Civil Earthworks Construction Summary – Rankin Inlet Tank Farm

- Construction management and quality assurance performed by Agnico Eagle Construction
- Primary civil construction contractor was MTKSL
- Subcontractors included: Texel Geosol for liner installation and liner QC; Glacier Blasting and Shoring for drill/blast operations
- Crushing operations at Itivia Quarry contracted to Inukshuk Contracting Ltd.
- All survey conducted by Hamel Arpentage
- Explotech conducted pre-and post-inspection surveys of infrastructure surrounding the tank farm and quarry sites. Explotech also installed/monitored four (4) seismographs located in representative areas around the Tank Farm blasting area, with the closest located at the Department of National Defense barracks, in order to perform monitoring of every blast.

1. Site Preparation (April 25 to May 2)

- Multiple discussions held with airport authority, community and Department of National Defense stakeholders prior to project commencement
- Temporary access road to tank farm area constructed of overburden from first blasts and later built up with rock from Itivia Quarry
- Snow cleared from tank farm footprint in advance of drill/blast operations
- OG surveyed of tank farm footprint

2. Drill/Blast (April 27 to June 6)

- All blast patterns designed by MTKSL and reviewed/accepted by Explotech
- Glacier drill/blast contractor – all explosive products supplied by AEM
- Controlled blasting procedures (all blasts were matted) were used for all blasts to control flyrock and limit overpressures (dBL, noise nuisance)
- Between 2 and 3 blasts per day were conducted within the tank farm footprint, for a total of 88 blasts
- Pre-shear blasting was conducted along both the north and west walls to control the rock quality of the high walls
- Additional drilling was required to remove bedrock “tights” within the pedestal and adjacent floor areas of the 20 ML tank (July 3)

3. Excavation (May 1 to June 25)

- Design assumed bedrock depth within the Tank Farm footprint to be approximately 2 m below the ground surface – construction planning and scheduling was therefore based on having an essentially balanced cut/fill operation, with the blasted bedrock to be used to produce the granular fill materials, in addition to providing a sufficient source of feed for creation of the laydown area
- However, as discussed in RFI’s 05, 06 and 08, bedrock was significantly deeper than anticipated over most of the containment area
- The actual quantities of overburden removed from the footprint area were more than triple the design estimated quantities (43,445 m3 actual vs 14,300 m3 design)

- Shortage of bedrock within the footprint area required use of alternative sources of feed material to produce the needed granular fill
- In addition, much of the overburden within the footprint area was assessed as being ice-rich silt till and was deemed unsuitable for backfill material within the planned laydown area. Disposal of this material occurred either within the designated waste dump area north of the laydown or within "deep" fills (greater than 1.5 m) within the laydown 3 area.
- Additional excavation efforts were therefore required to reach either a competent bedrock surface (13.5 ML tank pedestal) or a minimum 1.5 m additional depth below the design depth and backfilled with 0-200 mm material within the affected containment area in order to minimize thaw settlement which could potentially impact the liner

4. Rock Face Scaling (June 19 – June 22)

- As excavation progressed in depth, the north and west rock walls were exposed
- Although pre-shear blasting controlled some of the end product of the walls, the final high walls required cleaning/scaling due to the blocky nature of the rock
- Inspections of the free face were conducted by AEM Engineering personnel on three occasions: pre-scaling (June 19), post-scaling (June 22) and a final inspection on June 29
- 2 large rock blocks identified defined by sub-horizontal faults filled with ice-rich silt gouge
- Faulting largely covered with the containment berm which is expected to provide both a buttressing effect and some thermal protection
- Survey monuments to be installed to monitor movements

5. Overburden Pushback and Protection Berm (July 15 to August 1)

- Overburden removed from bedrock for a distance of 3 m from the edge of the north high wall
- In those areas where bedrock was either not encountered or was a lower elevation than expected from design n the high wall (RFI 09), the overburden was sloped back at a 2H:1V angle and protected with a fillet of thaw-stable 0-600 mm minus blast rock material.
- The 600 mm minus tied into both the containment berm and the protection berm around the excavation area
- Protection berm consisted of till removed from the tank farm excavation and the core covered with 0-600 mm minus blast rock material.

6. Under Liner Material Placement (June 10 to September 26)

7.1 Floor

- To compensate for the lack of bedrock, protect the underlying permafrost and provide a trafficable surface for haul traffic, placement of 600 mm minus blast rock began in the southwest and southern areas of the containment area
- Material placement closely followed the additional excavation of this area to avoid unnecessary disturbance of the thermal regime
- The 600 mm minus was placed in controlled lifts and compacted with the 10-tonne vibratory compactor
- Backfill within the tank pedestals consisted of placement of 0-200 mm material directly on bedrock – 0-200 mm was placed in controlled lifts and compacted with the 10-tonne vibratory compactor

- Within the tank pedestals and the 13.5 ML tank containment area, 30 mm minus under liner was placed on either the 0-600 mm material (containment area) or 0-200 mm (pedestals). The 0-30 mm material was placed in controlled lifts and compacted with the 10-tonne vibratory compactor
- Under liner material placement in the containment area around the 20 ML tank was revised as per RFI 12, with 100 mm of the 30 mm minus under liner bedding being replaced with sand
- As RFI 12 was released during placement of 30 mm minus under liner material, 100 mm was removed and replaced with sand.

6.2 Containment Berm (June 24 to September 26)

- The 600 mm minus core was placed in controlled, compacted lifts, then the 30 mm minus placed with an excavator on top and bucket tamped into place.

7. Liner System Installation (July 14 to October 6)

- Solmax Textured 60 mil HDPE installed throughout and 540 g/m2 geotextile
- Full order was purchased by AEM in 2015 and was stored outside in MTKSL's equipment yard prior to installation - approximately 15% of this order was discovered to have been damaged and was unusable due to improper storage and handling procedures
- Installation of the liner system occurred in two phases in order to facilitate full construction of the 13.5 ML tank and partial construction of the 20 ML tank in 2017
- Liner on the tank pedestal footprints was completed first (July 14 to July 16), the 13.5 ML tank and first three rings of the 20 ML tank were erected, then liner installation proceeded throughout the remainder of the containment area (September 12 to October 6)
- Liner on the tank pedestals was protected with plywood after installation and before the remaining liner was installed
- Liner installation QA was carried out by AEM and quality control testing by Texel

8. Tank Erection (July 29 to September 8)

- Civil earthworks within the Tank Farm area was generally suspended during erection of the 13.5 ML tank and partial erection of the 20 ML tank

9. Over Liner Material Placement (July 16 to October 9)

- Over liner material placement on the tank pedestals and in the 13.5 ML tank containment area followed the original design specification of placement of 30 mm minus placed on geotextile placed on HDPE
- Sand directly under the tank footprints was placed by Inukshuk July 27 to August 1. As per ECN-02 and RFI-13, the 1V:120H slope under the tanks was backfilled entirely with sand.
- Following RFI 12 however, within the 20 ML tank containment area, 100 mm of sand was placed directly on the HDPE, covered with geotextile, then covered with 200 mm of 30 mm minus

Equipment Used for Construction (MTKSL):

- CAT D8 Bulldozer
- CAT D6 Bulldozer
- CAT 330L Excavator
- CAT 345C Excavator
- CAT 320 Excavator
- CAT 980 Loader
- CAT IT62
- CAT skid steers
- CAT 740 articulated haul trucks
- CAT CS56 10-ton vibratory drum compactor
- HAMM 5-ton vibratory drum compactor
- Various small hand-pushed compactors

QA/QC Summary

1. Bedrock conditions under the tank pedestal areas were verified by AEM.

2. Suitability of overburden material for use as laydown backfill/waste was assessed by AEM. When deemed unsuitable for use as laydown backfill, the overburden was hauled to the overburden waste disposal area immediately south of the Laydown 3 area.

3. 600 mm minus and 200 mm minus was placed according to the Technical Specifications for Civil Earthworks Revision 3 (6515-GNS-014, June 6, 2017). Compaction efforts consisted of a minimum number (4) of passes with a 10-tonne vibratory compactor. Suitability for placement and compaction efforts were assessed visually and approved by AEM.

4. 30 mm minus was placed and compacted (under liner) according to the Technical Specifications for Civil Earthworks (6515-GNS-014, June 6, 2017). Compaction efforts consisted of a minimum number (4) of passes with a 10-tonne vibratory compactor and were visually assessed and approved by AEM.

5. A total of thirty (30) samples of 30 mm minus crushed material were tested for moisture content and particle size analysis (results attached). Due to the nature of the feed material (blasted quarry rock), the material was generally low on particles sized between 0.63 mm and 14 mm with a low average moisture content (0.7%)

6. Texel Geosol was responsible for all quality control of the liner installation process.

APPENDIX O

Particle Size Summary – 30 mm minus

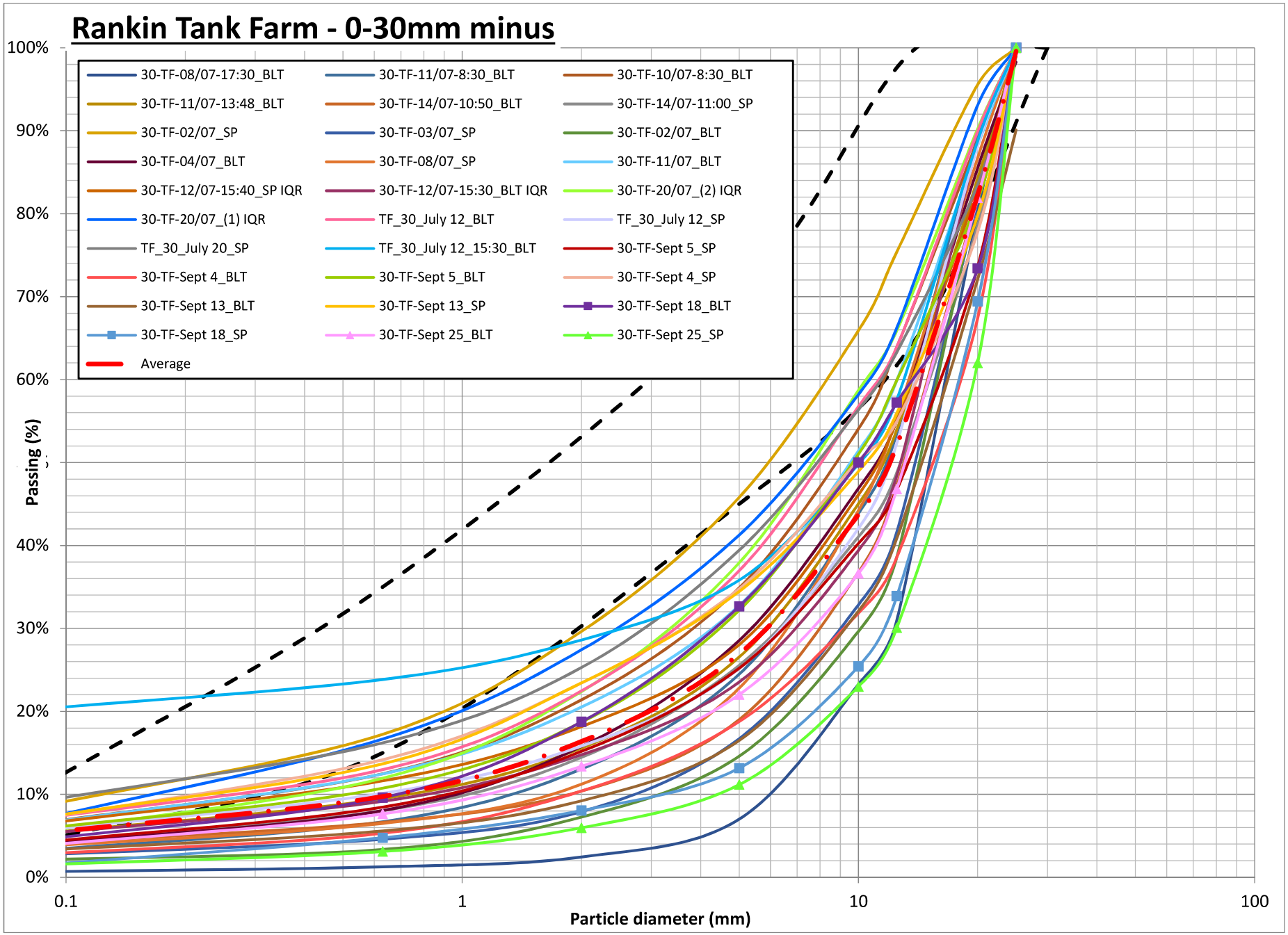
Rankin Tank Farm - 0-30mm minus
100%
90%
80%
70%
60%
40%
30%
20%
10%
0%
Passing (%)
0.1
1
10
100
Particle diameter (mm)
30-TF-08/07-17:30_BLT
30-TF-11/07-8:30_BLT
30-TF-10/07-8:30_BLT
30-TF-11/07-13:48_BLT
30-TF-14/07-10:50_BLT
30-TF-14/07-11:00_SP
30-TF-02/07_SP
30-TF-03/07_SP
30-TF-02/07_BLT
30-TF-04/07_BLT
30-TF-08/07_SP
30-TF-11/07_BLT
30-TF-12/07-15:40_SP IQR
30-TF-12/07-15:30_BLT IQR
30-TF-20/07_(2) IQR
30-TF-20/07_(1) IQR
TF_30_July 12_BLT
TF_30_July 12_SP
TF_30_July 20_SP
TF_30_July 12_15:30_BLT
30-TF-Sept 5_SP
30-TF-Sept 4_BLT
30-TF-Sept 5_BLT
30-TF-Sept 4_SP
30-TF-Sept 13_BLT
30-TF-Sept 13_SP
30-TF-Sept 18_BLT
30-TF-Sept 18_SP
30-TF-Sept 25_BLT
30-TF-Sept 25_SP
Average

Table 1: Summary of Particle Size Analysis Results - 30 mm minus Rankin Inlet Tank Farm

