION REPORT

RADIOGRAPHIC EXAMINATION TECHNIQUE REFERENCE SHEET

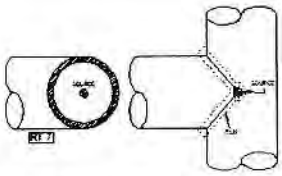
ALL CAN INSPECTION SERVICES (2011) INC. RT TECHNIQUES
ALL CAN **INSPECTION SERVICES (2011) INC. GENERAL RT PROCEDURE**
Important Note: Always check the QA/Procedures Manual for the most current Procedure Revision status.



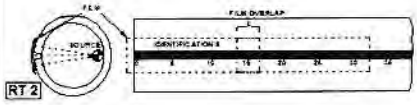
Tech #RT-1: Vessel Circumferential Weld
1 Exposure: QA Subsection 15.12.1



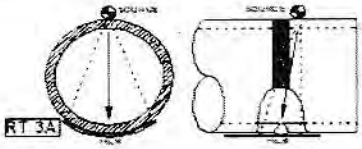
Tech #RT-3: Circ. Weld – Contact – Light Wall
3 Exposures@120° Spacing: QA Subsection 15.12.6



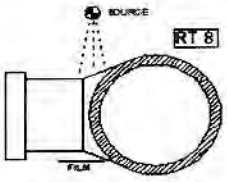
Tech #RT-7: Mitered "T" Joint - Single Wall - Source centered Exposures as required: *QA Subsection 15.12.11*



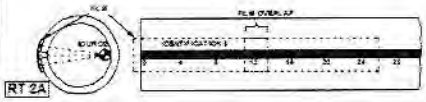
Tech #RT-2: Long. Weld - Light Wall – Source Inside
1 Exposure/15 inches: *QA Subsection 15.12.2*



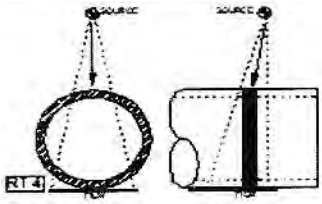
Tech #RT-3A: Circ. Weld – Contact – Heavy Wall
4 Exposures@90° Spacing: *QA Subsection 15.12.7*



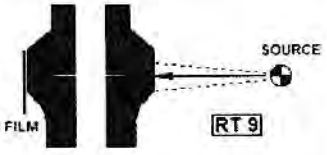
Tech #RT-8:Category "D" Weld
Exposures as required: *QA Subsection 15.12.12*



Tech #RT-2A: Long. Weld - Heavy Wall – Source Inside
1 Exposure/12 inches: *QA Subsection 15.12.3*

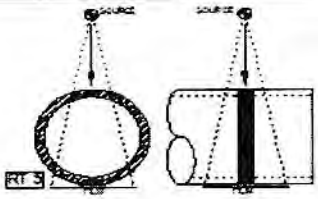


Tech #RT-4: Circ. Weld – Dbl Wall – Elipse
2 Exposures@90° Spacing: QA Subsection 15.12.8



Tech #RT-9: Gap Check
1 Exposure: *QA Subsection 15.12.13*

Tech #RT-2B: Long. Weld – Light Wall – Source Outside
1 Exposure/15 inches: *QA Subsection 15.12.4*



Tech #RT-5: Circ. Weld – Double Wall – Superimposed
3 Exposures@60° Spacing: QA Subsection 15.12.9

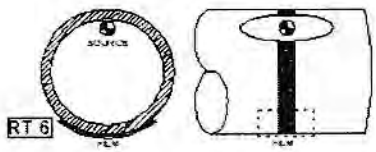
Penetrameter (IQI) Reference

1. ASTM A
2. ASTM B
3. ASTM C
4. FEEN/EN-462

5. DIN/EN-462 Set/Size 1 (Wire range 1 - 7)
6. DIN/EN 462 Set/Size 6 (Wire range 6 - 12)
7. DIN/EN-462 Set/Size 10 (Wire range 10 - 16)
8. DIN/EN-462 Set/Size 13 (Wire range 13 - 19)

9. Hole Type: Indicate IQI Designation Number

Tech #RT-2C: Long. Weld – Heavy Wall – Source Outside
1 Exposure/12 inches: *QA Subsection 15.12.5*



Tech #RT-6: Circumferential Weld - Source not Centered
Exposures as required: *QA Subsection 15.12.10*

IMPORTANT INFORMATION:

Scope of Services & Limits of Liability:

All Can Inspection Services (2011) Inc. does not warranty or imply warranty of services stated herein and shall not be held liable for services rendered as per established service agreements. At no time shall liability be placed upon All Can Inspection Services (2011) Inc. of which exceeds the amount paid for said services.

All Can Inspection Services shall utilize appropriate quality assurance measures, technical training, and safety parameters to assure services are provided to meet or exceed established NDE procedures, Practices and industry expectations and at no time shall warranty excess NDE services except those established in writing beyond those established prior to the services provided herein.

ALL CAN INSPECTION SERVICES (2011) INC.

Report # G2616

9323-37 Avenue, NW, Edmonton, Alberta T6E 5N4
SHOP: 780-462-1072 OFFICE: 780-462-9797 FAX: 780-462-4664
EMAIL: shop@allcaninspection.com www.allcaninspection.com

Client:	Sub Arc Systems	Client Job #	Coupon
Address:	17 Exploration Way, Devon	P.O. #	Toby
Contact: Name:	Toby	Date:	Aug 1/17
Phone:			
Work Location:	All Can Inspection Shop	Work Description:	Joe Niederhoff

CODES
1. ASME B31.3 N/S
2. ASME B31.3 S/C
3. ASME Sec. VIII Div 1 UW51
4. ASME Sec. VIII Div. 1 UW52
5. CSA Z662
6. CSA Z662 (Sour)
7. API 650
8. ASME IX (QW-191.2)

LF - Lack of Fusion; IP - Incomplete Penetration; IC - Internal Concavity; BT - Burn Through; TI - Tungsten Inclusion; IU: Internal Undercut; EU: External Undercut; EP - Excessive Penetration; P - Porosity; S - Slag; HL - High-Low; C - Crack; AB - Arc Burn; HB - Hollow Bead

Severity: 1 = Slight, 2 = Medium, 3 = Severe (Reject)

NDE No:	Size & thickness Plus Code Max. reinforcement	Material	Code (1 - 8)	IQI (See Back)	Technique Number (See Back)	Source Side of Object to Film Distance (inches)	Source to Object Distance (inches)	Number of Exposures	Welder ID	Discontinuity	Severity (1 - 3)	Accept (√)	Reject (√)
SAW 2G - Retest	5/8" Spot	P1	8	2	RT-2	0.750	25.000	1	J.NI			√	

RT Technician: Gordon Thomas CGSB Level: 2 Reg. #: 6 SNT-TC-1A Level: III SNT-TC-1A No: 6

RT Assistant # 1 CEDO #: SNT-TC-1A Level: SNT-TC-1A No:

RT Assistant # 2 CEDO #: SNT-TC-1A Level: SNT-TC-1A No:

IMPORTANT: See reverse side of this form for All Can Inspection Services (2011) Inc. LIMITED LIABILITY POLICY

Technician Signature — Date: Aug 1/17

Client Representative Signature — Evaluation Date

The above interpretation is a technical opinion, not a guarantee.
Client signature indicates acceptance of the report and results.

Clock tape marker and start arrow marked on weldment.
It is the customer's responsibility to map welds on drawings.

Film Make / Brand	AGFA	Film Class / Type:	I-D5
Screens Lead	Front: 0.010"	Back: 0.010"	One (no.) film per screen
Film Density in H & D:	Min. 2.0	Max. 4.0	
Penetrometer (IQI hole type) designation:	N/A	Recommended Max. U.C.:	0.30"
Source Isotope:	IRIDIUM-192 (Gamma)	Wall Viewing:	Single
Effective Focal Spot Size:	0.146 inches	Processing:	Automatic

RADIOGRAPHIC EXAMINATION REPORT

ALL CAN INSPECTION SERVICES (2011) INC.

Report # G2615

9323-37 Avenue, NW, Edmonton, Alberta T6E 5N4
SHOP: 780-462-1072 OFFICE: 780-462-9797 FAX: 780-462-4664
EMAIL: shop@allcaninspection.com www.allcaninspection.com

Client:	Sub Arc Systems	Client Job #	Coupon
Address:	17 Exploration Way, Devon	P.O. #	Toby
Contact: Name:	Toby	Date:	Aug 1/17
Phone:			
Work Location:	All Can Inspection Shop	Work Description:	Matt Mackenzie

CODES
1. ASME B31.3 N/S
2. ASME B31.3 S/C
3. ASME Sec. VIII Div 1 UW51
4. ASME Sec. VIII Div. 1 UW52
5. CSA Z662
6. CSA Z662 (Sour)
7. API 650
8. ASME IX (QW-191.2)

NDE No:	Size & thickness Plus Code Max. reinforcement	Material	Code	IQI	Technique Number	Source Side of Object to Film Distance	Source to Object Distance	Number of Exposures	Welder ID	Discontinuity	Severity	Accept	Reject
			1 - 8	See Back	See Back	Inches	Inches			Severity: 1 = Slight, 2 = Medium, 3 = Severe (Reject)	1 - 3	√	X
SAW 2G	5/8" Spot	P1	8	2	RT-2	0.750	25.000	1	M.MA			√	

LF - Lack of Fusion; IP - Incomplete Penetration; IC - Internal Concavity; BT - Burn Through; TF - Tungsten Inclusion; IU: Internal Undercut; EU: External Undercut; EP - Excessive Penetration; P - Porosity; S - Slag; HL - High-Low; C - Crack; AB - Arc Burn; HB - Hollow Bead

RT Technician:	Gordon Thomas	CGSB Level:	2	Reg. # :	6	SNT-TC-1A Level:	III
RT Assistant # 1		CEDO #:				SNT-TC-1A Level:	
RT Assistant # 2		CEDO #:				SNT-TC-1A Level:	

SNT-TC-1A No: 6

IMPORTANT: See reverse side of this form for All Can Inspection Services (2011) Inc. LIMITED LIABILITY POLICY

Technician Signature

Date: Aug 1/17

Client Representative Signature

Evaluation Date

The above interpretation is a technical opinion, not a guarantee.
Client signature indicates acceptance of the report and results.
Clock tape marker and start arrow marked on weldment.
It is the customer's responsibility to map welds on drawings.

Film Make / Brand:	AGFA	Film Class / Type:	1-D5
Screens: Lead	Front: 0.010"	Back: 0.010"	One (no.) film per screen
Film Density in H & D:	Min.: 2.0	Max.: 4.0	
Penetrometer (IQI hole type) designation:	N/A	Recommended Max. U.G.:	0.20"
Source Isotope:	IRIDIUM-192 (Gamma)	Wall Viewing:	Single
Effective Focal Spot Size:	0.146 inches	Processing:	Automatic

RADIOGRAPHIC EXAMINATION REPORT

ALL CAN INSPECTION SERVICES (2011) INC.