No.	Sample ID	Sieve Size (mm)								Moisture Content
		25.00	20.00	12.50	10.00	5.00	2.00	0.63	0.08	
1	30-TF-02/07_SP	100.0%	95.6%	75.4%	65.9%	45.8%	29.6%	17.2%	8.2%	0.34%
2	30-TF-03/07_SP	100.0%	81.6%	41.7%	32.8%	16.7%	7.9%	4.6%	2.6%	0.10%
3	30-TF-02/07_BLT	98.9%	82.3%	38.6%	29.7%	14.6%	7.2%	3.4%	2.1%	0.10%
4	30-TF-04/07_BLT	98.3%	85.5%	55.1%	46.9%	28.5%	15.8%	8.0%	3.8%	1.08%
5	30-TF-08/07_SP	100.0%	86.7%	55.5%	44.2%	22.8%	11.2%	6.5%	3.6%	0.22%
6	30-TF-11/07_BLT	100.0%	88.2%	59.9%	51.4%	32.8%	20.5%	12.5%	6.2%	0.29%
7	30-TF-08/07-17:30_BLT	100.0%	80.2%	31.0%	23.3%	7.0%	2.4%	1.3%	0.6%	0.65%
8	30-TF-11/07-8:30_BLT	100.0%	89.4%	53.5%	43.8%	24.5%	13.1%	6.7%	3.1%	0.49%
9	30-TF-10/07-8:30_BLT	100.0%	88.8%	63.9%	54.1%	34.9%	21.4%	12.5%	6.3%	0.71%
10	30-TF-11/07-13:48_BLT	100.0%	84.3%	53.9%	45.0%	26.5%	15.6%	9.5%	5.1%	0.38%
11	30-TF-14/07-10:50_BLT	100.0%	82.1%	47.3%	36.8%	19.0%	10.4%	6.6%	4.0%	0.48%
12	30-TF-14/07-11:00_SP	100.0%	78.6%	48.8%	41.0%	25.6%	14.5%	8.0%	4.0%	0.43%
13	30-TF-12/07-15:40_SP IQR	100.0%	83.2%	55.1%	46.1%	28.0%	18.2%	11.6%	6.2%	0.39%
14	30-TF-12/07-15:30_BLT IQR	100.0%	88.5%	48.4%	39.4%	23.5%	14.8%	9.2%	5.1%	0.44%
15	30-TF-20/07_(1) IQR	100.0%	93.1%	66.2%	58.2%	41.3%	27.4%	16.7%	6.7%	0.73%
16	30-TF-20/07_(2) IQR	100.0%	90.2%	65.9%	58.7%	37.9%	22.4%	11.9%	5.2%	0.73%
17	TF_30_July 12_BLT	100.0%	89.9%	63.9%	56.7%	37.0%	22.5%	13.0%	6.8%	0.80%
18	TF_30_July 12_SP	100.0%	88.2%	52.3%	42.1%	25.2%	15.8%	10.1%	5.5%	0.27%
19	TF_30_July 20_SP	100.0%	83.5%	63.3%	56.4%	39.4%	25.3%	16.2%	8.9%	0.71%
20	TF_30_July 12_15:30_BLT	100.0%	88.8%	57.6%	49.8%	35.8%	28.6%	23.8%	20.2%	0.31%
21	30-TF-Sept 5_SP	100.0%	73.6%	46.7%	40.2%	25.2%	15.2%	8.5%	4.0%	0.34%
22	30-TF-Sept 4_BLT	100.0%	67.4%	38.6%	31.8%	18.8%	10.4%	5.3%	2.7%	0.22%
23	30-TF-Sept 5_BLT	100.0%	81.6%	59.9%	51.0%	32.2%	18.7%	10.7%	5.7%	0.48%
24	30-TF-Sept 4_SP	100.0%	77.8%	55.0%	50.2%	34.8%	23.4%	14.2%	6.8%	1.07%
25	30-TF-Sept 13_BLT	90.1%	72.1%	40.9%	32.1%	16.5%	9.2%	5.6%	3.2%	0.75%
26	30-TF-Sept 13_SP	100.0%	79.8%	56.0%	48.9%	34.5%	23.4%	13.7%	6.9%	0.97%
27	30-TF-Sept 18_BLT	100.0%	73.4%	57.2%	50.0%	32.6%	18.7%	9.6%	4.3%	0.96%
28	30-TF-Sept 18_SP	100.0%	69.4%	33.9%	25.4%	13.2%	8.0%	4.8%	1.4%	3.08%
29	30-TF-Sept 25_BLT	100.0%	81.9%	46.8%	36.6%	22.0%	13.4%	7.6%	3.7%	1.39%
30	30-TF-Sept 25_SP	100.0%	62.0%	30.1%	23.0%	11.2%	6.0%	3.1%	1.4%	1.25%
Average		**99.6%**	**82.3%**	**52.1%**	**43.7%**	**26.9%**	**16.4%**	**9.7%**	**5.1%**	**0.7%**

Required Test Frequency (1/XX)=	500	m3
Design Quantity =	9545	m3
No. Tests Required =	19	

APPENDIX P

Inspection Reports – Visit Reports for Final Wall Inspection

RANKIN TANK FARM – FINAL WALL - VISIT REPORT

Date: June 21st, 2017

From: Vanessa Smith

To: Jack Dutil, Mark Long, Stephane Gionest,

Cc: Éric Côté, Philemon Desrochers Gagnon, Philippe Lapointe, Véronique Falmagne, Christopher Penna.

THIS REPORT IS A SUMMARY OF THE RECOMMENDATION MADE TO SUPPORT THE TANK FARM AREA FINAL WALL AS REQUESTED BY THE RANKIN CONSTRUCTION TEAM.

The Rankin fuel tank farm laydown area was visited on Monday June 19, 2017 by Veronique Falmagne, Senior Mining Advisor, Vanessa Smith, Mine Engineer, and Philippe Lapointe, Engineering Superintendent. We were met on site by Stephane Gionet and inspected the northeast wall area. The northwest wall and corner were not cleaned out and were not as visible.

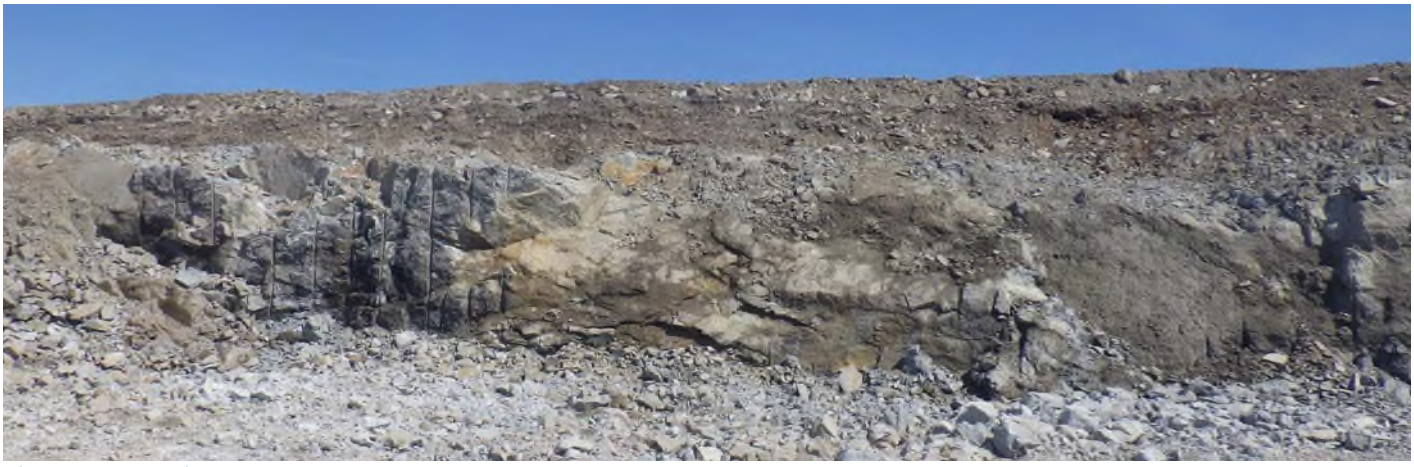

Figure 1 - Inspection area

From what could be observed, the rock quality is good on the northwest wall except near the north corner where a fault zone can be seen. The fault zone seems to be trending Southeast-Northwest approximately parallel to the northwest wall. The corner area appears to be in bad ground and will require further assessment once the blast has been cleared out.

Elsewhere the rock is good and half barrels are clearly visible along the northwest wall and part of the Northeast wall that was exposed. Large blocks will have to be scaled down and at least one area on the northeast wall may require re-blasting.

Recommendations provided during the visit include:

- Scrape and push back overburden at least 5 m from the crest then sloped to 1V:3H as indicated on the plan and covered with rock to maintain long term stability.

- The northwest corner will break back farther due to the fault zone and looks lower than the rest of the wall. In this area it will be necessary to clean out the blast and remove, then slope the broken / weak fault material. The overburden will need to be scraped back and sloped from the final crest location. Therefore it may need to be done in two passes.

- The face should be screened and bolted as a preventive measure to reduce long term deterioration from freeze/thaw action and mitigate liability of loose falling on bystanders. Regardless of the plan to fence the area, the easy accessibility of the site and location within the community puts the area at high risk of trespassing.

A follow-up inspection will be carried out tomorrow, June 22, 2017 to assess the scaling which has been carried out over the past days.

Should you have any question, do not hesitate to contact the Engineering department,

Regards,

Vanessa Smith, P. Eng.
Mine Engineer
Meliadine Project

RANKIN TANK FARM – FINAL WALL INSPECTION #2 - VISIT REPORT

Date: June 29th, 2017

From: Vanessa Smith

To: Jack Dutil, Mark Long, Stephane Gionest,

Cc: Éric Côté, Philemon Desrochers Gagnon, Philippe Lapointe, Véronique Falmagne, Christopher Penna.

THIS REPORT IS A SUMMARY OF THE SECONE INSPECTION CONDUCTED ON JUNE 22ND ONCE SCALING ACTIVIITES WERE COMPLETED IN THE TANK FARM AREA FINAL WALL AS REQUESTED BY THE RANKIN CONSTRUCTION TEAM.

The Rankin fuel tank farm laydown area was visited for a second inspection on Thursday June 22, 2017 following the requested scaling of the final wall area. Stephane Gionet was present for the second inspection of the northeast wall area. The northwest wall and corner were completely cleaned out and visible for this second inspection.

Figure 1 - Inspection area after scaling

Figure 2 - Inspection area after scaling – showing fault

Figure 2 shows some smaller rocks which should be removed as part of the final scaling. The rock quality is good on the northwest wall except near the north corner where a fault zone can be seen. The fault zone seems to be trending Southeast-Northwest approximately parallel to the northwest wall. This area continues to be of concern for the long term stability of the area. This structure has up to 6-inches of frozen gauge within (Figure 3).

Figure 3 – Fault Gauge – measured thickness (Photo taken by J. Pyliuk, Tetratech)

Figure 4 - Inspection area after scaling

Figure 4 shows the size of the blocks which were scaled since the previous inspection allowing for a proper inspection of the area. Figure 5 also shows the amount of scaling conducted; the drill rod was uncovered in the lasted area. The half barrels are clearly visible along the northwest wall and part of the Northeast wall that are fully exposed.

Figure 5 - Inspection area after scaling – corner area

Recommendations provided during the visit include:

- Final scaling for smaller blocks remains to be done.
- Scrape and push back overburden at least 5 m from the crest then sloped to 1V:3H as indicated on the plan and covered with rock to maintain long term stability.
- Screened and bolting of the final wall area remains to the discretion of the construction department and Tetratech. Following the removal of the larger blocks in the area the condition of the area has improved. The area which remains of concern due to deterioration from freeze/thaw action is the fault area. A proposal to create a thermal cap in this area was discussed with Tetratech. This area would have to be cleaned of any loose/melted gauge (pressure washer or other). Then a form would be built to retain the grout within/along the fault area to act as a thermal seal and infill for the open fault.

Should you have any question, do not hesitate to contact the Engineering department,

Regards,

Vanessa Smith, P. Eng.
Mine Engineer
Meliadine Project

APPENDIX Q

Inspection Report – Blasting Operation, Survey and Monotoring

EXPLOTECH

Specialists in Explosives, Blasting and Vibration
Consulting Engineers

October 6, 2017

Agnico Eagle Mines Ltd.
Meliadine Project
Rankin Inlet, Nunavut, Canada
X0C 0G0

Attention: Mr. Mark Long

Re: Department of National Defence Personal Accommodation Building
Final Report for Blasting Operations for Laydown Yard/Tank Farm and Itivia Pit Quarry
Rankin Inlet, Nunavut
April 25, 2017 to September 28, 2017

Dear Mr. Long,

Please accept this report as a comprehensive synopsis of all actions and items corresponding to the undertaken Blasting Operations for the Laydown Yard/Tank Farm and Itivia Pit Quarry as it directly relates to the Department of National Defence (DND) Personal Accommodation Building located in Rankin Inlet, Nunavut.

As a brief summary, a pre-blast inspection survey of the DND Personal Accommodation Building was completed on April 25, 2017 prior to the start of blasting at the Laydown Yard/Tank Farm. Following the completion of that blasting campaign, a post-blast survey was completed on June 15, 2017. Details on the comparative review between the pre and post blast surveys for the DND Personal Accommodation Building has been included in this report. This report also details the results of the vibration monitoring program developed and implemented in response to the blasting operations for the Laydown Yard/Tank Farm and Itivia Pit Quarry Project in Rankin Inlet, Nunavut. A comprehensive vibration monitoring program involving seismographs installed at representative locations around the blasting areas was in place from April 25, 2017 through September 28, 2017, which included a seismograph specifically installed at the DND property in question from April 25, 2017 to June 15, 2017. This program was implemented to measure vibrations adjacent to the blasting operations in order to guard against possible adverse impacts on the surrounding structure.

Historically, blasting operations attract a great deal of attention from occupants of buildings immediately adjacent to the project. Blasting tends to be highly visible, often noisy and occasionally a disruptive imposition on the day-to-day activities of the local community. Inhabitants of buildings close to the blasting may feel vibrations from the operation and as a result, become much more conscious of many of the previously unnoticed cracks, water stains, and similar defects in their homes and offices. Though there is an intuitive belief by most occupants that if they can feel the blast vibrations they must be damaging, these vibrations typically induce far lower strains on building components than the day-to-day environmental stresses that maintain every structure in a dynamic state. The combination of low particle velocities and frequencies beyond the natural frequencies of most structures generated by blasting and construction equipment are typically not damaging.

Pre-blast inspection surveys are often performed as a means of alleviating concerns expressed by building owners in close proximity to construction and blasting operations and to provide a baseline for assessing and evaluating complaints of damage following the completion of construction operations. With regards to the pre and post blast surveys completed at the DND Personal Accommodation Building, a visual inspection of all rooms located on the first floor of the structure was conducted, with all documented observations recorded by hand in a log book due to security concerns. Pre-existing defects that were observed and recorded were primarily cosmetic cracks in the drywall adjacent to windows, corners, door jams and plaster joints. In addition to the numerous drywall cracks, several screws protruding through the drywall (screw pops) were commonly noted throughout the structure.

During the interim period between the pre and post-blasting inspection surveys, the plumbing located in the North West wing of the building had frozen and subsequently burst creating flooding in a large portion of the main floor area. At the time of the June 15, 2017 post-blast inspection survey, many access points had been cut into the drywall to accommodate the extensive plumbing repairs required. These changes were excluded from the post-blast inspection survey as they were deemed to be external

influences not related to the blasting operations. For the remainder of the building that was unaffected by the plumbing repairs, no notable changes were observed relating to the blasting or construction operations.

A full time on-site Vibration Monitoring Program was implemented to delineate vibration intensities experienced at specific structures in the vicinity of the work. Vibration monitoring sensors listed below were installed at the nearest properties prior to the commencement and during the progression of both listed blasting operations on site:

Laydown Yard/Tank Farm Blasting Operations - April 2017 to June 2017

- **BE9028:** Nuna Logistics – Geophone sandbagged on ground at the Northwest corner of the trailer on Itivia Street. Linear Microphone installed in the direction of the blasting.
- **BE15860:** DND Barracks – Geophone sandbagged on carpet inside Room 166 in the Southern corner of the DND Personal Accommodation Building (Barracks). No Linear Microphone installed.
- **BE18909:** Old Ila Apartment – Geophone sandbagged on ground underneath the South end of the apartment building. Linear Microphone installed on the outside of the wooden plywood enclosure in the direction of the blasting.
- **BE21127:** Nunavut Excavating (Trailer) – Geophone sandbagged on ground at the Southwest corner of the trailer on Itivia Street. Linear Microphone installed in the direction of the blasting.

Itivia Pit Quarry - June 2017 to September 2017

- **BE9028:** Nuna Logistics – Geophone sandbagged on ground at the Northwest corner of the trailer on Itivia Street. Linear Microphone installed in the direction of the blasting.
- **BE18909:** Old Ila Apartment – Geophone sandbagged on ground underneath the South end of the apartment building. Linear Microphone installed on the outside of the wooden plywood enclosure in the direction of the blasting.
- **BE21127:** Nunavut Excavating (Trailer) – Geophone sandbagged on ground at the Southwest corner of the trailer on Itivia Street. Linear Microphone installed in the direction of the blasting.
- **BE8446:** Nunavut Excavating (Shop) – Geophone sandbagged on ground along the South side of the new shop. Linear Microphone installed in the direction of the blasting.
- **BE7369:** Muster Point Itivia – Geophone sandbagged on the ground under the steel base of the temporary electrical service at the muster point on Itivia Street.

The monitoring instruments installed consisted of Instantel tri-directional digital seismographs capable of measuring ground vibration intensities up to 254mm/s and air overpressures up to 148dB(L) at a frequency response of 2 – 250Hz. The units were programmed to measure all vibration levels continuously at a sampling rate of 1024 samples per second. Following each five or fifteen minute interval, the units reviewed the 307,200 or 921,600 measured vibrations and permanently recorded the peak particle velocity for that time interval while deleting all subordinate vibration intensities. This process was repeated for all subsequent five or fifteen minute time intervals thereby providing maximum vibration intensities experienced at the structure throughout the day. Such a configuration permits continuous monitoring of vibration levels and provides complete coverage of all vibrations, construction induced or otherwise, experienced at the monitor locations. Events recorded under this program mode are marked by an “H” on the enclosed vibration summary report.

As an additional analytical tool, the seismographs were configured to record a more detailed waveform in the event that vibration intensities exceeded a pre-set trigger level set at 2 mm/s or 5mm/s depending on the installation location. This feature permits advanced analysis in the event that elevated readings are recorded. Events recorded under this program mode are marked by a “W” on the enclosed vibration summary report.

Particle velocity is the descriptor of choice when dealing with vibrations because of its superior correlation with the appearance of cosmetic cracking. While particle velocities provide one measurement statistic, structural response to varied frequency necessitates the inclusion of frequency analysis in all vibration measurement. As such, the United States Bureau of Mines developed a set of criteria utilizing a graded scale incorporating reduced permissible particle velocities at reduced dominant frequencies (Refer to Figure 1). This set of criteria is now almost universally accepted as the basis for controlling blast and construction induced vibrations. This is not to say that damage automatically occurs once these levels are breached and, in fact, threshold damage would not occur in the average residence until ground vibrations reached significantly higher intensities than those listed. Damage as a result of transient vibrations at particle intensities below the above noted USBM threshold limits has never been scientifically observed.

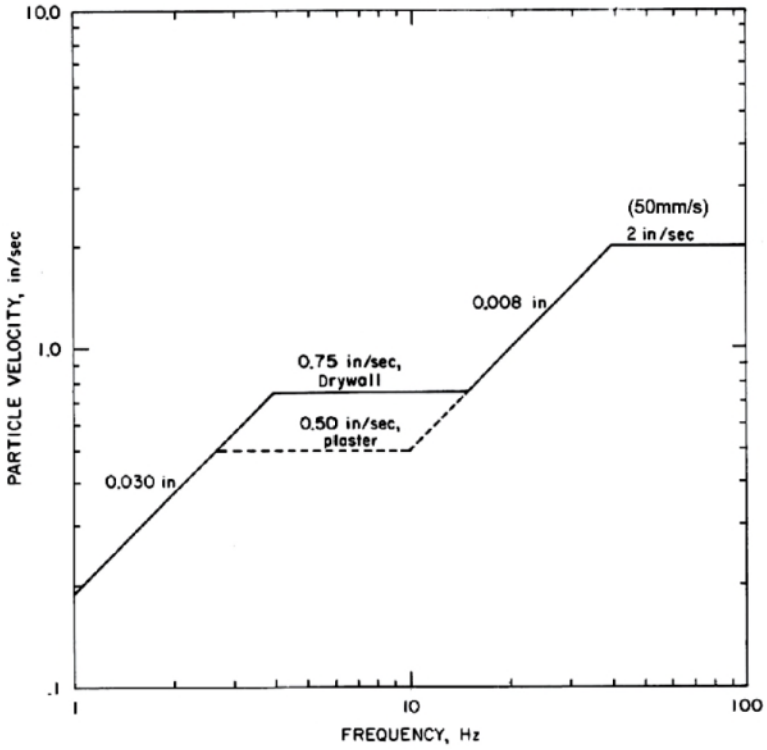

Figure 1 – USBM Z-Curve

It is an intrinsic nature of blast induced vibrations that these vibrations decrease with increasing distance. Under typical conditions, the vibration intensity decreases by two thirds of its previous value for every doubling of distance. That is to say that a peak particle velocity measurement of 100mm/s at a distance of 100 m from the blast location will have decreased to 33.3mm/s at a separation distance of 200m and 11.1 mm/s at a separation distance of 400m. While the nature of the transmitting medium (rock, earth, water) and presence of joint sets, fractures, faults and shear zones will all impact the rate of decay of the ground vibrations, the fact that within consistent media, intensities diminish with distance is unavoidable.

In regards to the blasting operations as part of the Laydown Yard/Tank Farm and Itivia Pit Project, Explotech Engineering recommended that Ontario Provincial Standard Specification (OPSS) 120, *General Specification for the Use of Explosives,* was implemented. This specification is merely a simplification of the aforementioned USBM Z-Curve and limits ground vibrations to 50mm/s for frequencies at or above 40Hz and

20mm/s for frequencies below 40Hz. Damage as a result of transient vibrations at particle intensities below these threshold limits have never been scientifically observed.

A review of the data collected on the project confirms that all of the recorded or predictable vibrations attributable to the blasting or construction operations resided below 11mm/s. The maximum vibration reading recorded at the DND Personal Accommodation Building during the Laydown Yard/Tank Farm blasting operations was a 10.67mm/s at a dominant frequency of 28.75Hz, recorded on May 19, 2017 at 17:52.

Following the completion of the blasting operations for the Laydown Yard/Tank Farm, operations were relocated to the Itivia Pit Quarry, situated approximately 700m removed from the DND Personal Accommodation Building. In order to ensure the closest structures to the blasting were monitored at all times, the seismograph located at the Personal Accommodation Building was relocated to the Muster Point on Itivia Street. This location served as the new closest point to quarry blasting (approximately 200m) and was situated directly in between the Personal Accommodation Building and quarry blasting. The maximum vibration recorded at the Muster Point on Itivia Street was a 5.842mm/s at a dominant frequency of 39.25Hz on July 6, 2017 at 7:59. With consideration for the attenuation of the vibrations over the additional 500m to the DND Personal Accommodation Building, the vibrations induced on the property would have resided below 3mm/s.

Vibration induced damage associated with blasting operations has never been observed at the measured and predictable intensities experienced at the subject property and consequently, attribution of any physical defects to the blasting operations is scientifically unjustifiable. While vibrations of this intensity would be clearly perceptible and may cause minor excitation in some items, knick-knacks and wall hangings, they would be insufficient to initiate damage in even historical or unusual structures.

Based on our inspections and subsequent comparison, as well as the vibration monitoring data measured and predicted throughout both blasting campaigns, it is our

opinion that the blasting operations undertaken in Rankin Inlet have not initiated any changes to the property located at Department of National Defence (DND) Personal Accommodation Building. We trust this information will prove beneficial and will assist in alleviating any concerns of damage to the building as a result of the blasting operations. Should you or the property representatives have any questions or additional concerns related to this brief report, we welcome the opportunity to address these at your leisure.

Kindest regards,

Brent McClelland, B.Eng.
Explotech Engineering Ltd.

Mitch Malcomson, P.Eng. (ON)
Explotech Engineering Ltd.

Rankin Inlet Laydown Yard/Tank Farm
M7704A - Nuna Logistics
April 25, 2017 to June 15, 2017

Event Report: Event List - z:\7. monitoring data\archived seismo readings\m77xx\m7704a - nunalogistics - rankin

Type	Serial No.	Date/Time	Trigger	Tran Peak (mm/s)	Vert Peak (mm/s)	Long Peak (mm/s)	PVS1 (mm/s)	Description
H	BE15860	Apr 25 /17 12:39:26	Manual	0.635	1.270	0.508	1.374	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	Apr 26 /17 06:51:29	Manual	0.508	0.635	0.381	0.660	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	Apr 27 /17 06:02:54	Manual	0.889	1.143	0.762	1.198	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	Apr 27 /17 13:57:55	Manual	0.508	1.397	0.508	1.470	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	Apr 28 /17 06:02:52	Manual	0.889	1.778	0.889	1.836	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	Apr 29 /17 06:02:36	Manual	0.762	2.032	1.016	2.083	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	Apr 29 /17 12:58:47	Vert	0.762	2.032	1.016	2.083	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	Apr 29 /17 13:02:03	Manual	0.635	2.159	0.762	2.178	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	Apr 29 /17 17:00:59	Vert	0.635	2.159	0.762	2.178	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	Apr 29 /17 17:05:01	Manual	0.254	0.381	0.254	0.475	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	Apr 30 /17 06:02:37	Manual	0.889	2.159	1.143	2.225	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	Apr 30 /17 12:59:34	Vert	0.889	2.159	1.143	2.225	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	Apr 30 /17 13:02:51	Manual	0.889	1.778	1.143	1.955	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 1 /17 06:02:36	Manual	0.889	2.032	1.143	2.110	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 1 /17 13:29:51	Vert	0.889	2.032	0.889	2.110	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 1 /17 13:33:04	Manual	0.762	1.778	0.889	1.823	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 2 /17 06:02:35	Manual	0.762	2.032	0.889	2.083	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 2 /17 08:07:47	Vert	0.762	2.032	0.889	2.083	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 2 /17 08:11:01	Manual	1.651	3.175	1.778	3.248	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 2 /17 13:31:13	Vert	1.651	3.175	1.778	3.248	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 2 /17 13:34:30	Manual	1.397	2.667	1.905	2.715	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 2 /17 18:00:12	Vert	1.397	2.667	1.905	2.715	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 2 /17 18:03:30	Manual	0.254	0.635	0.254	0.648	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 3 /17 06:02:36	Manual	1.651	7.112	1.905	7.140	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 3 /17 08:08:13	Vert	1.651	7.112	1.905	7.140	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 3 /17 08:11:27	Manual	1.524	4.445	2.159	4.461	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 3 /17 13:29:51	Vert	1.524	4.445	2.159	4.461	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 3 /17 13:33:07	Manual	2.413	5.207	2.540	5.511	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 3 /17 18:00:24	Vert	2.413	5.207	2.540	5.511	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 3 /17 18:03:40	Manual	1.016	1.016	0.762	1.397	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 4 /17 06:02:34	Manual	1.143	2.413	1.143	2.446	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 4 /17 08:00:53	Vert	1.143	2.413	1.143	2.446	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 4 /17 08:04:08	Manual	2.032	5.969	2.286	5.982	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 4 /17 13:31:52	Vert	2.032	5.969	2.286	5.982	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 4 /17 13:35:58	Manual	1.270	3.175	1.905	3.343	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 4 /17 18:01:10	Vert	1.270	3.175	1.905	3.343	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 4 /17 18:04:29	Manual	0.635	2.159	0.508	2.163	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 4 /17 20:08:23	Vert	0.381	2.159	0.508	2.163	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 4 /17 20:11:40	Manual	0.635	0.635	0.508	0.823	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 5 /17 06:02:36	Manual	1.524	3.429	1.905	3.508	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 5 /17 08:00:03	Vert	1.524	3.429	1.905	3.508	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 5 /17 08:03:19	Manual	1.143	3.048	1.905	3.093	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 5 /17 13:30:58	Vert	1.143	3.048	1.905	3.093	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 5 /17 13:34:17	Manual	0.889	1.778	1.270	1.818	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 6 /17 06:02:36	Manual	2.286	4.191	2.540	4.581	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 6 /17 08:00:04	Vert	2.286	4.191	2.540	4.581	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 6 /17 08:03:17	Manual	1.143	3.683	1.905	3.953	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 6 /17 13:30:36	Vert	1.143	3.683	1.905	3.953	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 6 /17 13:34:01	Manual	1.651	4.572	2.032	4.752	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 6 /17 18:00:56	Vert	1.651	4.572	2.032	4.752	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 6 /17 18:06:24	Manual	0.635	0.635	0.635	0.907	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 7 /17 06:03:22	Manual	2.032	3.556	2.286	3.772	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 7 /17 07:59:55	Vert	2.032	3.556	2.286	3.772	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 7 /17 08:03:07	Manual	1.651	3.810	2.413	3.921	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 7 /17 13:29:52	Vert	1.651	3.810	2.413	3.921	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 7 /17 13:33:13	Manual	1.905	4.191	2.540	4.798	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 7 /17 18:14:54	Vert	1.905	4.191	2.540	4.798	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 7 /17 18:25:12	Manual	0.254	0.508	0.254	0.508	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 8 /17 06:02:35	Manual	2.159	4.953	3.302	5.134	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 8 /17 07:59:44	Vert	2.159	4.953	3.302	5.134	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 8 /17 08:03:40	Manual	1.143	2.413	1.143	2.469	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 8 /17 10:47:52	Vert	1.143	2.413	1.016	2.469	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 8 /17 10:52:33	Manual	2.667	5.207	3.175	5.464	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 8 /17 17:58:03	Vert	2.667	5.207	3.175	5.464	DND Barracks, Rankin Inlet, Nunavut