Report # G2614

9323-37 Avenue, NW, Edmonton, Alberta T6E 5N4
SHOP: 780-462-1072 OFFICE: 780-462-9797 FAX: 780-462-4664
EMAIL: shop@allcaninspection.com www.allcaninspection.com

Client:	Sub Arc Systems	Client Job #	Coupon
Address:	17 Exploration Way, Devon	P.O. #	Toby
Contact: Name:	Toby	Date:	Aug 1/17
Phone:			
Work Location:	All Can Inspection Shop	Work Description:	Mitch Gouligier

CODES
1. ASME B31.3 N/S
2. ASME B31.3 S/C
3. ASME Sec. VIII Div 1 UW51
4. ASME Sec. VIII Div. 1 UW52
5. CSA Z662
6. CSA Z662 (Sour)
7. API 650
8. ASME IX (QW-191.2)

LF - Lack of Fusion; IP - Incomplete Penetration; IC - Internal Concavity; BT - Burn Through; TI - Tungsten Inclusion; IU: Internal Undercut; EU: External Undercut; EP - Excessive Penetration; P - Porosity; S - Slag; HL - High-Low; C - Crack; AB - Arc Burn; HB - Hollow Bead

Severity: 1 = Slight, 2 = Medium, 3 = Severe (Reject)

NDE No:	Size & thickness Plus Code Max. reinforcement	Material	Code (1 - 8)	IQI (See Back)	Technique Number (See Back)	Source Side of Object to Film Distance (Inches)	Source to Object Distance (Inches)	Number of Exposures	Welder ID	Discontinuity	Severity (1 - 3)	Accept (√)	Reject (X)
SAW 2G	5/8" Spot	P1	8	2	RT-2	0.750	25.000	1	M.GO			√	

RT Technician: Gordon Thomas CGSB Level: 2 Reg. # : 6 SNT-TC-1A Level: III SNT-TC-1A No: 6

RT Assistant # 1 CEDO #: SNT-TC-1A Level: SNT-TC-1A No:

RT Assistant # 2 CEDO #: SNT-TC-1A Level: SNT-TC-1A No:

IMPORTANT: See reverse side of this form for All Can Inspection Services (2011) Inc. LIMITED LIABILITY POLICY

Technician Signature — Date: Aug 1/17

Client Representative Signature — Evaluation Date

The above interpretation is a technical opinion, not a guarantee.
Client signature indicates acceptance of the report and results.

Clock tape marker and start arrow marked on weldment.
It is the customer's responsibility to map welds on drawings.

Film Make / Brand:	AGFA	Film Class / Type:	1-D5
Screens: Lead	Front 0.010"	Back 0.010"	One (ea.) film per screen
Film Density in H & D:	Min 2.0	Max. 4.0	
Penetrameter (IQI hole type) designation:	N/A	Recommended Max. U.G.:	0.20"
Source Isotope:	IRIDIUM-192 (Gamma)	Wall Viewing:	Single
Effective Focal Spot Size:	0.146 inches	Processing:	Automatic

RADIOGRAPHIC EXAMINATION REPORT

ALL CAN INSPECTION SERVICES (2011) INC.

Report # G2613

9323-37 Avenue, NW, Edmonton, Alberta T6E 5N4
SHOP: 780-462-1072 OFFICE: 780-462-9797 FAX: 780-462-4664
EMAIL: shop@allcaninspection.com www.allcaninspection.com

Client:	Sub Arc Systems	Client Job #	Coupon
Address:	17 Exploration Way, Devon	P.O. #	Toby
Contact: Name:	Toby	Date:	Aug 1/17
Phone:			
Work Location:	All Can Inspection Shop	Work Description:	Chris Jaques

CODES
1. ASME B31.3 N/S
2. ASME B31.3 S/C
3. ASME Sec. VIII Div 1 UW51
4. ASME Sec. VIII Div. 1 UW52
5. CSA Z662
6. CSA Z662 (Sour)
7. API 650
8. ASME IX (QW-191.2)

LF - Lack of Fusion; IP - Incomplete Penetration; IC - Internal Concavity; BT - Burn Through; TI - Tungsten Inclusion; IU: Internal Undercut; EU: External Undercut; EP - Excessive Penetration; P - Porosity; S - Slag; HL - High-Low; C - Crack; AB - Arc Burn; HB - Hollow Bead

Severity: 1 = Slight, 2 = Medium, 3 = Severe (Reject)

NDE No:	Size & thickness Plus Code Max. reinforcement	Material	Code (1 - 8)	IQI (See Back)	Technique Number (See Back)	Source Side of Object to Film Distance (inches)	Source to Object Distance (inches)	Number of Exposures	Welder ID	Discontinuity	Severity (1 - 3)	Accept (√)	Reject (X)
SAW 2G	5/8" Spot	P1	8	2	RT-2	0.750	25.000	1	CJA			√	

RT Technician: Gordon Thomas CGSB Level: 2 Reg. #: 6 SNT-TC-1A Level: III SNT-TC-1A No: 6

RT Assistant # 1 CEDO #: SNT-TC-1A Level: SNT-TC-1A No:

RT Assistant # 2 CEDO #: SNT-TC-1A Level: SNT-TC-1A No:

IMPORTANT: See reverse side of this form for All Can Inspection Services (2011) Inc. LIMITED LIABILITY POLICY

Technician Signature — Date: Aug 1/17

Client Representative Signature — Evaluation Date

The above interpretation is a technical opinion, not a guarantee.
Client signature indicates acceptance of the report and results.

Clock tape marker and start arrow marked on weldment.
It is the customer's responsibility to map welds on drawings.

Film Make / Brand:	AGFA	Film Class / Type:	1-D5
Screens: Lead	Front: 0.010"	Back: 0.010"	One (no.) film per screen
Film Density in H & D:	Min: 2.0	Max: 4.0	
Penetrameter (IQI hole type) designation:	N/A	Recommended Max. U.C.:	0.20"
Source Isotope:	IRIDIUM-192 (Gamma)	Wall Viewing:	Single
Effective Focal Spot Size:	0.146 inches	Processing:	Automatic

RADIOGRAPHIC EXAMINATION REPORT

ALL CAN INSPECTION SERVICES (2011) INC.

Report # G2575

9323-37 Avenue, NW, Edmonton, Alberta T6E 5N4
SHOP: 780-462-1072 OFFICE: 780-462-9797 FAX: 780-462-4664
EMAIL: shop@allcaninspection.com www.allcaninspection.com

Client:	Sub Arc Systems	Client Job #	Welder Coupons
Address:	17 Exploration Way, Devon	P.O. #	Toby
Contact: Name:	Toby	Date:	July 26/17
Phone:			
Work Location:	All Can Inspection Shop	Work Description:	M.TV

CODES
1. ASME B31.3 N/S
2. ASME B31.3 S/C
3. ASME Sec. VIII Div.1 UW51
4. ASME Sec. VIII Div. 1 UW52
5. CSA Z662
6. CSA Z662 (Sour)
7. API 650
8. ASME IX (QW-191.2)

NDE No:	Size & thickness Plus Code Max. reinforcement	Material	Code	IQI	Technique Number	Source Side of Object to Film Distance	Source to Object Distance	Number of Exposures	Welder ID	Discontinuity	Severity	Accept	Reject
			1 - 8	See Back	See Back	Inches	Inches				1 - 3	√	x
2G SAW SAS 1	5/8" SPOT	P1	8	2	RT-2	0.750	25.000	1	M.TU			√	

LF - Lack of Fusion; EP - Excessive Penetration; IP - Incomplete Penetration; P - Porosity; IC - Internal Concavity; S - Slag; BT - Burn Through; HL - High-Low; TI - Tungsten Inclusion; C - Crack; IU: Internal Undercut; AB - Arc Burn; EU: External Undercut; HB - Hollow Bead

Severity: 1 = Slight, 2 = Medium, 3 = Severe (Reject)

RT Technician:	Gordon Thomas	CGSB Level:	2	Reg. #:	6	SNT-TC-1A Level:	III
RT Assistant # 1	Adele Kezama	CEDO #:	18988			SNT-TC-1A Level:	II
RT Assistant # 2		CEDO #:				SNT-TC-1A Level:	

SNT-TC-1A No:	6		
SNT-TC-1A No:	18988		
SNT-TC-1A No:			

IMPORTANT: See reverse side of this form for All Can Inspection Services (2011) Inc. LIMITED LIABILITY POLICY

Technician Signature — Date: July 26/17

Client Representative Signature — Evaluation Date

The above interpretation is a technical opinion, not a guarantee.
Client signature indicates acceptance of the report and results.

Clock tape marker and start arrow marked on weldment.
It is the customer's responsibility to map welds on drawings.

Film Make / Brand	AGFA	Film Class / Type:	1-D5
Screens: Lead	Front: 0.010"	Back: 0.010"	One (no.) film per screen
Film Density in H & D:	Min. 2.0	Max. 4.0	
Penetrometer (IQI hole type) designation:	N/A	Recommended Max. U.G.	0.20"
Source Isotope:	IRIDIUM-192 (Gamma)	Wall Viewing:	Single
Effective Focal Spot Size:	0.146 inches	Processing:	Automatic

RADIOGRAPHIC EXAMINATION REPORT

ALL CAN INSPECTION SERVICES (2011) INC.

Report # G2574

9323-37 Avenue, NW, Edmonton, Alberta T6E 5N4
SHOP: 780-462-1072 OFFICE: 780-462-9797 FAX: 780-462-4664
EMAIL: shop@allcaninspection.com www.allcaninspection.com

Client: **Sub Arc Systems** Client Job # **Welder Coupons**

Address: 17 Exploration Way, Devon P.O. # **Toby**

Contact: Name: Toby Date: **July 26/17**

Phone:

Work Location: All Can Inspection Shop Work Description: J.OV

CODES
1. ASME B31.3 N/S
2. ASME B31.3 S/C
3. ASME Sec. VIII Div 1 UW51
4. ASME Sec. VIII Div. 1 UW52
5. CSA Z662
6. CSA Z662 (Sour)
7. API 650
8. ASME IX (QW-191.2)

UF - Lack of Fusion; IP - Incomplete Penetration; IC - Internal Concavity; BT - Burn Through; TI - Tungsten Inclusion; IU: Internal Undercut; EU: External Undercut; EP - Excessive Penetration; P - Porosity; S - Slag; HL - High-Low; C - Crack; AB - Arc Burn; HB - Hollow Bead

Severity: 1 = Slight, 2 = Medium, 3 = Severe (Reject)

NDE No:	Size & thickness Plus Code Max. reinforcement	Material	Code	IQI	Technique Number	Source Side of Object to Film Distance	Source to Object Distance	Number of Exposures	Welder ID	Discontinuity	Severity	Accept	Reject
			1 - 8	See Back	See Back	Inches	Inches				1 - 3	√	X
2G SAW SAS 1	5/8" SPOT	P1	8	2	RT-2	0.750	25.000	1	J.OV			√	

RT Technician: Gordon Thomas CGSB Level: 2 Reg. # : 6 SNT-TC-1A Level: III SNT-TC-1A No: 6

RT Assistant # 1 Adele Kezama CEDO #: 18988 SNT-TC-1A Level: II SNT-TC-1A No: 18988

RT Assistant # 2 CEDO #: SNT-TC-1A Level: SNT-TC-1A No:

IMPORTANT: See reverse side of this form for All Can Inspection Services (2011) Inc. LIMITED LIABILITY POLICY

Technician Signature — Date: July 26/17

Client Representative Signature — Evaluation Date

The above interpretation is a technical opinion, not a guarantee.
Client signature indicates acceptance of the report and results.