Rankin Inlet Laydown Yard/Tank Farm
M7704A - Nuna Logistics
April 25, 2017 to June 15, 2017

Event Report: Event List - z:\7. monitoring data\archived seismo readings\m77xx\m7704a - nunalogistics - rankin

Type	Serial No.	Date/Time	Trigger	Tran Peak (mm/s)	Vert Peak (mm/s)	Long Peak (mm/s)	PVS1 (mm/s)	Description
H	BE15860	May 8 /17 18:01:17	Manual	1.016	2.032	0.762	2.048	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 8 /17 22:27:36	Vert	0.508	2.032	0.635	2.048	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 8 /17 22:31:00	Manual	1.143	1.524	1.016	2.036	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 9 /17 06:02:33	Manual	1.905	3.937	2.667	4.154	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 9 /17 07:59:38	Vert	1.905	3.937	2.667	4.154	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 9 /17 08:05:10	Manual	1.143	2.921	1.016	2.989	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 9 /17 11:15:49	Vert	1.143	2.921	0.889	2.989	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 9 /17 11:19:03	Manual	2.032	4.953	2.413	5.058	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 9 /17 13:29:37	Vert	2.032	4.953	2.413	5.058	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 9 /17 13:33:38	Manual	1.524	3.683	1.778	3.797	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 9 /17 17:56:43	Vert	1.524	3.683	1.778	3.797	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 9 /17 18:00:02	Manual	0.254	0.508	0.254	0.524	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 10 /17 06:02:35	Manual	2.032	3.302	2.413	3.389	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 10 /17 07:59:26	Vert	2.032	3.302	2.413	3.389	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 10 /17 08:03:23	Manual	1.778	4.318	2.286	4.731	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 10 /17 17:59:35	Vert	1.778	4.318	2.286	4.731	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 10 /17 18:03:00	Manual	0.254	0.635	0.381	0.660	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 12 /17 06:29:25	Manual	2.921	4.572	2.286	4.728	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 12 /17 17:59:07	Vert	2.921	4.572	2.286	4.728	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 12 /17 18:02:22	Manual	0.381	0.762	0.381	0.783	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 13 /17 06:02:34	Manual	1.778	3.937	1.778	4.117	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 13 /17 13:30:00	Vert	1.778	3.937	1.778	4.117	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 13 /17 13:33:17	Manual	2.921	4.064	2.667	4.327	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 13 /17 17:52:00	Vert	2.921	4.064	2.667	4.327	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 13 /17 17:55:20	Manual	0.254	0.381	0.254	0.381	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 14 /17 06:02:34	Manual	2.286	4.699	3.429	5.127	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 14 /17 07:59:56	Vert	2.286	4.699	3.429	5.127	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 14 /17 08:03:07	Manual	2.159	8.509	2.540	8.548	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 14 /17 17:27:39	Vert	2.159	8.509	2.540	8.548	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 14 /17 17:30:58	Manual	0.254	0.635	0.254	0.648	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 15 /17 06:02:34	Manual	2.159	4.572	2.667	4.665	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 15 /17 07:59:51	Long	2.159	4.572	2.667	4.665	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 15 /17 08:06:47	Manual	1.270	1.651	1.397	1.955	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 16 /17 06:02:39	Manual	1.397	2.159	1.270	2.389	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 16 /17 08:00:04	Vert	1.397	2.159	1.270	2.389	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 16 /17 08:03:18	Manual	1.778	3.302	2.159	3.377	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 16 /17 17:56:54	Vert	1.778	3.302	2.159	3.377	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 16 /17 18:00:12	Manual	0.254	0.762	0.381	0.783	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 17 /17 06:02:34	Manual	1.651	4.953	1.778	4.981	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 17 /17 07:59:46	Vert	1.651	4.953	1.778	4.981	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 17 /17 08:03:06	Manual	2.413	5.334	2.540	5.496	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 17 /17 17:52:25	Vert	2.413	5.334	2.540	5.496	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 17 /17 17:55:47	Manual	0.254	0.508	0.254	0.524	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 18 /17 06:02:36	Manual	2.032	5.461	2.921	5.692	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 18 /17 07:56:39	Vert	2.032	5.461	2.921	5.692	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 18 /17 07:59:58	Manual	2.921	5.334	3.048	5.515	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 18 /17 17:52:56	Vert	2.921	5.334	3.048	5.515	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 18 /17 17:56:17	Manual	0.254	0.254	0.254	0.381	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 19 /17 06:02:34	Manual	2.286	4.953	2.540	5.149	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 19 /17 07:59:33	Vert	2.286	4.953	2.540	5.149	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 19 /17 08:02:46	Manual	2.159	10.67	3.048	10.84	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 19 /17 17:52:37	Vert	2.159	10.67	3.048	10.84	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 19 /17 17:55:54	Manual	0.254	0.635	0.254	0.648	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 20 /17 06:02:34	Manual	1.651	4.064	1.778	4.080	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 20 /17 07:59:49	Vert	1.651	4.064	1.778	4.080	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 20 /17 08:03:02	Manual	1.905	4.064	2.413	4.533	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 20 /17 17:58:27	Vert	1.905	4.064	2.413	4.533	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 20 /17 18:01:45	Manual	0.254	0.381	0.254	0.381	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 21 /17 06:02:34	Manual	1.524	3.429	1.778	3.524	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 21 /17 07:59:27	Vert	1.524	3.429	1.778	3.524	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 21 /17 08:02:40	Manual	1.397	2.540	1.270	2.753	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 21 /17 17:48:33	Vert	1.397	2.540	1.270	2.753	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 21 /17 17:51:49	Manual	0.254	0.254	0.254	0.381	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 22 /17 06:02:34	Manual	1.397	3.302	1.524	3.494	DND Barracks, Rankin Inlet, Nunavut

Rankin Inlet Laydown Yard/Tank Farm
M7704A - Nuna Logistics
April 25, 2017 to June 15, 2017

Event Report: Event List - z:\7. monitoring data\archived seismo readings\m77xx\m7704a - nunalogistics - rankin

Type	Serial No.	Date/Time	Trigger	Tran Peak (mm/s)	Vert Peak (mm/s)	Long Peak (mm/s)	PVS1 (mm/s)	Description
W	BE15860	May 22 /17 07:59:22	Vert	1.397	3.302	1.524	3.494	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 22 /17 08:02:40	Manual	1.651	6.350	2.413	6.356	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 22 /17 17:59:16	Vert	1.651	6.350	2.413	6.356	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 22 /17 18:02:36	Manual	0.254	0.889	0.381	0.898	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 23 /17 06:02:41	Manual	1.524	3.048	1.651	3.137	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 23 /17 07:54:35	Vert	1.524	3.048	1.651	3.137	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 23 /17 07:57:52	Manual	1.651	2.667	1.397	2.706	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 23 /17 17:59:38	Vert	1.651	2.667	1.397	2.706	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 23 /17 18:02:54	Manual	0.254	0.254	0.254	0.381	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 24 /17 06:02:35	Manual	2.159	5.334	3.175	5.816	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 24 /17 07:59:27	Vert	2.159	5.334	3.175	5.816	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 24 /17 08:02:43	Manual	1.016	3.429	1.016	3.497	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 24 /17 10:50:13	Vert	1.016	3.429	0.889	3.497	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 24 /17 10:57:11	Manual	2.159	9.779	2.667	9.918	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 24 /17 17:58:25	Vert	2.159	9.779	2.667	9.918	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 24 /17 18:01:44	Manual	0.254	0.254	0.254	0.381	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 25 /17 06:04:00	Manual	1.270	3.175	1.397	3.218	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 25 /17 07:58:23	Vert	1.270	3.175	1.397	3.218	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 25 /17 08:02:24	Manual	2.540	5.969	3.683	6.592	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 25 /17 17:59:14	Vert	2.540	5.969	3.683	6.592	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 25 /17 18:02:36	Manual	0.254	0.381	0.254	0.421	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 26 /17 06:02:34	Manual	0.762	4.191	0.889	4.216	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 26 /17 07:59:42	Vert	0.635	4.191	0.762	4.216	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 26 /17 08:02:57	Manual	0.508	1.270	0.762	1.283	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 27 /17 06:02:41	Manual	1.397	1.524	1.397	2.020	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 28 /17 06:02:36	Manual	1.270	2.794	1.651	2.843	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 28 /17 07:58:50	Vert	1.270	2.794	1.651	2.843	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 28 /17 08:02:05	Manual	1.397	3.302	1.524	3.372	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 28 /17 17:58:57	Vert	1.397	3.302	1.524	3.372	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 28 /17 18:02:13	Manual	0.381	0.889	0.381	0.907	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 29 /17 06:02:34	Manual	1.651	2.540	1.524	2.646	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 29 /17 07:59:45	Vert	1.651	2.540	1.524	2.646	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 29 /17 08:03:42	Manual	1.016	1.524	0.889	1.591	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 30 /17 06:02:36	Manual	0.889	2.794	1.905	2.794	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 30 /17 13:29:34	Vert	0.889	2.794	1.905	2.794	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 30 /17 13:32:52	Manual	2.159	4.064	1.778	4.229	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 30 /17 17:57:35	Vert	2.159	4.064	1.778	4.229	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 30 /17 18:00:54	Manual	0.381	0.889	0.381	0.889	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 31 /17 06:02:36	Manual	1.524	3.302	1.397	3.312	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 31 /17 07:58:32	Vert	1.524	3.302	1.397	3.312	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 31 /17 08:01:50	Manual	1.397	3.937	2.286	3.996	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	May 31 /17 13:31:32	Vert	1.397	3.937	2.286	3.996	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	May 31 /17 13:35:38	Manual	0.381	1.143	0.381	1.150	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	Jun 1 /17 06:02:36	Manual	1.778	5.969	3.302	6.409	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	Jun 1 /17 07:58:30	Vert	1.778	5.969	3.302	6.409	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	Jun 1 /17 08:02:40	Manual	1.905	5.842	3.302	5.922	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	Jun 1 /17 13:29:20	Vert	1.905	5.842	3.302	5.922	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	Jun 1 /17 13:32:42	Manual	1.143	2.159	1.016	2.338	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	Jun 1 /17 17:58:18	Vert	1.143	2.159	1.016	2.338	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	Jun 1 /17 18:01:41	Manual	0.254	0.508	0.254	0.524	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	Jun 2 /17 06:03:18	Manual	1.270	3.810	1.905	3.976	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	Jun 2 /17 07:59:25	Vert	1.270	3.810	1.905	3.976	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	Jun 2 /17 08:02:41	Manual	1.016	1.778	1.270	1.778	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	Jun 3 /17 06:02:36	Manual	0.635	1.778	0.889	1.778	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	Jun 4 /17 06:02:37	Manual	0.889	2.413	1.143	2.609	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	Jun 4 /17 13:29:16	Vert	0.889	2.413	1.143	2.609	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	Jun 4 /17 13:32:35	Manual	0.889	2.794	0.889	2.910	DND Barracks, Rankin Inlet, Nunavut
W	BE15860	Jun 4 /17 17:58:17	Vert	0.889	2.794	0.889	2.910	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	Jun 4 /17 18:01:33	Manual	0.254	0.381	0.254	0.402	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	Jun 5 /17 06:02:34	Manual	0.762	1.397	0.889	1.540	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	Jun 6 /17 06:02:36	Manual	0.635	0.889	0.635	1.040	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	Jun 7 /17 06:02:38	Manual	0.635	1.143	0.635	1.314	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	Jun 8 /17 06:02:36	Manual	0.381	1.016	0.381	1.085	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	Jun 9 /17 06:02:43	Manual	1.143	1.651	0.635	1.901	DND Barracks, Rankin Inlet, Nunavut

Rankin Inlet Laydown Yard/Tank Farm
M7704A - Nuna Logistics
April 25, 2017 to June 15, 2017

Event Report: Event List - z:\7. monitoring data\archived seismo readings\m77xx\m7704a - nunalogistics - rankin

Type	Serial No.	Date/Time	Trigger	Tran Peak (mm/s)	Vert Peak (mm/s)	Long Peak (mm/s)	PVS1 (mm/s)	Description
H	BE15860	Jun 10 /17 06:02:36	Manual	0.381	0.508	0.254	0.582	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	Jun 11 /17 06:02:37	Manual	0.254	0.635	0.381	0.696	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	Jun 12 /17 06:02:39	Manual	0.381	0.762	0.381	0.773	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	Jun 13 /17 06:02:37	Manual	0.381	0.889	0.381	0.933	DND Barracks, Rankin Inlet, Nunavut
H	BE15860	Jun 15 /17 06:55:13	Manual	0.254	0.254	0.254	0.440	DND Barracks, Rankin Inlet, Nunavut

APPENDIX R

Inspection Report – Quality Control Final Report for Geomembrane Installation

RANKIN INLET TANK FARM
AGNICO EAGLE MINES LIMITED
Rankin Inlet, Nunavut
Texel Geosol Project No. C-15152

QUALITY CONTROL FINAL REPORT BY TEXEL GEOSOL INC.

Prepared for:

NUNA KIVALLIQ EARTHWORKS INC

By:

Texel GEOSOL

December, 2017

RANKIN INLET TANK FARM
AGNICO EAGLE MINES LIMITED
Rankin Inlet, Nunavut
Texel Geosol Project No. C-15152

QUALITY CONTROL FINAL REPORT BY TEXEL GEOSOL INC.

Prepared for:

NUNA KIVALLIQ EARTHWORKS INC
NUNA SERVICES LTD

9839-31 Avenue
Edmonton, Alberta
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By:

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1300, 2e Rue, Parc industriel
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December, 2017

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1. INTRODUCTION

The following report was prepared by Texel Geosol, for Nuna Kivalliq Earthworks Inc.

This report contains a description as well as a certification of all work conducted by Texel Geosol, installer of the geosynthetics. It also contains the record drawing of the geomembrane installation for the Rankin Inlet tank farm. All installation work conducted on the geosynthetics took place between July 14 and October 6, 2017.

2. HUMAN RESOURCES

The following list identifies the key personnel involved with the physical realization of this project

TEXEL GEOSOL INC. (Geosynthetic Installer)

- Mr. François Thivierge, Construction and project Manager
- Mr. Jacques St-Gelais, Operation Manager
- Mr. Eric Black and Simon Jodoin, Site Foreman
- Mr. Michael Gilbert and Anthony Michon-Duquette, Field QC Inspector
- Mr. Simon-Carl Marcoux, Kléber Nault, Olivier Belval, Phillipe Allie and David Beaulieu, Technicians

NUNA KIVALLIQ EARTHWORKS INC (General Contractor - Client)

- Mr. Matt Gallant, Project Manager

AGNICO EAGLE CONSTRUCTION (Quality Assurance)

3. GEOMEMBRANE INSTALLATION

This section includes a description of the work and the installation procedures used during the deployment of the geomembrane. Also, the construction quality control procedures are detailed in this section

3.1. Description of the work

The scope of the installation was to completely cover the Rankin Inlet Tank Farm with a geosynthetic lining system. Texel Geosol installed approximately 15959 sm of 60 mil HDPE textured geomembrane and 805 sm of 60 mil HDPE smooth . All the installation, seaming and repair procedures were conducted according to the project plans and specifications, and manufacturer's recommendations.

3.2. Installation Procedures

The geomembrane rolls were later deployed and installed by Texel Geosol as prescribed in the specifications. Panels were placed to minimize seams across the side slope and the tie-in seams. The panels were overlapped about 125 to 150 mm, allowing adequate double fusion welding and leaving enough material to perform peel and shear tests on seam samples (see section 3.3.2.1 for a description of these tests).

All seams between panels were made using an automated polymer fusion process, the fusion being obtained through a double hot wedge. These parallel welds create an air channel which allow air-pressure testing of the continuity of the seam (see Fig. 1).

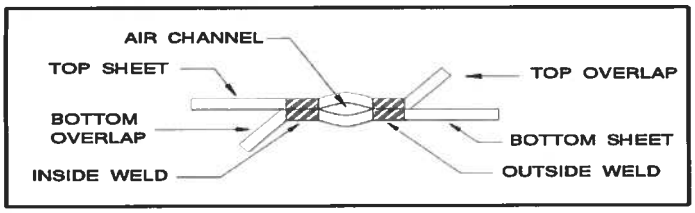


***Figure 1* - Double -Track Geomembrane Weld**

In restrictive areas where this process could not be adequately applied, such as corners, repair work and pipe penetrations, a manual extrusion fillet welding was employed (see Fig. 2).

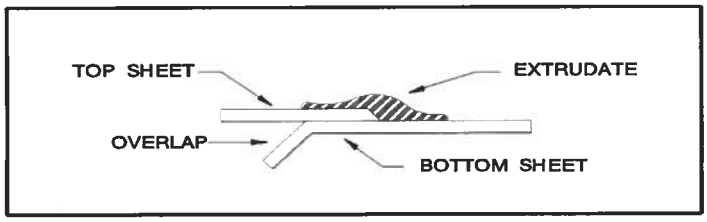


***Figure 2* - Fillet-Extruded Geomembrane Weld**

3.3. Geomembrane quality control

3.3.1. On-site geomembrane installation

3.3.1.1 Welding trial tests

Trial tests were performed prior to any on-site seaming in order to quantify the calibration of the welding equipment. On each sample, four peel tests and one shear tests were performed. A peel adhesion test is conducted by submitting a one inch-wide seam specimen to a tensile effort on a calibrated, portable tensiometer and trying to "peel", or open the seam (see Fig. 3). A shear strength test is similar, but the tension is applied in the plane of the seam (see Fig. 4). The peel test gives an indication of the quality of the seam while the shear test demonstrates the actual behavior of the seam in service.

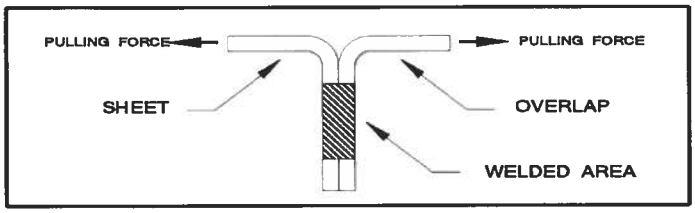


Figure 3 **- Peel Adhesion Test**

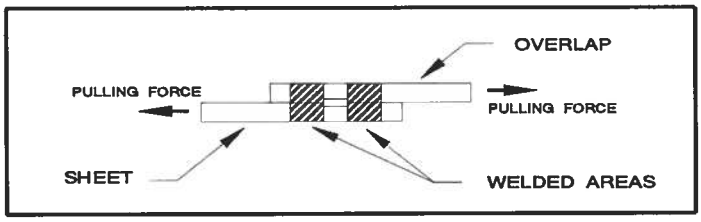


Figure 4 **- Shear Strength Test**

For each trial test, the QC Inspector recorded the date, time, ambient and operating temperatures, equipment number, speed setting, operator's initials, peel and shear values and corresponding type of break. The only type of break acceptable is designated as "FTB", as per the US-EPA classification for types of breaks, available in appendix III. The seams were made only after a satisfactory trial test had been obtained. All the results of these tests are also included in appendix I.

3.3.1.2 On-site non-destructive testing

The continuity of all seams (100%) was verified by non-destructive methods. These methods include the air-pressure test and the vacuum-box test. Any seam that failed one of these tests was rebuilt or repaired until a satisfactory result was obtained. All the results of these tests are included in Appendix I of this report.

a) Air-Pressure Testing

Air-pressure testing was employed as the primary test method. This non-destructive test method consists of injecting air at a predetermined pressure in the center air channel of fusion-welded seams (see Fig. 5). If the seam is continuous there will be very little or no drop of pressure. If a leak is present within the area under pressure, it is located and repaired. This type of non-destructive test is faster than the vacuum-box test, less observer-dependent and represents a supplementary mechanical resistance test since the geomembrane sheets are pulled away from each other by the air pressure in the channel.

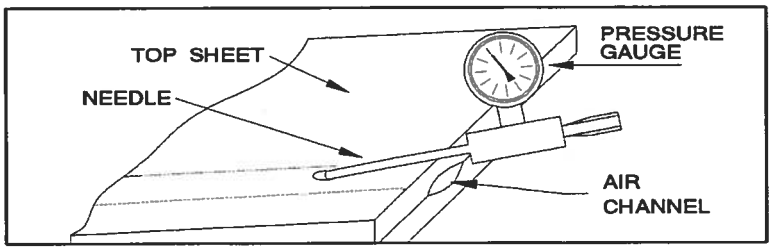


Figure 5 **- Air-Pressure Test**

b) Vacuum-box test

Wherever the air-pressure test could not be used, the vacuum-box test was employed. In this test, a film of soapy water is sprinkled over the area to be tested. A box fitted with a transparent upper cover and a neoprene lower rim is placed over that same area and connected to a vacuum pump; a negative pressure of 5 psi is then applied (see Fig. 6). If there is a puncture or discontinuous seam within this area, bubbles will appear and be detected by the observer.

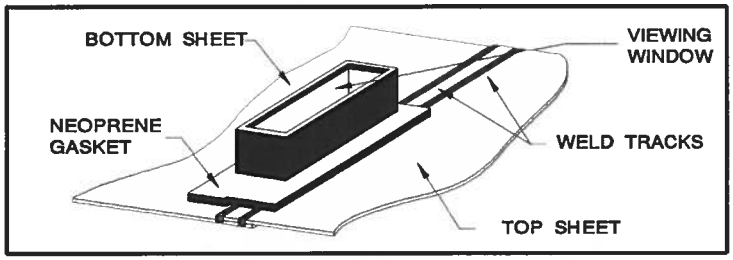


***Figure 6* - Vacuum-Box Test**

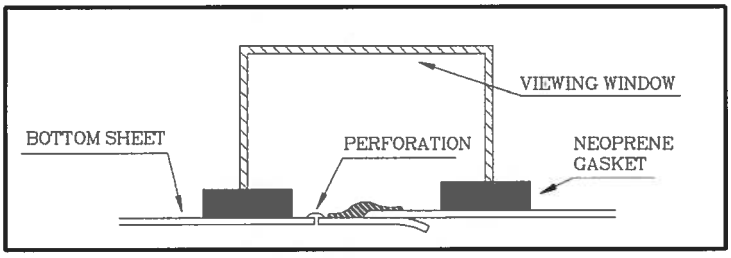


***Figure 7* - Vacuum-Box Test**

3.3.1.3 On-site destructive tests

Finally, a destructive testing program was applied, where seam samples taken from the installed geomembrane were tested for peel adhesion and shear strength on a calibrated, portable tensiometer. On each sample, four peel tests and one shear tests were performed. All the results from these tests are included in Appendix I of this report.

3.4. Repair Procedures

All materials were visually inspected for blemishes, punctures and other defects or damages that may have occurred during transport or panel placement. Any defect or damage was repaired as per the procedures described in this section.

Demobilization was not authorized until Texel Geosol, Nuna Kivalliq Earthworks Inc and Agnico Eagle Construction completed a last visual inspection of the installation work. Any defect revealed by any step of the Quality Control Program was repaired and verified according to the prescribed procedures:

- All pockmarks, pinholes, T-seams, etc., smaller than the tip of the extruder were covered with an extrusion bead;
- All punctures, holes, tears, etc., wider than the tip of the extruder were repaired with extrusion-welded patches;
- Any seam revealed as defective by the CQC or CQA Programs was entirely rebuilt through a fusion and/or extrusion seaming process.

Prior to any fillet extrusion welding, the geomembrane was buffed to insure better adhesion of the extruded material. All repairs were visually inspected and verified by a non-destructive testing method, as described in section 3.3.2.2.

3.5. Record Drawing

The record drawing of the geomembrane installation, showing all panels, panel identification, pipe penetrations, repairs and destructive test locations, is included in Appendix IV of this report.

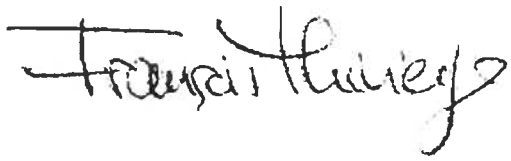
4. GEOTEXTILE QUALITY CONTROL

Approximately 33 527 sm of non-woven geotextile was installed by Texel Geosol according to the project plans and specifications. The geotextile panels were overlapped approximately 100 to 150 mm and thermally bonding (hot air or wedge) or sewing in order to ensure the continuity of the cushion layer.

Any holes or tears in the geotextile were repaired according to the project specifications. All geotextile materials were installed by Texel Geosol.

5. CERTIFICATION

Texel Geosol certifies having installed all geosynthetic materials according to the project plans and specifications provided by the consultant Tetra Tech, for Nuna Kivalliq Earthworks Inc. All installation work conducted by Texel Geosol meets or exceeds the standards of the geosynthetic industry.



12-07-17

François Thivierge, P.Eng., MBA
Construction Director
TEXEL GEOSOL INC.