Clock tape marker and start arrow marked on weldment.
It is the customer's responsibility to map welds on drawings.

Film Make / Brand: AGFA Film Class / Type: 1-DS

Screens: Lead Front: 0.010" Back: 0.010" One (no.) film per screen

Film Density in H & D: Min: 2.0 Max: 4.0

Penetrometer (IQI hole type) designation: N/A Recommended Max. U.G.: 0.20"

Source Isotope: IRIDIUM-192 (Gamma) Wall Viewing: Single

Effective Focal Spot Size: 0.146 inches Processing: Automatic

RADIOGRAPHIC EXAMINATION REPORT

ALL CAN INSPECTION SERVICES (2011) INC.

Report # G2573

9323-37 Avenue, NW, Edmonton, Alberta T6E 5N4
SHOP: 780-462-1072 OFFICE: 780-462-9797 FAX: 780-462-4664
EMAIL: shop@allcaninspection.com www.allcaninspection.com

Client:	Sub Arc Systems	Client Job #	Welder Coupons
Address:	17 Exploration Way, Devon	P.O. #	Toby
Contact: Name:	Toby	Date:	July 26/17
Phone:			
Work Location:	All Can Inspection Shop	Work Description:	J.Ni

CODES
1. ASME B31.3 N/S
2. ASME B31.3 S/C
3. ASME Sec. VIII Div 1 UW51
4. ASME Sec. VIII Div. 1 UW52
5. CSA Z662
6. CSA Z662 (Sour)
7. API 650
8. ASME IX (QW-191.2)

LF - Lack of Fusion; IP - Incomplete Penetration; IC - Internal Concavity; BT - Burn Through; TI - Tungsten Inclusion; IU: Internal Undercut; EU: External Undercut; EP - Excessive Penetration; P - Porosity; S - Slag; HL - High-Low; C - Crack; AB - Arc Burn; HB - Hollow Bead

Severity: 1 = Slight, 2 = Medium, 3 = Severe (Reject)

NDE No:	Size & thickness Plus Code Max. reinforcement	Material	Code 1-8	IQI See Back	Technique Number See Back	Source Side of Object to Film Distance inches	Source to Object Distance inches	Number of Exposures	Welder ID	Discontinuity	Severity 1-3	Accept √	Reject X
2G SMAW-SAS 1	5/8" SPOT	P1	8	2	RT-2	0.750	25.000	1	J.Ni	(P @ 2" & 6"(ok)) S @ 0"-1"	3		X
3G SMAW-SAS 1	5/8" SPOT	P1	8	2	RT-2	0.750	25.000	1	J.Ni			√	
4G SMAW-SAS 1	5/8" SPOT	P1	8	2	RT-2	0.750	25.000	1	J.Ni	P @ 0"	1	√	

RT Technician:	Gordon Thomas	CGSB Level: 2	Reg. #: 6	SNT-TC-1A Level: III	SNT-TC-1A No: 6
RT Assistant # 1	Adele Kezama	CEDO #: 18988		SNT-TC-1A Level: II	SNT-TC-1A No: 18988
RT Assistant # 2		CEDO #:		SNT-TC-1A Level:	SNT-TC-1A No:

IMPORTANT: See reverse side of this form for All Can Inspection Services (2011) Inc. LIMITED LIABILITY POLICY

Technician Signature — Date: July 26/17

Client Representative Signature — Evaluation Date

The above interpretation is a technical opinion, not a guarantee.
Client signature indicates acceptance of the report and results.
Clock tape marker and start arrow marked on weldment.
It is the customer's responsibility to map welds on drawings.

Film Make / Brand:	AGFA	Film Class / Type:	I-D5
Screens: Lead	Front 0.010"	Back 0.010"	One (no.) film per screen
Film Density in H & D:	Min. 2.0	Max. 4.0	
Penetrometer (IQI hole type) designation:	N/A	Recommended Max. U.C.:	0.20"
Source Isotope:	IRIDIUM-192 (Gamma)	Wall Viewing:	Single
Effective Focal Spot Size:	0.146 inches	Processing:	Automatic

RADIOGRAPHIC EXAMINATION REPORT

ALL CAN INSPECTION SERVICES (2011) INC.

Report # G2572

9323-37 Avenue, NW, Edmonton, Alberta T6E 5N4
SHOP: 780-462-1072 OFFICE: 780-462-9797 FAX: 780-462-4664
EMAIL: shop@allcaninspection.com www.allcaninspection.com

Client: **Sub Arc Systems** Client Job # **Welder Coupons**

Address: 17 Exploration Way, Devon P.O. # **Toby**

Contact: Name: Toby Date: **July 26/17**

Phone:

Work Location: All Can Inspection Shop Work Description: K.WR

CODES
1. ASME B31.3 N/S
2. ASME B31.3 S/C
3. ASME Sec. VIII Div 1 UW51
4. ASME Sec. VIII Div. 1 UW52
5. CSA Z662
6. CSA Z662 (Sour)
7. API 650
8. ASME IX (QW-191.2)

LF - Lack of Fusion; IP - Incomplete Penetration; IC - Internal Concavity; BT - Burn Through; TI - Tungsten Inclusion; IU: Internal Undercut; EU: External Undercut; EP - Excessive Penetration; P - Porosity; S - Slag; HL - High-Low; C - Crack; AB - Arc Burn; HB - Hollow Bead

Severity: 1 = Slight, 2 = Medium, 3 = Severe (Reject)

NDE No:	Size & thickness Plus Code Max. reinforcement	Material	Code	IQI	Technique Number	Source Side of Object to Film Distance	Source to Object Distance	Number of Exposures	Welder ID	Discontinuity	Severity	Accept	Reject
			1 - 8	See Back	See Back	Inches	Inches				1 - 3	√	X
2G SMAW-SAS 1	5/8" SPOT	P1	8	2	RT-2	0.750	25.000	1	K.WR			√	
3G SMAW-SAS 1	5/8" SPOT	P1	8	2	RT-2	0.750	25.000	1	K.WR			√	
4G SMAW-SAS 1	5/8" SPOT	P1	8	2	RT-2	0.750	25.000	1	K.WR			√	
2G SAW	5/8" SPOT	P1	8	2	RT-2	0.750	25.000	1	K.WR			√	

RT Technician: Gordon Thomas CGSB Level: 2 Reg. #: 6 SNT-TC-1A Level: III SNT-TC-1A No: 6

RT Assistant # 1 Adele Kezama CEDO #: 18988 SNT-TC-1A Level: II SNT-TC-1A No: 18988

RT Assistant # 2 CEDO #: SNT-TC-1A Level: SNT-TC-1A No:

IMPORTANT: See reverse side of this form for All Can Inspection Services (2011) Inc. LIMITED LIABILITY POLICY

Technician Signature July 26/17 Date

Client Representative Signature Evaluation Date

The above interpretation is a technical opinion, not a guarantee.
Client signature indicates acceptance of the report and results.

Clock tape marker and start arrow marked on weldment.
It is the customer's responsibility to map welds on drawings.

Film Make / Brand: AGFA Film Class / Type: 1-D5

Screens: Lead Front: 0.010" Back: 0.010" One (no.) film per screen

Film Density (D H & D): Min.: 2.0 Max.: 4.0

Penetrometer (IQI hole type) designation: N/A Recommended Max. U.G.: 0.20"

Source Isotope: IRIDIUM-192 (Gamma) Wall Viewing: Single

Effective Focal Spot Size: 0.146 inches Processing: Automatic

RADIOGRAPHIC EXAMINATION REPORT

ALL CAN INSPECTION SERVICES (2011) INC.

Report # G2571

9323-37 Avenue, NW, Edmonton, Alberta T6E 5N4
SHOP: 780-462-1072 OFFICE: 780-462-9797 FAX: 780-462-4664
EMAIL: shop@allcaninspection.com www.allcaninspection.com

Client:	Sub Arc Systems	Client Job #	Welder Coupons
Address:	17 Exploration Way, Devon	P.O. #	Toby
Contact: Name:	Toby	Date:	July 26/17
Phone:			
Work Location:	All Can Inspection Shop	Work Description:	T.MO

CODES
1. ASME B31.3 N/S
2. ASME B31.3 S/C
3. ASME Sec. VIII Div 1 UW51
4. ASME Sec. VIII Div. 1 UW52
5. CSA Z662
6. CSA Z662 (Sour)
7. API 650
8. ASME IX (QW-191.2)

NDE No:	Size & thickness Plus Code Max. reinforcement	Material	Code	IQI	Technique Numbers	Source Side of Object to Film Distance	Source to Object Distance	Number of Exposures	Welder ID	Severity	Accept	Reject
			1 - 8	See Back	See Back	Inches	Inches			1 - 3	√	X
2G SMAW-SAS 1	5/8" SPOT	P1	8	2	RT-2	0.750	25.000	1	T.MO		√	
3G SMAW-SAS 1	5/8" SPOT	P1	8	2	RT-2	0.750	25.000	1	T.MO		√	
4G SMAW-SAS 1	5/8" SPOT	P1	8	2	RT-2	0.750	25.000	1	T.MO		√	

LF - Lack of Fusion; IP - Incomplete Penetration; IC - Internal Concavity; BT - Burn Through; TI - Tungsten Inclusion; IU: Internal Undercut; EU: External Undercut; EP - Excessive Penetration; P - Porosity; S - Slag; HL - High-Low; C - Crack; AB - Arc Burn; HB - Hollow Bead

Severity: 1 = Slight, 2 = Medium, 3 = Severe (Reject)

RT Technician:	Gordon Thomas	CGSB Level:	2	Reg. #:	6	SNT-TC-1A Level:	III
RT Assistant # 1	Adele Kezama	CEDO #:	18988			SNT-TC-1A Level:	II
RT Assistant # 2		CEDO #:				SNT-TC-1A Level:	

SNT-TC-1A No: 6
SNT-TC-1A No: 18988
SNT-TC-1A No:

IMPORTANT: See reverse side of this form for All Can Inspection Services (2011) Inc. LIMITED LIABILITY POLICY

Technician Signature — Date: July 26/17

Client Representative Signature — Evaluation Date

The above interpretation is a technical opinion, not a guarantee.
Client signature indicates acceptance of the report and results.
Clock tape marker and start arrow marked on weldment.
It is the customer's responsibility to map welds on drawings.

Film Make / Brand:	AGFA	Film Class / Type:	I-D5
Screens: Lead	Front: 0.010"	Back: 0.010"	One (no.) film per screen
Film Density in H & D:	Min. 2.0	Max. 4.0	
Penetrometer (IQI hole type) designation:	N/A	Recommended Max. U.G.:	0.20"
Source Isotope:	IRIDIUM-192 (Gamma)	Wall Viewing:	Single
Effective Focal Spot Size:	0.146 inches	Processing:	Automatic

RADIOGRAPHIC EXAMINATION REPORT

ALL CAN INSPECTION SERVICES (2011) INC.

Report # G2570

9323-37 Avenue, NW, Edmonton, Alberta T6E 5N4
SHOP: 780-462-1072 OFFICE: 780-462-9797 FAX: 780-462-4664
EMAIL: shop@allcaninspection.com www.allcaninspection.com

Client: **Sub Arc Systems** Client Job # **Welder Coupons**

Address: 17 Exploration Way, Devon P.O. # **Toby**

Contact: Name: Toby Date: **July 26/17**

Phone:

Work Location: All Can Inspection Shop Work Description: J.Hi

CODES
1. ASME B31.3 N/S
2. ASME B31.3 S/C
3. ASME Sec. VIII Div 1 UW51
4. ASME Sec. VIII Div. 1 UW52
5. CSA Z662
6. CSA Z662 (Sour)
7. API 650
8. ASME IX (QW-191.2)

LF - Lack of Fusion; IP - Incomplete Penetration; IC - Internal Concavity; BT - Burn Through; TI - Tungsten Inclusion; IU: Internal Undercut; EU: External Undercut; EP - Excessive Penetration; P - Porosity; S - Slag; HL - High-Low; C - Crack; AB - Arc Burn; HB - Hollow Bead

Severity: 1 = Slight, 2 = Medium, 3 = Severe (Reject)

NDE No:	Size & thickness Plus Code Max. reinforcement	Material	Code (1 - 8)	IQI (See Back)	Technique Number (See Back)	Source Side of Object to Film Distance (Inches)	Source to Object Distance (Inches)	Number of Exposures	Welder ID	Discontinuity	Severity (1 - 3)	Accept (√)	Reject (x)
2G SMAW-SAS 1	5/8" SPOT	P1	8	2	RT-2	0.750	25.000	1	J.Hi			√	
3G SMAW-SAS 1	5/8" SPOT	P1	8	2	RT-2	0.750	25.000	1	J.Hi			√	
4G SMAW-SAS 1	5/8" SPOT	P1	8	2	RT-2	0.750	25.000	1	J.Hi			√	

RT Technician: Gordon Thomas CGSB Level: 2 Reg. #: 6 SNT-TC-1A Level: III SNT-TC-1A No: 6

RT Assistant # 1 Adele Kezama CEDO #: 18988 SNT-TC-1A Level: II SNT-TC-1A No: 18988

RT Assistant # 2 CEDO #: SNT-TC-1A Level: SNT-TC-1A No:

IMPORTANT: See reverse side of this form for All Can Inspection Services (2011) Inc. LIMITED LIABILITY POLICY

Technician Signature Date: July 26/17

Client Representative Signature Evaluation Date

The above interpretation is a technical opinion, not a guarantee.
Client signature indicates acceptance of the report and results.

Clock tape marker and start arrow marked on weldment.
It is the customer's responsibility to map welds on drawings.

Film Make / Brand: AGFA Film Class / Type: I-D5

Screens: Lead Front: 0.010" Back: 0.010" One (no.) film per screen

Film Density in H & D: Min.: 2.0 Max.: 4.0

Penetrometer (IQI hole type) designation: N/A Recommended Max. U.G.: 0.20"

Source Isotope: IRIDIUM-192 (Gamma) Wall Viewing: Single

Effective Focal Spot Size: 0.146 inches Processing: Automatic

RADIOGRAPHIC EXAMINATION REPORT

4605-47 Street
Vermillion, AB, T9X 1L6
780-608-9589

QUALITY CONTROL MANUAL

Sub-Arc Systems Inc.	**WELDERS' QUALIFICATION RECORD** **API 650**	**Exhibit 8, Rev A**

WELDER NAME	WELDER SYMBOL	DATE QUALIF.	QUALIFICATION PROCEDURE	LIMITATIONS					REMARKS
				PROCESS	ELECTRODE	POSITION	THICKNESS RANGE	DIAMETER RANGE	
MATT MACKENZIE	M.MA	06,21,17	SAS 1	SMAW	F3, F4	2G	1 1/4"		X-RAY G2343
	M.MA	06,21,17	SAS 1	SMAW	F3, F4	3G	1 1/4"		X-RAY G2343
	M.MA.	06,21,17	SAS 1	SMAW	F3, F4	4G	1 1/4"		X-RAY G2343
	M.MA.	08,01,17	SAS 2	SAW	F7A6	2G	1 1/4"		X-RAY G 2615.

QC (PRINT) **SIGN:**	**DATE** (yyyy-MM-dd):
QA (PRINT) ROBERT HOFFMAN **SIGN:**	**DATE** (yyyy-MM-dd): 2017,08,01

4605-47 Street
Vermillion, AB, T9X 1L6
780-608-9589

QUALITY CONTROL MANUAL

Sub-Arc Systems Inc.	**WELDERS' QUALIFICATION RECORD** **API 650**	**Exhibit 8, Rev A**

WELDER NAME	WELDER SYMBOL	DATE QUALIF.	QUALIFICATION PROCEDURE	LIMITATIONS					REMARKS
				PROCESS	ELECTRODE	POSITION	THICKNESS RANGE	DIAMETER RANGE	
MITCH GOULIGER	M.GO	06,21,17	SAS 1	SMAW	F3, F4	2G	1 1/4"		X-RAY G2341
	M.GO	06,21,17	SAS 1	SMAW	F3, F4	3G	1 1/4"		X-RAY G2341
	M.GO	06,21,17	SAS 1	SMAW	F3, F4	4G	1 1/4"		X-RAY G2341
	M.GO	08,01,17	SAS 2	SAW	F7A6	2G	1 1/4"		X-RAY G 2614.

QC (PRINT) **SIGN:**	**DATE** (yyyy-MM-dd):
QA (PRINT) ROBERT HOFFMAN **SIGN:**	**DATE** (yyyy-MM-dd): 2017, 08, 01

Sub-Arc Systems Inc.	WELDERS' QUALIFICATION RECORD API 650	Exhibit 8, Rev A

WELDER NAME	WELDER SYMBOL	DATE QUALIF.	QUALIFICATION PROCEDURE	LIMITATIONS					REMARKS
				PROCESS	ELECTRODE	POSITION	THICKNESS RANGE	DIAMETER RANGE	
CHRIS JAQUES	C.JA	06,21,17	SAS 1	SMAW	F3, F4	2G	1 1/4"		X-RAY G2339
	C.JA.	06,21,17	SAS 1	SMAW	F3, F4	3G	1 1/4"		X-RAY G2339
	C.JA.	06,21,17	SAS 1	SMAW	F3, F4	4G	1 1/4"		X-RAY G2339
	C.JA	08,01,17	SAS2	SAW	F7A6	2G	1 1/4"		X-RAY G2613

QC (PRINT) SIGN:	DATE (yyyy-MM-dd):
QA (PRINT) ROBERT HOFFMAN SIGN:	DATE (yyyy-MM-dd): 2017,08,01

Sub-Arc Systems Inc.	WELDERS' QUALIFICATION RECORD API 650	Exhibit 8, Rev A

WELDER NAME	WELDER SYMBOL	DATE QUALIF.	QUALIFICATION PROCEDURE	LIMITATIONS					REMARKS
				PROCESS	ELECTRODE	POSITION	THICKNESS RANGE	DIAMETER RANGE	
MATT TURMEL	M.TU	06,21,17	SAS 1	SMAW	F3, F4	2G	1 1/4"		X-RAY G2342
	M.TU	06,21,17	SAS 1	SMAW	F3, F4	3G	1 1/4"		X-RAY G2342
	M.TU	06,21,17	SAS 1	SMAW	F3, F4	4G	1 1/4"		X-RAY G2342
	M.TU	07,26,17	SAS 2	SAW	F7A6	2G	1 1/4"		X-RAY G2575

QC (PRINT) SIGN:	DATE (yyyy-MM-dd):
QA (PRINT) ROBERT HOFFMAN SIGN:	DATE (yyyy-MM-dd): 2017,07,26

4605-47 Street
Vermillion, AB, T9X 1L6
780-608-9589

QUALITY CONTROL MANUAL

Sub-Arc Systems Inc.	**WELDERS' QUALIFICATION RECORD** **API 650**	**Exhibit 8, Rev A**

WELDER NAME	WELDER SYMBOL	DATE QUALIF.	QUALIFICATION PROCEDURE	LIMITATIONS					REMARKS
				PROCESS	ELECTRODE	POSITION	THICKNESS RANGE	DIAMETER RANGE	
JOEL OVEREARD	J.OV	06,21,17	SAS 1	SMAW	F3. F4	2G.	1 1/4"		X-Ray G2340
	J.OV	06,21,17	SAS 1	SMAW	F3. F4	3G	1 1/4"		X-Ray G2340
	J.OV	06,21,17	SAS 1	SMAW	F3. F4	4G	1 1/4"		X-Ray G2340
	J.OV	07,26,17	SAS 2	SAW	F7A6	2G	1 1/4"		X-Ray G2574

QC (PRINT) **SIGN:**	**DATE** (yyyy-MM-dd):
QA (PRINT) ROBERT HOFFMAN **SIGN:**	**DATE** (yyyy-MM-dd): 2017, 07, 26.