Date

(mm-dd-yy)

APPENDIX I

QUALITY CONTROL PROCEDURES CONDUCTED ON SITE BY TEXEL GEOSOL INC.

Texel
GEOSOL

Fusion Trial Tests
Calibration par Fusion

Project Name / Nom de Projet: **Rankin Inlet Tank Farm**

Project No. / No. de Projet: **C-15152**

QC Inspector / Inspecteur CQ: **Anthony Duquette-Michon**

Trial Test No. No. de Calibration	Date (mm/dd/yy)	Time Heure	Ambient Temp. Temp. Ambiante	Equipment No. No. Équipement	Equipment Temp. Temp. Équipement	Equipment Speed Vitesse Équipement	Peel Resistance Résistance Pelage "A" (ppi)	Peel Type of Break Type de Brisure	Peel Resistance Résistance Pelage "B" (ppi)	Peel Type of Break Type de Brisure	Shear Resistance Résist. Cisaillement (ppi)	Shear Type of Break Type de Brisure	Tech.-Welder Soudeur	Tensiometer No. No. Tensiomètre
F-1	07-18-17	09:45	13 °C	MD 007	860 °F	500	120	SE1	117	SE1	173	BRK	D.B	T-9709
"	"	"	"	"	"	"	142	SE1	120	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	132	SE1	119	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	121	SE1	122	SE1	N/A	N/A	"	"
F-2	07-16-17	08:30	17 °C	MD 007	860 °F	500	112	SE1	119	SE1	157	BRK	D.B	T-9709
"	"	"	"	"	"	"	119	SE1	120	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	119	SE1	121	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	112	SE1	118	SE1	N/A	N/A	"	"
F-3	07-16-17	08:30	17 °C	MD 007	860 °F	425	121	SE1	135	SE1	166	BRK	D.B	T-9709
"	"	"	"	"	"	"	131	SE1	128	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	139	SE1	133	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	132	SE1	130	SE1	N/A	N/A	"	"
F-4	09-12-17	16:15	-2 °C	MD 007	860 °F	350	135	SE1	139	SE1	186	BRK	K.N	T-9709
"	"	"	"	"	"	"	136	SE1	134	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	126	SE1	133	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	123	SE1	142	SE1	N/A	N/A	"	"
F-5	09-13-17	07:10	0 °C	MD 007	860 °F	350	141	SE1	150	SE1	200	BRK	K.N	T-9709
"	"	"	"	"	"	"	137	SE1	150	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	146	SE1	136	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	144	SE1	153	SE1	N/A	N/A	"	"
F-6	09-13-17	09:30	0 °C	M9858	750 °F	300	157	SE1	143	SE1	205	BRK	K.N	T-9709
"	"	"	"	"	"	"	156	SE1	142	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	170	SE1	156	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	155	SE1	149	SE1	N/A	N/A	"	"

Texel GEOSOL

Fusion Trial Tests
Calibration par Fusion

Project Name / Nom de Projet: **Rankin Inlet Tank Farm**

Project No. / No. de Projet: **C-15152**

QC Inspector / Inspecteur CQ: **Anthony Duquette-Michon**

Trial Test No. No. de Calibration	Date (mm/dd/yy)	Time Heure	Ambient Temp. Temp. Ambiante	Equipment No. No. Équipement	Equipment Temp. Temp. Équipement	Equipment Speed Vitesse Équipement	Peel Resistance Résistance Pelage "A" (ppi)	Peel Type of Break Type de Brisure	Peel Resistance Résistance Pelage "B" (ppi)	Peel Type of Break Type de Brisure	Shear Resistance Résist. Cisaillement (ppi)	Shear Type of Break Type de Brisure	Tech.-Welder Soudeur	Tensiometer No. No. Tensiomètre
F-7	09-13-17	13:30	2 °C	MD 007	860 °F	500	113	SE1	123	SE1	167	BRK	K.N	T-9709
"	"	"	"	"	"	"	113	SE1	124	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	118	SE1	126	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	124	SE1	130	SE1	N/A	N/A	"	"
F-8	09-14-17	07:15	-2 °C	MD 007	860 °F	450	121	SE1	138	SE1	194	BRK	K.N	T-9709
"	"	"	"	"	"	"	119	SE1	142	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	120	SE1	160	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	129	SE1	153	SE1	N/A	N/A	"	"
F-9	09-14-17	07:15	-2 °C	M9858	750 °F	300	133	SE1	131	SE1	208	BRK	K.N	T-9709
"	"	"	"	"	"	"	129	SE1	153	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	135	SE1	149	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	137	SE1	144	SE1	N/A	N/A	"	"
F-10	09-14-17	12:00	2 °C	MD 007	860 °F	450	120	SE1	122	SE1	169	BRK	K.N	T-9709
"	"	"	"	"	"	"	128	SE1	117	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	126	SE1	126	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	129	SE1	117	SE1	N/A	N/A	"	"
F-11	09-14-17	12:00	2 °C	M9858	750 °F	300	128	SE1	137	SE1	182	BRK	K.N	T-9709
"	"	"	"	"	"	"	137	SE1	141	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	141	SE1	137	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	152	SE1	138	SE1	N/A	N/A	"	"
F-12	09-15-17	06:45	0 °C	M9858	750 °F	300	145	SE1	157	SE1	216	BRK	K.N	T-9709
"	"	"	"	"	"	"	146	SE1	143	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	146	SE1	166	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	153	SE1	139	SE1	N/A	N/A	"	"

Texel
GEOSOL

Fusion Trial Tests
Calibration par Fusion

Project Name / Nom de Projet: **Rankin Inlet Tank Farm**

Project No. / No. de Projet: **C-15152**

QC Inspector / Inspecteur CQ: **Anthony Duquette-Michon**

Trial Test No. No. de Calibration	Date (mm/dd/yy)	Time Heure	Ambient Temp. Temp. Ambiante	Equipment No. No. Équipement	Equipment Temp. Temp. Équipement	Equipment Speed Vitesse Équipement	Peel Resistance Résistance Pelage "A" (ppi)	Peel Type of Break Type de Brisure	Peel Resistance Résistance Pelage "B" (ppi)	Peel Type of Break Type de Brisure	Shear Resistance Résist. Cisaillement (ppi)	Shear Type of Break Type de Brisure	Tech.-Welder Soudeur	Tensiometer No. No. Tensiomètre
F-13	09-15-17	11:40	2 °C	MD 007	860 °F	450	128	SE1	124	SE1	176	BRK	K.N	T-9709
"	"	"	"	"	"	"	142	SE1	128	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	125	SE1	129	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	144	SE1	130	SE1	N/A	N/A	"	"
F-14	09-17-17	16:00	5 °C	MD 007	860 °F	450	134	SE1	128	SE1	179	BRK	K.N	T-9709
"	"	"	"	"	"	"	134	SE1	116	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	136	SE1	133	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	120	SE1	138	SE1	N/A	N/A	"	"

Texel GEOSOL

Fusion Trial Tests
Calibration par Fusion

Project Name / Nom de Projet: **Rankin Inlet Tank Farm**

Project No. / No. de Projet: **C-15152**

QC Inspector / Inspecteur CQ: **Anthony Duquette-Michon**

Trial Test No. No. de Calibration	Date (mm/dd/yy)	Time Heure	Ambient Temp. Temp. Ambiante	Equipment No. No. Équipement	Equipment Temp. Temp. Équipement	Equipment Speed Vitesse Équipement	Peel Resistance Résistance Pelage "A" (ppi)	Peel Type of Break Type de Brisure	Peel Resistance Résistance Pelage "B" (ppi)	Peel Type of Break Type de Brisure	Shear Resistance Résist. Cisaillement (ppi)	Shear Type of Break Type de Brisure	Tech.-Welder Soudeur	Tensiometer No. No. Tensiomètre
F-15	09-18-17	07:00	4 °C	MD 007	860 °F	450	136	SE1	128	SE1	190	BRK	K.N	T-9709
"	"	"	"	"	"	"	130	SE1	126	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	130	SE1	135	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	131	SE1	129	SE1	N/A	N/A	"	"
F-16	09-18-17	08:15	4 °C	MD 007	860 °F	300	175	SE1	168	SE1	216	BRK	K.N	T-9709
"	"	"	"	"	"	"	187	SE1	185	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	174	SE1	176	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	187	SE1	184	SE1	N/A	N/A	"	"
F-17	09-18-17	12:00	4 °C	M9858	750 °F	300	147	SE1	166	SE1	202	BRK	K.N	T-9709
"	"	"	"	"	"	"	149	SE1	163	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	146	SE1	153	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	146	SE1	161	SE1	N/A	N/A	"	"
F-18	09-18-17	13:30	4 °C	MD 007	860 °F	300	153	SE1	166	SE1	197	BRK	K.N	T-9709
"	"	"	"	"	"	"	169	SE1	171	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	175	SE1	174	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	172	SE1	171	SE1	N/A	N/A	"	"

Texel GEOSOL

Fusion Trial Tests
Calibration par Fusion

Project Name / Nom de Projet: **Rankin Inlet Tank Farm**

Project No. / No. de Projet: **C-15152**

QC Inspector / Inspecteur CQ: **Anthony Duquette-Michon**

Trial Test No. No. de Calibration	Date (mm/dd/yy)	Time Heure	Ambient Temp. Temp. Ambiante	Equipment No. No. Équipement	Equipment Temp. Temp. Équipement	Equipment Speed Vitesse Équipement	Peel Resistance Résistance Pelage "A" (ppi)	Peel Type of Break Type de Brisure	Peel Resistance Résistance Pelage "B" (ppi)	Peel Type of Break Type de Brisure	Shear Resistance Résist. Cisaillement (ppi)	Shear Type of Break Type de Brisure	Tech.-Welder Soudeur	Tensiometer No. No. Tensiomètre
F-19	09-19-17	06:45	6 °C	MD 007	860 °F	450	118	SE1	126	SE1	184	BRK	K.N	T-9709
"	"	"	"	"	"	"	132	SE1	123	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	134	SE1	121	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	145	SE1	127	SE1	N/A	N/A	"	"
F-20	09-19-17	11:45	7 °C	MD 007	860 °F	450	121	SE1	140	SE1	172	BRK	K.N	T-9709
"	"	"	"	"	"	"	125	SE1	138	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	113	SE1	134	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	142	SE1	130	SE1	N/A	N/A	"	"
F-21	09-19-17	15:00	7 °C	MD 007	860 °F	450	188	SE1	179	SE1	181	BRK	K.N	T-9709
"	"	"	"	"	"	"	168	SE1	172	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	172	SE1	165	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	170	SE1	177	SE1	N/A	N/A	"	"
F-22	09-20-17	07:00	3 °C	MD 007	860 °F	300	146	SE1	137	SE1	177	BRK	K.N	T-9709
"	"	"	"	"	"	"	148	SE1	129	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	146	SE1	124	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	149	SE1	130	SE1	N/A	N/A	"	"
F-23	09-20-17	13:30	7 °C	MD 007	860 °F	550	125	SE1	131	SE1	180	BRK	K.N	T-9709
"	"	"	"	"	"	"	127	SE1	134	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	132	SE1	134	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	120	SE1	132	SE1	N/A	N/A	"	"

Texel GEOSOL

Fusion Trial Tests
Calibration par Fusion

Project Name / Nom de Projet: **Rankin Inlet Tank Farm**

Project No. / No. de Projet: **C-15152**

QC Inspector / Inspecteur CQ: **Anthony Duquette-Michon**

Trial Test No. No. de Calibration	Date (mm/dd/yy)	Time Heure	Ambient Temp. Temp. Ambiante	Equipment No. No. Équipement	Equipment Temp. Temp. Équipement	Equipment Speed Vitesse Équipement	Peel Resistance Résistance Pelage "A" (ppi)	Peel Type of Break Type de Brisure	Peel Resistance Résistance Pelage "B" (ppi)	Peel Type of Break Type de Brisure	Shear Resistance Résist. Cisaillement (ppi)	Shear Type of Break Type de Brisure	Tech.-Welder Soudeur	Tensiometer No. No. Tensiomètre
F-24	09-20-17	16:00	6 °C	MD 007	860 °F	300	160	SE1	169	SE1	200	BRK	K.N	T-9709
"	"	"	"	"	"	"	172	SE1	174	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	171	SE1	170	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	184	SE1	177	SE1	N/A	N/A	"	"
F-25	09-22-17	14:20	6 °C	MD 007	860 °F	550	142	SE1	134	SE1	182	BRK	K.N	T-9709
"	"	"	"	"	"	"	137	SE1	134	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	137	SE1	137	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	129	SE1	125	SE1	N/A	N/A	"	"
F-26	09-23-17	07:30	-2 °C	MD 007	860 °F	550	152	SE1	140	SE1	211	BRK	K.N	T-9709
"	"	"	"	"	"	"	160	SE1	143	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	153	SE1	152	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	148	SE1	140	SE1	N/A	N/A	"	"
F-27	09-23-17	07:30	-2 °C	MD 007	860 °F	350	136	SE1	186	SE1	214	BRK	K.N	T-9709
"	"	"	"	"	"	"	127	SE1	182	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	127	SE1	182	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	133	SE1	187	SE1	N/A	N/A	"	"
F-28	09-23-17	07:30	-2 °C	MD 007	860 °F	300	161	SE1	175	SE1	211	BRK	K.N	T-9709
"	"	"	"	"	"	"	188	SE1	186	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	174	SE1	191	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	190	SE1	179	SE1	N/A	N/A	"	"
F-29	09-23-17	13:00	5 °C	MD 007	860 °F	600	129	SE1	131	SE1	175	BRK	K.N	T-9709
"	"	"	"	"	"	"	124	SE1	128	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	104	SE1	119	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	128	SE1	130	SE1	N/A	N/A	"	"