Sub-Arc Systems Inc.	**WELDERS' QUALIFICATION RECORD** **API 650**	**Exhibit 8, Rev A**

WELDER NAME	WELDER SYMBOL	DATE QUALIF.	QUALIFICATION PROCEDURE	LIMITATIONS					REMARKS
				PROCESS	ELECTRODE	POSITION	THICKNESS RANGE	DIAMETER RANGE	
KEVIN WRIGHT	K.W.R	07,26,17	SAS 1	SMAW	F3. F4	2G.	1 1/4"		X-Ray G2572
	K.W.R	07,26,17	SAS 1	SMAW	F3. F4	3G	1 1/4"		X-Ray G2572
	K.W.R.	07,26,17	SAS 1	SMAW	F3 F4	4G	1 1/4"		X-Ray G 2572
	K.W.R	07,26,17	SAS 2	SAW	F7 A6	2G	1 1/4"		X-Ray G 2572

QC (PRINT) **SIGN:**	**DATE** (yyyy-MM-dd):
QA (PRINT) ROBERT HOFFMAN **SIGN:**	**DATE** (yyyy-MM-dd): 2017, 07, 28

Sub-Arc Systems Inc.	**WELDERS' QUALIFICATION RECORD** **API 650**	**Exhibit 8, Rev A**

WELDER NAME	WELDER SYMBOL	DATE QUALIF.	QUALIFICATION PROCEDURE	LIMITATIONS					REMARKS
				PROCESS	ELECTRODE	POSITION	THICKNESS RANGE	DIAMETER RANGE	
JOEL OVERGAARD	J.OV	07,26,17	SAS 2	SAW	F7A6	2G	1 1/4"		X Ray * G2574

QC (PRINT) **SIGN:**	**DATE** (yyyy-MM-dd):
QA (PRINT) ROBERT HOFFMAN **SIGN:**	**DATE** (yyyy-MM-dd): 2017, 07, 28

4605-47 Street
Vermillion, AB, T9X 1L6
780-608-9589

QUALITY CONTROL MANUAL

Sub-Arc Systems Inc.	**WELDERS' QUALIFICATION RECORD** **API 650**	**Exhibit 8, Rev A**

WELDER NAME	WELDER SYMBOL	DATE QUALIF.	QUALIFICATION PROCEDURE	LIMITATIONS					REMARKS
				PROCESS	ELECTRODE	POSITION	THICKNESS RANGE	DIAMETER RANGE	
JOE NIEDERHOFF	J.NI	07,26,17	SAS 1	SMAW	F3, F4	3G	1 1/4"		X RAY # G2573
	J.NI	07,26,17	SAS 1	SMAW	F3, F4	4G	1 1/4"		X RAY # G2573
	J.NI	08,01,17	SAS 1	SMAW	F3, F4	2G	1 1/4"		X RAY G 2616.

QC (PRINT) **SIGN:**	**DATE** (yyyy-MM-dd):
QA (PRINT) ROBERT HOFFMAN **SIGN:**	**DATE** (yyyy-MM-dd): 2017, 08, 01

Sub-Arc Systems Inc.	**WELDERS' QUALIFICATION RECORD** **API 650**	**Exhibit 8, Rev A**

WELDER NAME	WELDER SYMBOL	DATE QUALIF.	QUALIFICATION PROCEDURE	LIMITATIONS					REMARKS
				PROCESS	ELECTRODE	POSITION	THICKNESS RANGE	DIAMETER RANGE	
JUSTIN HILL	J. HI	07,26,17	SAS 1	SMAW	F3, F4	2G	1 1/4"		X-RAY G2570
	J. HI	07,26,17	SAS 1	SMAW	F3, F4	3G	1 1/4"		X-RAY G2570
	J. HI	07,26,17	SAS 1	SMAW	F3 F4	4G	1 1/4"		X-RAY G2570

QC (PRINT) **SIGN:**	**DATE** (yyyy-MM-dd):
QA (PRINT) ROBERT HOFFMAN **SIGN:**	**DATE** (yyyy-MM-dd): 2017, 07, 28

4605-47 Street
Vermillion, AB, T9X 1L6
780-608-9589

QUALITY CONTROL MANUAL

Sub-Arc Systems Inc.	**WELDERS' QUALIFICATION RECORD** **API 650**	**Exhibit 8, Rev A**

WELDER NAME	WELDER SYMBOL	DATE QUALIF.	QUALIFICATION PROCEDURE	LIMITATIONS					REMARKS
				PROCESS	ELECTRODE	POSITION	THICKNESS RANGE	DIAMETER RANGE	
JOE NIEDERHOFF	J.NI	07,26,17	SAS 1	SMAW	F3, F4	3G	1 1/4"		XRAY #E2573
	J.NI	07,26,17	SAS 1	SMAW	F3, F4	4G	1 1/4"		XRAY #E2573

QC (PRINT) **SIGN:**	**DATE** (yyyy-MM-dd):
QA (PRINT) ROBERT HOFFMAN **SIGN:** Robert Hoffman	**DATE** (yyyy-MM-dd): 2017, 07, 28

Sub-Arc Systems Inc.	**WELDERS' QUALIFICATION RECORD** **API 650**	**Exhibit 8, Rev A**

WELDER NAME	WELDER SYMBOL	DATE QUALIF.	QUALIFICATION PROCEDURE	LIMITATIONS					REMARKS
				PROCESS	ELECTRODE	POSITION	THICKNESS RANGE	DIAMETER RANGE	
MATT TURMEL	M.TU.	07,26,17		SAW	F7A6	2F	1¼"		XRAY # G2575

QC (PRINT) **SIGN:**	**DATE** (yyyy-MM-dd):
QA (PRINT) ROBERT HOFFMAN **SIGN:**	**DATE** (yyyy-MM-dd): 2017, 07, 28

4605-47 Street
Vermillion, AB, T9X 1L6
780-608-9589

QUALITY CONTROL MANUAL

Sub-Arc Systems Inc.	**WELDERS' QUALIFICATION RECORD** **API 650**	**Exhibit 8, Rev A**

WELDER NAME	WELDER SYMBOL	DATE QUALIF.	QUALIFICATION PROCEDURE	LIMITATIONS					REMARKS
				PROCESS	ELECTRODE	POSITION	THICKNESS RANGE	DIAMETER RANGE	
JOEL OVERGAARD	J.OV	07,26,17		SAW	F7A6	2G	1 1/4"		X RAY # G2574

QC (PRINT) **SIGN:**	**DATE** (yyyy-MM-dd):
QA (PRINT) ROBERT HOFFMAN **SIGN:**	**DATE** (yyyy-MM-dd): 2017, 07, 28

4605-47 Street
Vermillion, AB, T9X 1L6
780-608-9589

QUALITY CONTROL MANUAL

Sub-Arc Systems Inc.	**WELDERS' QUALIFICATION RECORD** **API 650**	**Exhibit 8, Rev A**

WELDER NAME	WELDER SYMBOL	DATE QUALIF.	QUALIFICATION PROCEDURE	LIMITATIONS					REMARKS
				PROCESS	ELECTRODE	POSITION	THICKNESS RANGE	DIAMETER RANGE	
KEVIN WRIGHT	K.W.R	07,26,17	SAS 1	SMAW	F3, F4	2G	1 1/4"		X-Ray G2572
	K.W.R	07,26,17	SAS 1	SMAW	F3, F4	3G	1 1/4"		X-Ray G2572
	K.W.R.	07,26,17	SAS 1	SMAW	F3 F4	4G	1 1/4"		X-Ray G2572
	K.W.R	07,26,17		SAW	F7 A6	2G	1 1/4"		X-Ray G2572

QC (PRINT) **SIGN:**	**DATE** (yyyy-MM-dd):
QA (PRINT) ROBERT HOFFMAN **SIGN:**	**DATE** (yyyy-MM-dd): 2017, 07, 28

Sub-Arc Systems Inc.	WELDERS' QUALIFICATION RECORD API 650	Exhibit 8, Rev A

WELDER NAME	WELDER SYMBOL	DATE QUALIF.	QUALIFICATION PROCEDURE	LIMITATIONS					REMARKS
				PROCESS	ELECTRODE	POSITION	THICKNESS RANGE	DIAMETER RANGE	
TYLER MONCRIEF	T. MO	07.26.17	SAS 1	SMAW	F3, F4	2G	1 1/4"		XRAY # G2571
	T. MO	07.26.17	SAS 1	SMAW	F3, F4	3G	1 1/4"		XRAY # G2571
	T. MO	07.26.17	SAS 1	SMAW	F3 F4	4G	1 1/4"		XRAY # G2571.

QC (PRINT) SIGN:	DATE (yyyy-MM-dd):
QA (PRINT) ROBERT HOFFMAN SIGN: [signature]	DATE (yyyy-MM-dd): 2017, 07, 28

4605-47 Street
Vermillion, AB, T9X 1L6
780-608-9589

QUALITY CONTROL MANUAL

Sub-Arc Systems Inc.	**WELDERS' QUALIFICATION RECORD** **API 650**	**Exhibit 8, Rev A**

WELDER NAME	WELDER SYMBOL	DATE QUALIF.	QUALIFICATION PROCEDURE	LIMITATIONS					REMARKS
				PROCESS	ELECTRODE	POSITION	THICKNESS RANGE	DIAMETER RANGE	
CHRIS JAQUES	C.JA	06,21,17	SAS 1	SMAW	F3, F4	2G	1 1/4"		X-RAY G2339
	C.JA.	06,21,17	SAS 1	SMAW	F3, F4	3G	1 1/4"		X-RAY G2339
	C.JA.	06,21,17	SAS 1	SMAW	F3, F4	4G	1 1/4"		X-RAY G2339

QC (PRINT) **SIGN:**	**DATE** (yyyy-MM-dd):
QA (PRINT) ROBERT HOFFMAN **SIGN:**	**DATE** (yyyy-MM-dd): 2017, 06, 23

4605-47 Street
Vermillion, AB, T9X 1L6
780-608-9589

QUALITY CONTROL MANUAL

Sub-Arc Systems Inc.	**WELDERS' QUALIFICATION RECORD** **API 650**	**Exhibit 8, Rev A**

WELDER NAME	WELDER SYMBOL	DATE QUALIF.	QUALIFICATION PROCEDURE	LIMITATIONS					REMARKS
				PROCESS	ELECTRODE	POSITION	THICKNESS RANGE	DIAMETER RANGE	
JOEL OVEREARD	J.OV	06,21,17	SAS 1	SMAW	F3, F4	2G	1 1/4"		X-RAY G2340
	J.OV	06,21,17	SAS 1	SMAW	F3, F4	3G	1 1/4"		X-RAY G2340
	J.OV	06,21,17	SAS 1	SMAW	F3, F4	4G	1 1/4"		X-RAY G2340

QC (PRINT) **SIGN:**	**DATE** (yyyy-MM-dd):
QA (PRINT) ROBERT HOFFMAN **SIGN:**	**DATE** (yyyy-MM-dd): 2017, 06, 23.

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780-608-9589

QUALITY CONTROL MANUAL

Sub-Arc Systems Inc.	**WELDERS' QUALIFICATION RECORD** **API 650**	**Exhibit 8, Rev A**

WELDER NAME	WELDER SYMBOL	DATE QUALIF.	QUALIFICATION PROCEDURE	LIMITATIONS					REMARKS
				PROCESS	ELECTRODE	POSITION	THICKNESS RANGE	DIAMETER RANGE	
MITCH GOULIGER	M.GO	06,21,17	SAS 1	SMAW	F3, F4	2G	1 1/4"		X-RAY G2341
	M.GO	06,21,17	SAS 1	SMAW	F3, F4	3G	1 1/4"		X-RAY G2341
	M.GO	06,21,17	SAS 1	SMAW	F3, F4	4G	1 1/4"		X-RAY G2341

QC (PRINT) **SIGN:**	**DATE** (yyyy-MM-dd):
QA (PRINT) ROBERT HOFFMAN **SIGN:**	**DATE** (yyyy-MM-dd): 2017, 06, 23.