Texel
GEOSOL

Fusion Trial Tests
Calibration par Fusion

Project Name / Nom de Projet: **Rankin Inlet Tank Farm**

Project No. / No. de Projet: **C-15152**

QC Inspector / Inspecteur CQ: **Anthony Duquette-Michon**

Trial Test No. No. de Calibration	Date (mm/dd/yy)	Time Heure	Ambient Temp. Temp. Ambiante	Equipment No. No. Équipement	Equipment Temp. Temp. Équipement	Equipment Speed Vitesse Équipement	Peel Resistance Résistance Pelage "A" (ppi)	Peel Type of Break Type de Brisure	Peel Resistance Résistance Pelage "B" (ppi)	Peel Type of Break Type de Brisure	Shear Resistance Résist. Cisaillement (ppi)	Shear Type of Break Type de Brisure	Tech.-Welder Soudeur	Tensiometer No. No. Tensiomètre
F-30	09-23-17	14:30	5 °C	MD 007	860 °F	300	129	SE1	146	SE1	161	BRK	K.N	T-9709
"	"	"	"	"	"	"	141	SE1	137	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	135	SE1	146	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	143	SE1	145	SE1	N/A	N/A	"	"
F-31	09-24-17	07:00	0 °C	MD 007	860 °F	350	172	SE1	166	SE1	206	BRK	K.N	T-9709
"	"	"	"	"	"	"	125	SE1	168	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	153	SE1	169	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	145	SE1	151	SE1	N/A	N/A	"	"
F-32	09-24-17	07:00	0 °C	MD 007	860 °F	600	141	SE1	143	SE1	204	BRK	K.N	T-9709
"	"	"	"	"	"	"	141	SE1	149	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	141	SE1	157	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	142	SE1	147	SE1	N/A	N/A	"	"
F-33	09-24-17	07:00	0 °C	MD 007	860 °F	300	173	SE1	167	SE1	205	BRK	K.N	T-9709
"	"	"	"	"	"	"	171	SE1	165	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	162	SE1	172	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	173	SE1	173	SE1	N/A	N/A	"	"
F-34	09-24-17	11:45	1 °C	MD 007	860 °F	600	134	SE1	130	SE1	190	BRK	K.N	T-9709
"	"	"	"	"	"	"	131	SE1	143	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	132	SE1	142	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	145	SE1	135	SE1	N/A	N/A	"	"

Texel GEOSOL

Fusion Trial Tests
Calibration par Fusion

Project Name / Nom de Projet: **Rankin Inlet Tank Farm**

Project No. / No. de Projet: **C-15152**

QC Inspector / Inspecteur CQ: **Anthony Duquette-Michon**

Trial Test No. No. de Calibration	Date (mm/dd/yy)	Time Heure	Ambient Temp. Temp. Ambiante	Equipment No. No. Équipement	Equipment Temp. Temp. Équipement	Equipment Speed Vitesse Équipement	Peel Resistance Résistance Pelage "A" (ppi)	Peel Type of Break Type de Brisure	Peel Resistance Résistance Pelage "B" (ppi)	Peel Type of Break Type de Brisure	Shear Resistance Résist. Cisaillement (ppi)	Shear Type of Break Type de Brisure	Tech.-Welder Soudeur	Tensiometer No. No. Tensiomètre
F-35	09-24-17	11:45	1 °C	MD 007	860 °F	350	175	SE1	166	SE1	200	BRK	K.N	T-9709
"	"	"	"	"	"	"	175	SE1	169	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	177	SE1	178	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	177	SE1	174	SE1	N/A	N/A	"	"
F-36	09-25-17	09:30	5 °C	MD 007	860 °F	600	128	SE1	123	SE1	183	BRK	K.N	T-9709
"	"	"	"	"	"	"	130	SE1	135	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	137	SE1	133	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	132	SE1	128	SE1	N/A	N/A	"	"
F-37	09-25-17	09:30	5 °C	MD 007	860 °F	350	117	SE1	122	SE1	194	BRK	K.N	T-9709
"	"	"	"	"	"	"	121	SE1	125	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	117	SE1	126	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	117	SE1	168	SE1	N/A	N/A	"	"
F-38	09-25-17	09:30	5 °C	MD 007	860 °F	300	170	SE1	168	SE1	197	BRK	K.N	T-9709
"	"	"	"	"	"	"	164	SE1	160	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	163	SE1	164	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	173	SE1	165	SE1	N/A	N/A	"	"
F-39	09-27-17	12:00	-2 °C	MD 007	860 °F	600	134	SE1	133	SE1	182	BRK	K.N	T-9709
"	"	"	"	"	"	"	132	SE1	127	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	132	SE1	135	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	136	SE1	131	SE1	N/A	N/A	"	"

Texel GEOSOL

Fusion Trial Tests
Calibration par Fusion

Project Name / Nom de Projet: **Rankin Inlet Tank Farm**

Project No. / No. de Projet: **C-15152**

QC Inspector / Inspecteur CQ: **Anthony Duquette-Michon**

Trial Test No. No. de Calibration	Date (mm/dd/yy)	Time Heure	Ambient Temp. Temp. Ambiante	Equipment No. No. Équipement	Equipment Temp. Temp. Équipement	Equipment Speed Vitesse Équipement	Peel Resistance Résistance Pelage "A" (ppi)	Peel Type of Break Type de Brisure	Peel Resistance Résistance Pelage "B" (ppi)	Peel Type of Break Type de Brisure	Shear Resistance Résist. Cisaillement (ppi)	Shear Type of Break Type de Brisure	Tech.-Welder Soudeur	Tensiometer No. No. Tensiomètre
F-40	09-27-17	12:00	-2 °C	MD 007	860 °F	350	127	SE1	123	SE1	178	BRK	K.N	T-9709
"	"	"	"	"	"	"	124	SE1	127	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	129	SE1	129	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	127	SE1	132	SE1	N/A	N/A	"	"
F-41	09-27-17	12:00	-2 °C	MD 007	860 °F	300	165	SE1	166	SE1	203	BRK	K.N	T-9709
"	"	"	"	"	"	"	171	SE1	165	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	153	SE1	160	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	157	SE1	166	SE1	N/A	N/A	"	"
F-42	10-04-17	07:00	-3 °C	MD 007	860 °F	500	148	SE1	136	SE1	196	BRK	K.N	T-9709
"	"	"	"	"	"	"	169	SE1	168	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	146	SE1	142	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	169	SE1	146	SE1	N/A	N/A	"	"
F-43	10-06-17	10:45	-3 °C	MD 007	860 °F	500	121	SE1	124	SE1	171	BRK	K.N	T-9709
"	"	"	"	"	"	"	127	SE1	120	SE1	N/A	N/A	"	"
"	"	"	"	"	"	"	127	SE1	118	SE1	N/A	N/A	"	"
"	"	"	"	"	"		114	SE1	122	SE1	N/A	N/A	"	"

Texel GEOSOL

Extrusion Trial Tests
Calibration par Extrusion

Project Name / Nom de Projet: **Rankin Inlet Tank Farm**

Project No. / No. de Projet: **C-15152**

QC Inspector / Inspecteur CQ: **Anthony Duquette-Michon**

Trial Test No. No. de Calibration	Date (mm/dd/yy)	Time Heure	Ambient Temp. Temp. Ambiante	Equipment No. No. Équipement	Equipment Temp. Temp. Équipement	Pre-Heat Temp. Temp. Pré-Chauf.	Peel Resistance Résistance Pelage (ppi)	Peel Type of Break Type de Brisure	Shear Resistance Résist. Cisaillement (ppi)	Shear Type of Break Type de Brisure	Tech.-Welder Soudeur	Tensiometer No. No. Tensiomètre
E-1	07-15-17	13:00	16 °C	EX-E	250 °C	250 °C	124	SE3	161	BRK	E.B	T-9709
"	"	"	"	"	"	"	133	SE3	N/A	N/A	"	"
"	"	"	"	"	"	"	128	SE3	N/A	N/A	"	"
"	"	"	"	"	"	"	128	SE3	N/A	N/A	"	"
E-2	07-16-17	12:30	20 °C	EX-E	250 °C	250 °C	119	SE3	157	BRK	E.B	T-9709
"	"	"	"	"	"	"	119	SE3	N/A	N/A	"	"
"	"	"	"	"	"	"	119	SE3	N/A	N/A	"	"
"	"	"	"	"	"	"	116	SE3	N/A	N/A	"	"
E-3	09-13-17	11:00	0 °C	EX-E	260 °C	260 °C	160	SE3	176	BRK	S.M	T-9709
"	"	"	"	"	"	"	166	SE3	N/A	N/A	"	"
"	"	"	"	"	"	"	145	SE3	N/A	N/A	"	"
"	"	"	"	"	"	"	149	SE3	N/A	N/A	"	"
E-4	09-14-17	09:50	0 °C	EX-E	260 °C	260 °C	113	SE3	187	BRK	S.M	T-9709
"	"	"	"	"	"	"	121	SE3	N/A	N/A	"	"
"	"	"	"	"	"	"	140	SE3	N/A	N/A	"	"
"	"	"	"	"	"	"	148	SE3	N/A	N/A	"	"
E-5	09-15-17	07:00	0 °C	EX-E	260 °C	260 °C	92	SE3	199	BRK	K.N	T-9709
"	"	"	"	"	"	"	122	SE3	N/A	N/A	"	"
"	"	"	"	"	"	"	110	SE3	N/A	N/A	"	"
"	"	"	"	"	"	"	107	SE3	N/A	N/A	"	"

Texel GEOSOL

Extrusion Trial Tests
Calibration par Extrusion

Project Name / Nom de Projet: **Rankin Inlet Tank Farm**

Project No. / No. de Projet: **C-15152**

QC Inspector / Inspecteur CQ: **Anthony Duquette-Michon**

Trial Test No. No. de Calibration	Date (mm/dd/yy)	Time Heure	Ambient Temp. Temp. Ambiante	Equipment No. No. Équipement	Equipment Temp. Temp. Équipement	Pre-Heat Temp. Temp. Pré-Chauf.	Peel Resistance Résistance Pelage (ppi)	Peel Type of Break Type de Brisure	Shear Resistance Résist. Cisaillement (ppi)	Shear Type of Break Type de Brisure	Tech.-Welder Soudeur	Tensiometer No. No. Tensiomètre
E-6	09-18-17	13:30	4 °C	EX-E	260 °C	260 °C	152	SE3	186	BRK	S.M	T-9709
"	"	"	"	"	"	"	160	SE3	N/A	N/A	"	"
"	"	"	"	"	"	"	169	SE3	N/A	N/A	"	"
"	"	"	"	"	"	"	155	SE3	N/A	N/A	"	"
E-7	09-20-17	07:00	3 °C	EX-E	260 °C	260 °C	130	SE3	194	BRK	S.M	T-9709
"	"	"	"	"	"	"	129	SE3	N/A	N/A	"	"
"	"	"	"	"	"	"	122	SE3	N/A	N/A	"	"
"	"	"	"	"	"	"	131	SE3	N/A	N/A	"	"
E-8	09-20-17	16:00	6 °C	EX-E	260 °C	260 °C	132	SE3	185	BRK	S.M	T-9709
"	"	"	"	"	"	"	120	SE3	N/A	N/A	"	"
"	"	"	"	"	"	"	133	SE3	N/A	N/A	"	"
"	"	"	"	"	"	"	130	SE3	N/A	N/A	"	"
E-9	09-23-17	10:00	2 °C	EX-E	260 °C	260 °C	107	SE3	198	BRK	S.M	T-9709
"	"	"	"	"	"	"	131	SE3	N/A	N/A	"	"
"	"	"	"	"	"	"	137	SE3	N/A	N/A	"	"
"	"	"	"	"	"	"	142	SE3	N/A	N/A	"	"
E-10	09-24-17	14:00	5 °C	EX-E	260 °C	260 °C	92	SE3	188	BRK	S.M	T-9709
"	"	"	"	"	"	"	98	SE3	N/A	N/A	"	"
"	"	"	"	"	"	"	95	SE3	N/A	N/A	"	"
"	"	"	"	"	"	"	99	SE3	N/A	N/A	"	"

Texel GEOSOL

Extrusion Trial Tests
Calibration par Extrusion

Project Name / Nom de Projet: **Rankin Inlet Tank Farm**

Project No. / No. de Projet: **C-15152**

QC Inspector / Inspecteur CQ: **Anthony Duquette-Michon**

Trial Test No. No. de Calibration	Date (mm/dd/yy)	Time Heure	Ambient Temp. Temp. Ambiante	Equipment No. No. Équipement	Equipment Temp. Temp. Équipement	Pre-Heat Temp. Temp. Pré-Chauf.	Peel Resistance Résistance Pelage (ppi)	Peel Type of Break Type de Brisure	Shear Resistance Résist. Cisaillement (ppi)	Shear Type of Break Type de Brisure	Tech.-Welder Soudeur	Tensiometer No. No. Tensiomètre
E-11	09-25-17	15:45	7 °C	EX-E	255 °C	255 °C	100	SE3	172	BRK	S.M	T-9709
"	"	"	"	"	"	"	116	SE3	N/A	N/A	"	"
"	"	"	"	"	"	"	106	SE3	N/A	N/A	"	"
"	"	"	"	"	"	"	93	SE3	N/A	N/A	"	"
E-12	09-27-17	16:40	3 °C	EX-E	255 °C	255 °C	154	SE3	194	BRK	S.M	T-9709
"	"	"	"	"	"	"	108	SE3	N/A	N/A	"	"
"	"	"	"	"	"	"	157	SE3	N/A	N/A	"	"
"	"	"	"	"	"	"	121	SE3	N/A	N/A	"	"
E-13	10-03-17	10:00	-2 °C	EX-E	275 °C	275 °C	93	SE3	192	BRK	S.M	T-9709
"	"	"	"	"	"	"	120	SE3	N/A	N/A	"	"
"	"	"	"	"	"	"	127	SE3	N/A	N/A	"	"
"	"	"	"	"	"	"	123	SE3	N/A	N/A	"	"
E-14	10-04-17	10:45	-3 °C	EX-E	280 °C	280 °C	118	SE3	208	BRK	S.M	T-9709
"	"	"	"	"	"	"	88	SE3	N/A	N/A	"	"
"	"	"	"	"	"	"	109	SE3	N/A	N/A	"	"
"	"	"	"	"	"	"	120	SE3	N/A	N/A	"	"
E-15	10-06-17	13:40	-2 °C	EX-E	280 °C	285 °C	112	SE3	197	BRK	P.A	T-9709
"	"	"	"	"	"	"	121	SE3	N/A	N/A	"	"
"	"	"	"	"	"	"	118	SE3	N/A	N/A	"	"
"	"	"	"	"	"	"	120	SE3	N/A	N/A	"	"