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780-608-9589

QUALITY CONTROL MANUAL

Sub-Arc Systems Inc.	**WELDERS' QUALIFICATION RECORD** **API 650**	**Exhibit 8, Rev A**

WELDER NAME	WELDER SYMBOL	DATE QUALIF.	QUALIFICATION PROCEDURE	LIMITATIONS					REMARKS
				PROCESS	ELECTRODE	POSITION	THICKNESS RANGE	DIAMETER RANGE	
MATT TURMEL	M.TU	06,21,17	SAS 1	SMAW	F3, F4	2G	1 1/4"		X-RAY G2342
	M.TU	06,21,17	SAS 1	SMAW	F3, F4	3G	1 1/4"		X-RAY G2342
	M.TU	06,21,17	SAS 1	SMAW	F3, F4	4G	1 1/4"		X-RAY G2342

QC (PRINT) **SIGN:**	**DATE** (yyyy-MM-dd):
QA (PRINT) ROBERT HOFFMAN **SIGN:**	**DATE** (yyyy-MM-dd): 2017, 06, 23

Sub-Arc Systems Inc.	**WELDERS' QUALIFICATION RECORD** **API 650**	**Exhibit 8, Rev A**

WELDER NAME	WELDER SYMBOL	DATE QUALIF.	QUALIFICATION PROCEDURE	LIMITATIONS					REMARKS
				PROCESS	ELECTRODE	POSITION	THICKNESS RANGE	DIAMETER RANGE	
MATT MACKENZIE	M.MA	06,21,17	SAS 1	SMAW	F3. F4	2G.	1 1/4"		X-RAY G2343
	M.MA	06,21,17	SAS 1	SMAW	F3. F4	3G	1 1/4"		X-RAY G2343
	M.MA.	06.21.17	SAS 1	SMAW	F3, F4	4G	1 1/4"		X-RAY G2343

QC (PRINT) **SIGN:**	**DATE** (yyyy-MM-dd):
QA (PRINT) ROBERT HOFFMAN **SIGN:**	**DATE** (yyyy-MM-dd): 2017, 06, 23

4605-47 Street
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780-608-9589

QUALITY CONTROL MANUAL

Sub-Arc Systems Inc.	**WELDERS' QUALIFICATION RECORD** **API 650**	**Exhibit 8, Rev A**

WELDER NAME	WELDER SYMBOL	DATE QUALIF.	QUALIFICATION PROCEDURE	LIMITATIONS					REMARKS
				PROCESS	ELECTRODE	POSITION	THICKNESS RANGE	DIAMETER RANGE	
QUITON POTTS	Q.PO	06,21,17	SAS 1	SMAW	F3, F4	2G	1 1/4"		X-Ray E2344
	Q.PO	06,21,17	SAS 1	SMAW	F3, F4	3G	1 1/4"		X-Ray E2344
	Q.PO	06,21,17	SAS 1	SMAW	F3, F4	4G	1 1/4"		X-Ray E2344

QC (PRINT) **SIGN:**	**DATE** (yyyy-MM-dd):
QA (PRINT) ROBERT HOFFMAN **SIGN:**	**DATE** (yyyy-MM-dd): 2017, 06, 23

4605-47 Street
Vermillion, AB, T9X 1L6
780-608-9589

QUALITY CONTROL MANUAL

Sub-Arc Systems Inc.	**WELDERS' QUALIFICATION RECORD** **API 650**	**Exhibit 8, Rev A**

WELDER NAME	WELDER SYMBOL	DATE QUALIF.	QUALIFICATION PROCEDURE	LIMITATIONS					REMARKS
				PROCESS	ELECTRODE	POSITION	THICKNESS RANGE	DIAMETER RANGE	
Dustin ZuBACH	D.ZU	06.21.17	SAS 1	SMAW	F3. F4	2G.	1 1/4"		X-Ray G2345
	D.ZU	06.21.17	SAS 1	SMAW	F3. F4	3G	1 1/4"		X-Ray G2345
	D.ZU	06.21.17	SAS 1	SMAW	F3, F4	4G	1 1/4"		X-Ray G2345

QC (PRINT) **SIGN:**	**DATE** (yyyy-MM-dd):
QA (PRINT) ROBERT HOFFMAN **SIGN:**	**DATE** (yyyy-MM-dd): 2017, 06, 23.

Item 4 – Inspector Qualification

Contents

CWB Inspector Certification - Pierre Dostie

Inspecteur en Soudage Certifié

PIERRE DOSTIE **No. Enr# 3414**

est un Inspecteur en soudage certifié de **Niveau3** et satisfait aux exigences de la norme CSA W178.2 « Qualification des inspecteurs en soudage ».

Valide jusqu'au **février 16, 2018**

Cette certification est valide pour le(s) code(s) et/ou la norme(s) suivant(es) :

CSA W47.1/W59	**Valide jusqu'en août 2020**
ASME MII-1 IX	**Valide jusqu'en novembre 2021**
ASME B31.3	**Valide jusqu'en août 2020**
CSA W47.2/W59.2	**Valide jusqu'en novembre 2021**

Conditions

1. La possession de cette carte ne signifie nullement que son détenteur représente un organisme d'inspection certifiée en vertu de la norme CSA W178.1 et ayant du personnel et des procédures approuvées par le Bureau canadien de soudage.
2. Cette carte demeure la propriété du Bureau et peut être rappelée en tout temps.
3. L'usage de la présente carte à des fins frauduleuses peut entraîner son annulation.

Pour toute question concernant cette qualification, veuillez communiquer avec :

1-800-844-6790 | www.cwbgroup.org

CWB Inspector Certification - Sylvain Germain

Inspecteur en Soudage Certifié

SYLVAIN GERMAIN **No. Enr# 4935**

est un Inspecteur en soudage certifié de **Niveau3** et satisfait aux exigences de la norme CSA W178.2 « Qualification des inspecteurs en soudage ».

Valide jusqu'au **avril 30, 2020**

Cette certification est valide pour le(s) code(s) et/ou la norme(s) suivant(es) :

CSA W47.1-09/W59-13

Expiration de recertification après 6 ans **avril 30, 2020**

Conditions

1. La possession de cette carte ne signifie nullement que son détenteur représente un organisme d'inspection certifié en vertu de la norme CSA W178.1 et ayant du personnel et des procédures approuvées par le Bureau canadien de soudage.
2. Cette carte demeure la propriété du Bureau et peut être rappelée en tout temps.
3. L'usage de la présente carte à des fins frauduleuses peut entraîner son annulation.

Pour toute question concernant cette qualification, veuillez communiquer avec :

1-800-844-6790 | www.cwbgroup.org

Item 5 – Weld Procedures

Contents

SUB-ARC SYSTEMS INC.

Welding Procedure Specification

in accordance with

ASME Section IX

Welding Procedure Specification No.: **SAS-1 Revision 1[1]**

Supporting PQR No. (s): **SAS-1-1, SAS-1-2, SAS-1-3 Revision 1, SAS-1-4**

Qualified for

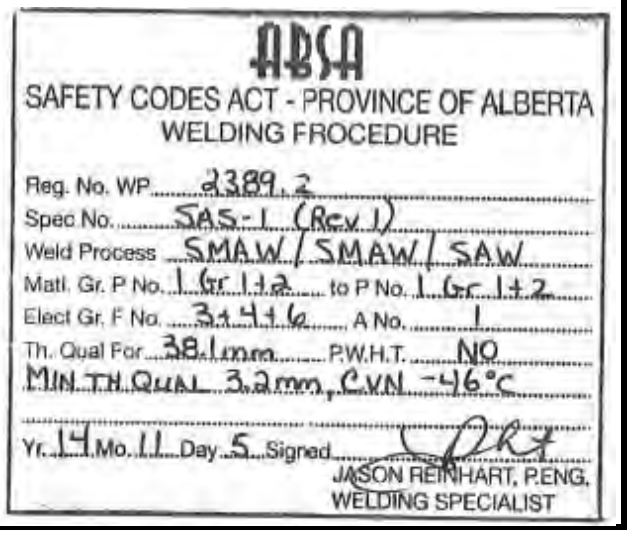
Process(es):	SMAW / SMAW / SAW	**Position(s):**	All / All / Flat or Horizontal[2]
Filler Metal F-No.:	F-3 / F-4 / F-6	**A-No.:**	A-1 / A-1 / A-1
AWS Classification:	E6010 / E7018-1 / F7A6-EM12K	**Weld Type(s):**	Groove, Fillet, Weld buildup
Base Metal:	P-1 Group 1 or 2	To:	P-1 Group 1 or 2
Typical Materials:	This procedure is qualified for all P-1 materials as specified in Table QW-422 of ASME Section IX for applications where proven notch toughness properties are not required, and P-1 Group 1 or 2 materials only for applications where proven notch toughness properties are required.		
Diameter Range:	All diameters	**Condition(s):**	As welded

Thickness Range:	**Normal Service**	**Impact Tested to -50°F**
ASME Section IX	0.062” to 1.500”	0.125” to 1.500”
ASME Section VIII	0.062” to 1.500”	0.125” to 1.500”
ASME B31.1	0.062” to 0.750”	0.125” to 0.750”
ASME B31.3	0.062” to 0.750”	0.125” to 0.750”

[1]Revision 1: Revision to accommodate revision of PQR SAS-1-3 as well as the addition PQR SAS-1-4 to expand the base metal thickness range where proven notch toughness properties are required at -50°F.

[2]SAW position limited by process usability.

Provincial Registration


ABSA
SAFETY CODES ACT - PROVINCE OF ALBERTA
WELDING PROCEDURE
Reg. No. WP 2389.2
Spec No. SAS-1 (Rev 1)
Weld Process SMAW / SMAW / SAW
Matl. Gr. P No. 1 Gr 1+2 to P No. 1 Gr 1+2
Elect Gr. F No. 3+4+6 A No. 1
Th. Qual For 38.1mm P.W.H.T. NO
MIN TH QUAL 3.2mm, CVN -46°C
Yr. 14 Mo. 11 Day 5 Signed
JASON REINHART, P.ENG.
WELDING SPECIALIST

Provincial Registration

WELDING PROCEDURE SPECIFICATION (WPS) QW-482

(Section IX, ASME Boiler and Pressure Vessel Code)

Company Name:	Sub-Arc Systems Inc.	**By:**	Gary Kohlman
WPS No.:	SAS-1	**Date:**	January 4, 2002
Revision No.:	1[1]	**Revision Date:**	July 15, 2014
Supporting PQR's:	SAS-1-1, SAS-1-2, SAS-1-3 Revision 1, SAS-1-4		
Welding Process(es):	SMAW / SMAW / SAW	**Type(s):**	Manual / Manual / Machine

JOINTS QW-402		**Joint Details**
Joint Design:	Butt, Tee, Lap, Corner, etc.	**All ASME joint designs.** Reference construction
Backing:	F-3 SMAW with or without backing.	drawings for joint details. Where joint details are not
	F-4 SMAW with backing only.	specified, refer to typical joint detail sheet provided.
	SAW with backing only.	-----
Backing Material (Type):	Similar base or weld metal or backwelding as required. No Retainers.	

BASE METALS QW-403

P-No.:	P-1	**Group No.:**	*1 or 2	**to P-No.:** P-1 **Group No.:** *1 or 2
OR				
Spec. type & grade:	Not Applicable			**to Spec. type & grade:** Not Applicable
OR				
Chem. Analysis & Mech. Prop.:	Not Applicable			**to Chem. Analysis & Mech. Prop.:** Not Applicable

Thickness Range

		Normal Service	Impact Tested to -50°F		
Base Metal: Groove:	Section IX	0.062" to 1.500"	0.125" to 1.500"	**Fillet:**	All
	Section VIII	0.062" to 1.500"	0.125" to 1.500"	**Fillet:**	All
	B31.1	0.062" to 0.750"	0.125" to 0.750"	**Fillet:**	All
	B31.3	0.062" to 0.750"	0.125" to 0.750"	**Fillet:**	All
Pipe Dia Range: Groove:	All diameters			**Fillet:**	All

Other: Maximum thickness of any weld layer shall not exceed 0.500"

*Limited to P-1 Group 1 or 2 only when proven notch toughness properties are required.

FILLER METALS QW-404

Process:	**SMAW**	**SMAW**	**SAW**
Specification No. (SFA):	5.1	5.1	5.17
AWS Classification No.:	E6010	E7018-1	EM12K
F-No.:	F-3	F-4	F-6
A-No.:	A-1	A-1	A-1
Size of Filler Metals:	3/32", 1/8", 5/32"	3/32", 1/8", 5/32, 3/16", 1/4"	3/32", 1/8", 5/32", 3/16"
Weld Metal Thickness - Groove:	0.250" max.	1.500" max.	1.500" max.
- Fillet:	Unlimited	Unlimited	Unlimited
Electrode-Flux (Class):	Not Applicable	Not Applicable	F7A6-EM12K-H8
Manufacturer:	Not Applicable	Not Applicable	Lincoln Electric
Tradename:	Not Applicable	Not Applicable	LA-61
Flux Trade Name:	Not Applicable	Not Applicable	Lincoln 882 Flux
Alloy Flux:	Not Applicable	Not Applicable	Neutral
Consumable Insert:	Not Applicable	Not Applicable	Not Applicable
Supplemental Filler Metals:	Not Applicable	Not Applicable	Not Applicable
Product Form:	Covered Electrode	Covered Electrode	Coiled Solid Wire
Other:	E6010 limited to root pass only when proven notch toughness properties are required.		

[1]Revision 1: Revision to accommodate revision of PQR SAS-1-3 as well as the addition PQR SAS-1-4 to expand the base metal thickness range where proven notch toughness properties are required at -50°F.

WELDING PROCEDURE SPECIFICATION (WPS) QW-482

(Section IX, ASME Boiler and Pressure Vessel Code)

WPS # SAS-1 Rev.1

POSITIONS QW-405		POSTWELD HEAT TREATMENT QW-407	
Position(s) of Groove:	All	**Temp. Range:**	
Welding Progression:	F-3 SMAW Vertical Up or Down	**Time Range:**	
	F-4 SMAW Vertical Up or Down	**Heating:**	***(None – As Welded)***
	F-6 SAW Flat or Horizontal[1]		
Position(s) of Fillet:	All	**Cooling:**	
PREHEAT QW-406		**GAS QW-408**	
Temperature Min.:		**Shielding Gas(es):**	
Interpass Temp. Max.:	(***See Next Page***)	**Composition:**	
Interpass Min.:		**Flow Rate:**	***(Not Applicable)***
Preheat Maintenance:	Monitor using tempilstiks, pyrometer or	**Gas Backing:**	
	other suitable methods.	**Other:**	

ELECTRICAL CHARACTERISTICS QW-409

Current:	**F-3 SMAW:**	Direct - DC	**F-4 SMAW:**	Direct - DC	**F-6 SAW:**	Direct - DC
Polarity:	**F-3 SMAW:**	Reverse - EP	**F-4 SMAW:**	Reverse - EP	**F-6 SAW:**	Reverse - EP
Amps (Range):	**F-3 SMAW:**	50 - 180	**F-4 SMAW:**	50 - 360	**F-6 SAW:**	250 - 750
Volts (Range):	**F-3 SMAW:**	18 - 34	**F-4 SMAW:**	18 - 34	**F-6 SAW:**	22 - 38
Travel Speed (Range):	**F-3 SMAW:**	1 - 16	**F-4 SMAW:**	1 - 20	**F-6 SAW:**	4 - 35
Maximum Heat Input: 0.125" to 0.625":	**F-3 SMAW:**	25 200 J/in	**F-4 SMAW:**	29 640 J/in	**F-6 SAW:**	36 428 J/in
0.625" to 1.500":	**F-3 SMAW:**	69 300 J/in	**F-4 SMAW:**	63 000 J/in	**F-6 SAW:**	73 636 J/in
Electrode Wire feed speed range:	50 - 550 ipm					
Tungsten Electrode Size & Type:	Not Applicable					
Mode of Metal Transfer for GMAW:	Not Applicable					
Other:	Maximum heat input mandatory only when proven notch toughness is required.					

TECHNIQUE QW-410

String or Weave Bead:	String and weave. Weave size shall be controlled to prevent exceeding maximum heat inputs.
Orifice or Gas Cup Size:	Not Applicable
Initial Cleaning:	Base material must be thoroughly cleaned of all foreign material (scale, rust, oil, grease, paint, tar, etc.) at least 1" back on each side of the joint prior to welding. All surfaces to be welded shall be smooth, uniform and free from notches, slag, fins and burrs.
Interpass Cleaning:	Perform by wire brush, chipping hammer, power brushing, grinding, etc. after each weld layer.
Method of Back Gouging:	Arc air, gouge, grind, etc., grind to clean metal where thermal processes are used if required.
Oscillation:	Not Applicable
Contact Tube to Work Distance:	1/4" to 1 1/4"
Multiple or Single Pass (per side):	Single or multiple passes per side, multiple only when proven notch toughness properties are required.
Multiple or Single Electrodes & Spacing:	Single or Multiple, multiple only when proven notch toughness properties are required.
Peening:	Peening is not allowed

TYPICAL WELDING PARAMETERS

	Filler Metal		Current			
Process	**AWS Classification**	**Diameter (in)**	**Type & Polarity**	**Amp. Range**	**Volt Range**	**Travel Speed (IPM)**
SMAW	E6010	3/32	DC EP	50 - 100	18 - 30	1 - 12
SMAW	E6010	1/8	DC EP	50 - 150	20 - 32	2 - 14
SMAW	E6010	5/32	DC EP	60 - 180	22 - 34	4 - 16
SMAW	E7018-1	3/32	DC EP	50 - 130	18 - 28	1 - 14
SMAW	E7018-1	1/8	DC EP	70 - 180	19 - 30	2 - 16
SMAW	E7018-1	5/32	DC EP	90 - 230	20 - 32	3 - 18
SMAW	E7018-1	3/16	DC-EP	130 - 290	20 - 34	4 - 19
SMAW	E7018-1	1/4	DC-EP	180 - 360	22 - 34	4 - 20
SAW	F7A6-EM12K	3/32	DC EP	250 - 750	22 - 38	4 - 35
SAW	F7A6-EM12K	1/8				
SAW	F7A6-EM12K	5/32				
SAW	F7A6-EM12K	3/16				

Notes: Number of weld layers and size of filler metal may vary with thickness of base material and position of weld.

[1]SAW position limited by process usability.

WELDING PROCEDURE SPECIFICATION (WPS) QW-482

(Section IX, ASME Boiler and Pressure Vessel Code)

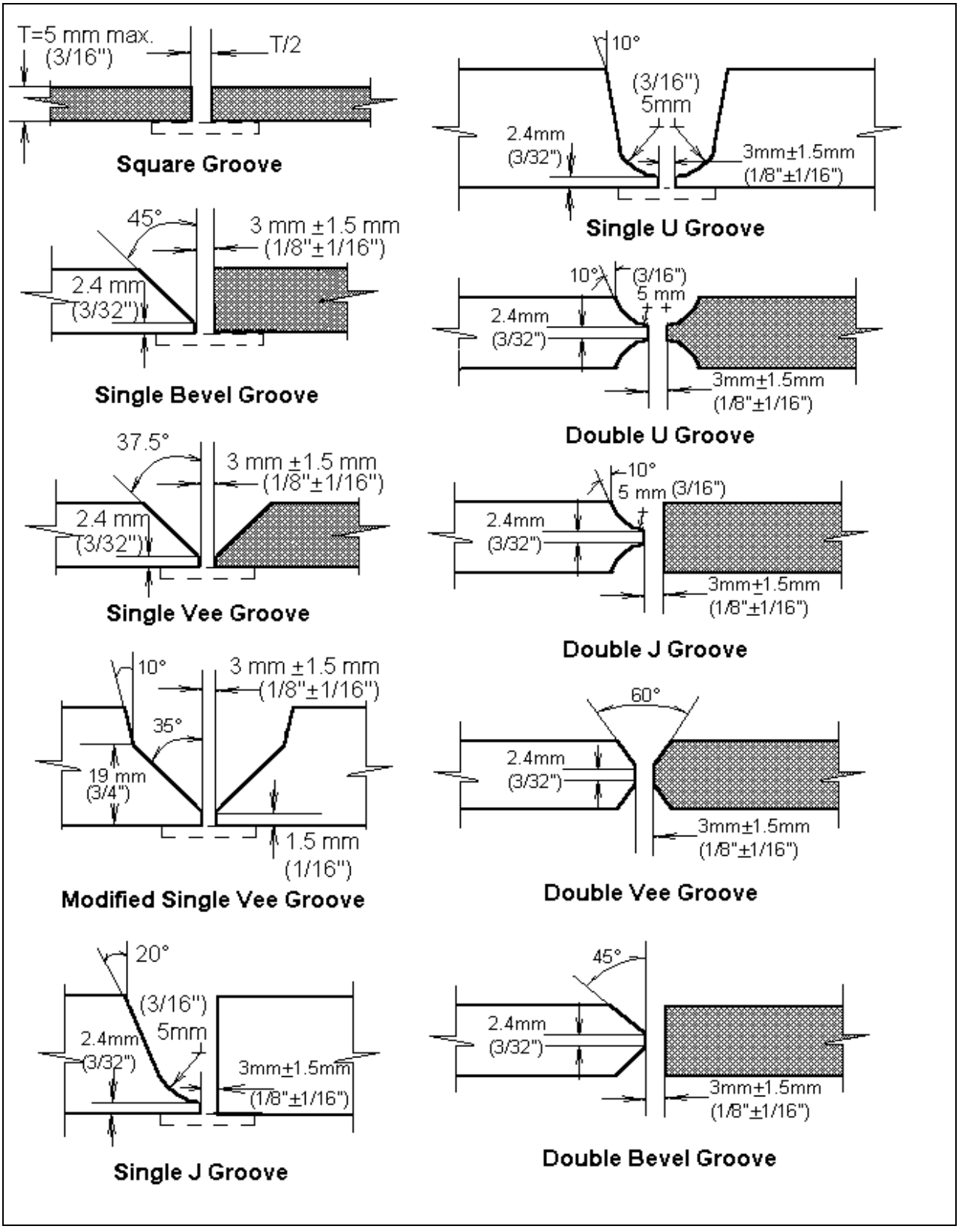
WPS # SAS-1 Rev.1

PREHEAT & INTERPASS TEMPERATURE MINIMUM AND MAXIMUM	
Section VIII :	50°F minimum for all P-1 materials except as listed below :
	175°F if the joint thickness exceeds 1.000” and the specified carbon content exceeds 0.30%
	200°F if the joint thickness is 1.250” to 1.500”
B31.1 :	50°F minimum for all P-1 materials
B31.3 :	50°F for all P-1 materials except as listed below:
	175°F if the specified minimum tensile strength of the base material exceeds 71 ksi
Max. Interpass Temp.:	650°F for normal service, 550°F for applications where proven notch toughness is required

Reference to relevant construction codes is mandatory prior to production welding to determine any supplementary restrictions.

Typical Joint Details QW-482

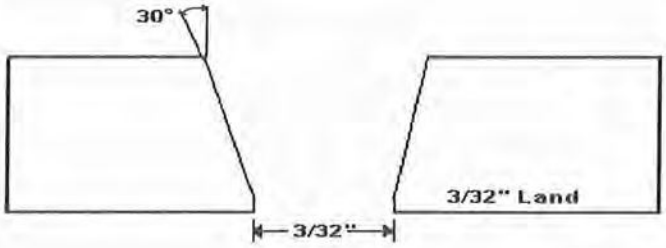
Prepared by: Qualimet

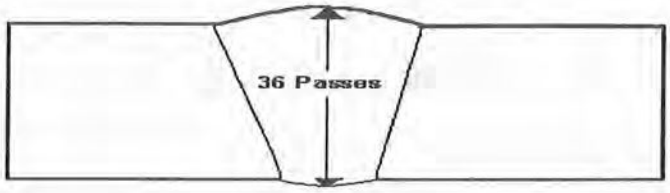


PROCEDURE QUALIFICATION RECORD (PQR) QW-483
(Section IX, ASME Boiler and Pressure Vessel Code)

Company Name:	Sub Arc Systems		
PQR No:	SAS-1-1	**Date:**	January 4, 2002
Revision No.:	-----	**Revision Date:**	-----
WPS No:	SAS-1		
Welding Process(es):	SMAW/ SMAW/ SAW		
Types:	Manual/ Manual/ Machine		

JOINTS QW-402





BASE METALS QW-403

Material Spec.:	SA-516	to	SA-516
Type or Grade:	Grade 60		Grade 70
P-No.:	P-1 Group 1		P-1 Group 2
Thickness of Test Coupon:	1.75" wt.		
Diameter of Test Coupon:	Plate		
Other:	Carbon Equivalent (C.E) : 0.40		

POSTWELD HEAT TREATMENT QW-407

Temperature:	
Time:	
Other:	*Not Applicable*

PREHEAT QW-406

Preheat & Interpass Min.:	175 °F
Interpass Max.:	600°F
	Temperature monitored using Tempilstick

SHIELDING GAS QW-408

Shielding Gas:	N/A
Composition:	N/A
Flow Rate:	N/A

FILLER METALS QW-404

Process	SMAW	SMAW	SAW
SFA Spec No:	5.1	5.1	5.17
AWS Class. No:	E6010	E7018-1	EM12K
F-No:	F-3	F-4	F-6
A-No:	A-1	A-1	A-1
Size of Filler Metal:	1/8"	1/8"	3/32"
Deposited Metal:	0.250"	0.750"	0.750"
Flux Class:	N/A	N/A	F7A6 (Neutral)
Other:	Covered Electrode	Covered Electrode	Coiled Solid Wire
			(Lincoln L61/882)

ELECTRICAL CHARACTERISTICS QW-409

Process:	SMAW	SMAW	SAW
Current:	Direct (DC)	Direct (DC)	Direct (DC)
Polarity:	Reverse (EP)	Reverse (EP)	Reverse (EP)
Volts:	21	21	31
Amps:	110	125	450
Heat Input (J/in):	69 300	63 000	73 636

TECHNIQUE QW-410

Process:	SMAW	SMAW	SAW
Position:	3G	3G	2G
Progression:	Vertical Up	Vertical Up	Horizontal
Travel Speed (ipm):	2.5	2.25	16
String or Weave:	String	String and Weave	String
Oscillation:	N/A	N/A	N/A
Single / Multi Pass:	Multiple	Multiple	Multiple
Single / Multi Electrodes:	Single	Single	Single
Wire Feed Rate:	N/A	N/A	80 ipm

PROCEDURE QUALIFICATION RECORD (PQR) QW-483
(Section IX, ASME Boiler and Pressure Vessel Code)

PQR # SAS-1-1

Tensile Test
QW-462

Specimen No.	Width In	Thickness In	Area in^2	Ultimate Total Load Lb	Ultimate Unit Stress psi	Type of Failure & Location
		See Attached Report				

Guided Bend Tests
QW-462

Type and Figure No.	Result
See Attached Report	

Toughness Tests
QW-170

Specimen No.	Notch Location	Notch Type	Test Temp	Impact Values	Lateral Exp		Drop Weight	
					% Shear	Mils	Break	No Brk
			See Attached Report					

Fillet-Weld Tests
Not Applicable

Result-Satisfactory: Yes ____ No ____ Pen. Into Parent Material: Yes ____ No ____
Macro-Results:

Other Tests

Type of Test: Vickers Hardness Test to NACE MR01
Deposit Analysis: N/A

Welder's Name: Gary Kolman Clock No.: W-2638 Stamp ID: CC
Tests Conducted By: Qualimet Inc. Lab. Test No.: 636 – 01001

We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of Section IX of the ASME Code.

Manufacturer: Sub Arc Systems

Date: January 4, 2002 By: Gary Kolman

• 7817 CORONET ROAD, EDMONTON, AB T6E 4N7 • (780) 468-5670 • FAX (780) 465-5829
• CALGARY (403) 278-9852 • 1-800-621-8979 • www.qualimetinc.com

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MECHANICAL TEST REPORT

for Procedure Qualification Record # SAS-1-1

Client:	Sub Arc Systems	**Job Number:**	636-01001
Address:	4605-47 Steet Vermillion, AB	**Date:**	January 4, 2002
Materials:	SA-516 Grade 60 to 70		
Size:	1.750" wt plate	**Condition:**	As Welded
Test Specification:	ASME Section IX		

Tensile Tests QW - 462.1(a)

Sample Identification:	CCT1	CCT2
Sample Size – inch:(W x T)	1.723 x 0.753	1.717 x 0.759
Least X-Sect. Area - in^2:	1.30	1.30
Ultimate Load - lbs:	102 526	104 116
Ult. Ten. Strength - ksi:	72.3	71.6
Character of Failure:	Ductile	Ductile
Location of Failure:	Base Metal 516 Gr.60 Side	Base Metal 516 Gr.60 Side
Req'd Tensile Strength - ksi:	60.0	60.0
Pass or Fail:	Passed	Passed
Remarks:		

*Bend Test QW - 462.2

Sample Identification:	CCB1	CCB2	CCB3	CCB4
Type of Bend Test:	TSB	TSB	TSB	TSB
Pass or Fail:	Pass	Pass	Pass	Pass
Remarks:				

*Types of Bend Tests

TSB, TFB, TRB = transverse side, face or root bend

LSB, LFB, LRB = longitudinal side, face or root bend

We certify that the statements in this record are acceptable, in accordance with the requirements of ASME Section IX.

TEST RESULTS CERTIFIED BY: QUALIMET INC.

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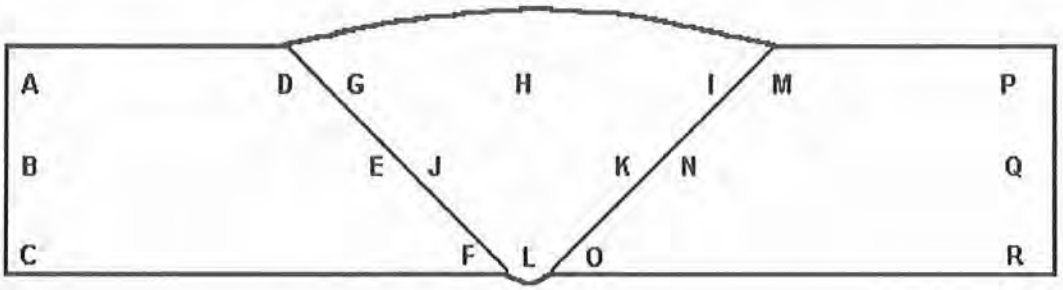
HARDNESS TEST REPORT

for Procedure Qualification Record # SAS-1-1

Client:	Sub Arc Systems	**Job Number:**	636-01001
Address:	4605-47 Steet Vermillion, Alberta T9X-1L6	**Date:**	January 4, 2002
Materials:	SA-516 Grade 60 to 70		
Size:	1.750" wt plate	**Condition:**	As Welded
Test Method:	Hardness testing performed in accordance with ASTM E-92 using a Vickers Hardness Tester with a 10 kg load. (HV10)		
Equipment:	Matsuzawa Seiki Co. Ltd. Vickers Hardness Tester S/N: 7193M		
Calibration:	**Test Block :** 197 ± 6 DPH	**Act. Reading:**	197 DPH



Hardness Values

A	177	D	198	G	205	J	210	M	189	P	178
B	182	E	205	H	103	K	207	N	196	Q	181
C	173	F	201	I	208	L	202	O	194	R	179

These hardness values do not exceed 248 HV10 (HRC 22).

We certify that the statements in this record are acceptable, in accordance with the requirements of ASME Section IX and NACE MR01

Test Results Certified by: QUALIMET INC.