Texel GEOSOL

Seaming Procedures
Procédures de Soudures

Project Name / Nom de Projet: **Rankin Inlet Tank Farm**

Project No. / No. de Projet: **C-15152**

QC Inspector / Inspecteur CQ: **Anthony Duquette-Michon**

Seaming Procedures / Procédures de Soudures						Non-Destructive Testing / Essai Non-Destructif							
Seam No. No. de Soudure	Date of Seaming Date de Soudure (mm/dd/yy)	Time of Seaming Heure de Soudure	Seam Length Longueur Soudure (m)	Trial Test No. No. Calibration	Technician-Welder Soudeur	Test Date Date de l'essai (mm/dd/yy)	Time Heure	Air-Pressure Pressurisation	Vacuum Box Boîte à Vide	Starting Pressure Pression Départ (psi)	Ending Pressure Pression Fin (psi)	Testing Details/Location Détails de l'essai/Localisation	Approved (Yes/No) Approuvé (Oui/Non)
1-2	07-15-17	10:00	38.9	F-1	D.B	07-15-17	10:22	X	-	31	31	Full seam	O
2-3	07-15-17	10:18	39	F-1	D.B	07-15-17	10:38	X	-	31	31	Full seam	O
3-4	07-15-17	10:40	39	F-1	D.B	07-15-17	11:40	X	-	30	30	Full seam	O
4-5	07-15-17	12:05	39.6	F-1	D.B	07-15-17	12:42	X	-	31	31	Full seam	O
5-6	07-15-17	12:40	39.4	F-1	D.B	07-15-17	13:02	X	-	31	31	Full seam	O
8-9	07-16-17	08:50	6.65	F-3	D.B	07-16-17	09:25	X	-	28	28	Full seam	O
9-10	07-16-17	09:39	6.65	F-3	D.B	07-16-17	09:46	X	-	31	30	Full seam	O
7-8	07-16-17	09:52	31.9	F-2	D.B	07-16-17	10:13	X	-	30	30	Full seam	O
7-9	07-16-17	09:52	4.5	F-2	D.B	07-16-17	10:13	X	-	30	30	Full seam	O
7-10	07-16-17	09:52	12.8	F-2	D.B	07-16-17	10:13	X	-	30	30	Full seam	O
10-11	07-16-17	10:13	12.4	F-2	D.B	07-16-17	10:38	X	-	31	31	Full seam	O
9-11	07-16-17	10:13	4.5	F-2	D.B	07-16-17	10:38	X	-	31	31	Full seam	O
8-11	07-16-17	10:13	31.9	F-2	D.B	07-16-17	10:38	X	-	31	31	Full seam	O

Texel
GEOSOL

Seaming Procedures
Procédures de Soudures

Project Name / Nom de Projet: **Rankin Inlet Tank Farm**

Project No. / No. de Projet: **C-15152**

QC Inspector / Inspecteur CQ: **Anthony Duquette-Michon**

Seaming Procedures / Procédures de Soudures						Non-Destructive Testing / Essai Non-Destructif							
Seam No. No. de Soudure	Date of Seaming Date de Soudure (mm/dd/yy)	Time of Seaming Heure de Soudure	Seam Length Longueur Soudure (m)	Trial Test No. No. Calibration	Technician-Welder Soudeur	Test Date Date de l'essai (mm/dd/yy)	Time Heure	Air-Pressure Pressurisation	Vacuum Box Boîte à Vide	Starting Pressure Pression Départ (psi)	Ending Pressure Pression Fin (psi)	Testing Details/Location Détails de l'essai/Localisation	Approved (Yes/No) Approuvé (Oui/Non)
11-12	07-16-17	10:38	48.2	F-2	D.B	07-16-17	11:37	X	-	32	31	Full seam	O
12-13	07-16-17	11:39	49	F-2	D.B	07-16-17	12:08	X	-	31	30.5	Full seam	O
13-14	07-16-17	12:02	49.2	F-2	D.B	07-16-17	12:23	X	-	30	30	Full seam	O
14-15	07-16-17	12:25	49.2	F-2	D.B	07-16-17	12:45	X	-	32	31	Full seam	O
15-16	07-16-17	13:08	16.2	F-2	D.B	07-16-17	13:30	X	-	30	30	Full seam	O
15-17	07-16-17	13:08	16.8	F-2	D.B	07-16-17	13:30	X	-	30	30	Full seam	O
15-18	07-16-17	13:08	16.3	F-2	D.B	07-16-17	13:30	X	-	30	30	Full seam	O
16-17	07-16-17	12:45	2.1	F-3	D.B	07-16-17	12:56	X	-	27	26	Full seam	O
17-18	07-16-17	12:51	2.1	F-3	D.B	07-16-17	13:09	X	-	32	31	Full seam	O
19-20	09-12-17	16:35	16.7	F-4	K.N	09-12-17	16:52	X	-	30.5	30	Full seam	O
20-21	09-12-17	17:05	16.8	F-4	K.N	09-12-17	17:26	X	-	32	31	Full seam	O
21-22	09-13-17	07:20	16.5	F-5	K.N	09-13-17	07:33	X	-	31	30.5	Full seam	O
22-23	09-13-17	07:34	16.6	F-5	K.N	09-13-17	07:51	X	-	31	30.5	Full seam	O

Texel GEOSOL

Seaming Procedures
Procédures de Soudures

Project Name / Nom de Projet: **Rankin Inlet Tank Farm**

Project No. / No. de Projet: **C-15152**

QC Inspector / Inspecteur CQ: **Anthony Duquette-Michon**

Seaming Procedures / Procédures de Soudures						Non-Destructive Testing / Essai Non-Destructif							
Seam No. No. de Soudure	Date of Seaming Date de Soudure (mm/dd/yy)	Time of Seaming Heure de Soudure	Seam Length Longueur Soudure (m)	Trial Test No. No. Calibration	Technician-Welder Soudeur	Test Date Date de l'essai (mm/dd/yy)	Time Heure	Air-Pressure Pressurisation	Vacuum Box Boîte à Vide	Starting Pressure Pression Départ (psi)	Ending Pressure Pression Fin (psi)	Testing Details/Location Détails de l'essai/Localisation	Approved (Yes/No) Approuvé (Oui/Non)
23-24	09-13-17	07:52	15.8	F-5	K.N	09-13-17	08:04	X	-	30	29	Full seam	O
24-25	09-13-17	08:05	16.6	F-5	K.N	09-13-17	08:17	X	-	31	30	Full seam	O
25-26	09-13-17	08:16	16.6	F-5	K.N	09-13-17	08:29	X	-	31	30.5	Full seam	O
26-27	09-13-17	08:30	16.4	F-5	K.N	09-13-17	08:42	X	-	30.5	30	Full seam	O
1-20	09-13-17	09:40	0.9	F-6	K.N	09-13-17	AM	-	X	-	-	Full seam	O
1-21	09-13-17	09:40	5.8	F-6	K.N	09-13-17	10:33	X	-	30	30	Full seam	O
2-21	09-13-17	09:40	0.9	F-6	K.N	09-13-17	AM	-	X	-	-	Full seam	O
2-22	09-13-17	09:40	5.8	F-6	K.N	09-13-17	10:39	X	-	33	33	Full seam	O
3-22	09-13-17	09:40	0.9	F-6	K.N	09-13-17	10:39	X	-	33	33	Full seam	O
3-23	09-13-17	09:40	5.8	F-6	K.N	09-13-17	10:39	X	-	33	33	From North 0m to 4m	O
"	"	"	"	"	"	09-13-17	10:14	X	-	33	31	4m to 5.8m	O
4-23	09-13-17	09:40	0.9	F-6	K.N	09-13-17	10:14	X	-	33	31	Full seam	O
4-24	09-13-17	09:40	5.8	F-6	K.N	09-13-17	10:14	X	-	33	31	Full seam	O

Texel GEOSOL

Seaming Procedures
Procédures de Soudures

Project Name / Nom de Projet: **Rankin Inlet Tank Farm**

Project No. / No. de Projet: **C-15152**

QC Inspector / Inspecteur CQ: **Anthony Duquette-Michon**

Seaming Procedures / Procédures de Soudures						Non-Destructive Testing / Essai Non-Destructif							
Seam No. No. de Soudure	Date of Seaming Date de Soudure (mm/dd/yy)	Time of Seaming Heure de Soudure	Seam Length Longueur Soudure (m)	Trial Test No. No. Calibration	Technician-Welder Soudeur	Test Date Date de l'essai (mm/dd/yy)	Time Heure	Air-Pressure Pressurisation	Vacuum Box Boîte à Vide	Starting Pressure Pression Départ (psi)	Ending Pressure Pression Fin (psi)	Testing Details/Location Détails de l'essai/Localisation	Approved (Yes/No) Approuvé (Oui/Non)
5-24	09-13-17	09:40	0.9	F-6	K.N	09-13-17	10:14	X	-	33	31	Full seam	O
5-25	09-13-17	09:40	5.8	F-6	K.N	09-13-17	10:14	X	-	33	31	Full seam	O
6-25	09-13-17	09:40	0.9	F-6	K.N	09-13-17	10:11	X	-	30	30	Full seam	O
6-26	09-13-17	09:40	5.8	F-6	K.N	09-13-17	10:11	X	-	30	30	Full seam	O
27-28	09-13-17	14:00	15.7	F-7	K.N	09-13-17	08:42	X	-	31	30	Full seam	O
19-29	09-13-17	16:23	9.4	F-7	K.N	09-13-17	14:13	X	-	30	29	Full seam	O
30-31	09-13-17	16:30	5.2	F-7	K.N	09-13-17	16:31	X	-	31	31	Full seam	O
29-30	09-13-17	16:40	6.1	F-6	K.N	09-13-17	16:36	X	-	28	27	Full seam	O
29-31	09-13-17	16:40	3.2	F-6	K.N	09-13-17	17:11	X	-	28	27	Full seam	O
29-32	09-13-17	16:50	3.4	F-6	K.N	09-13-17	17:11	X	-	28	27	Full seam	O
31-32	09-13-17	16:55	2	F-6	K.N	09-13-17	16:57	X	-	27	26	Full seam	O
19-30	09-13-17	17:00	3.4	F-6	K.N	09-13-17	17:02	X	-	31	31	Full seam	O
30-35	09-14-17	12:20	10.8	F-10	K.N	09-14-17	12:34	X	-	31	30.5	Full seam	O

Texel GEOSOL

Seaming Procedures
Procédures de Soudures

Project Name / Nom de Projet: **Rankin Inlet Tank Farm**

Project No. / No. de Projet: **C-15152**

QC Inspector / Inspecteur CQ: **Anthony Duquette-Michon**

Seaming Procedures / Procédures de Soudures						Non-Destructive Testing / Essai Non-Destructif							
Seam No. No. de Soudure	Date of Seaming Date de Soudure (mm/dd/yy)	Time of Seaming Heure de Soudure	Seam Length Longueur Soudure (m)	Trial Test No. No. Calibration	Technician-Welder Soudeur	Test Date Date de l'essai (mm/dd/yy)	Time Heure	Air-Pressure Pressurisation	Vacuum Box Boîte à Vide	Starting Pressure Pression Départ (psi)	Ending Pressure Pression Fin (psi)	Testing Details/Location Détails de l'essai/Localisation	Approved (Yes/No) Approuvé (Oui/Non)
6-33	09-14-17	08:24	40.3	F-8	K.N	09-14-17	08:48	X	-	31.5	31.5	Full seam	O
33-34	09-14-17	09:00	40.3	F-8	K.N	09-14-17	09:41	X	-	31	31	Full seam	O
26-33	09-14-17	09:28	0.8	F-9	K.N	09-14-17	10:01	X	-	31	30	Full seam	O
27-33	09-14-17	09:28	5.9	F-9	K.N	09-14-17	10:01	X	-	31	30	Full seam	O
27-34	09-14-17	09:28	0.8	F-9	K.N	09-14-17	10:01	X	-	31	30	Full seam	O
28-34	09-14-17	09:28	5.9	F-9	K.N	09-14-17	10:01	X	-	31	30	Full seam	O
19-35	09-14-17	12:26	5.3	F-11	K.N	09-14-17	12:34	X	-	30.5	29	Full seam	O
35-36	09-14-17	12:34	10.1	F-10	K.N	09-14-17	12:50	X	-	32	31	Full seam	O
36-37	09-14-17	12:52	9.8	F-10	K.N	09-14-17	13:05	X	-	29.5	29.5	Full seam	O
37-38	09-14-17	13:02	9.6	F-10	K.N	09-14-17	13:14	X	-	30	30	Full seam	O
38-39	09-14-17	13:20	9.1	F-10	K.N	09-14-17	13:26	X	-	31	30	Full seam	O
39-40	09-14-17	13:35	9.5	F-10	K.N	09-14-17	13:47	X	-	30	30	Full seam	O
1-41	09-14-17	16:25	39.2	F-10	K.N	09-14-17	17:11	X	-	32	32	From West 0m to 8.4m	O

Texel
GEOSOL

Seaming Procedures
Procédures de Soudures

Project Name / Nom de Projet: **Rankin Inlet Tank Farm**

QC Inspector / Inspecteur CQ: **Anthony Duquette-Michon**

Project No. / No. de Projet: **C-15152**

Seaming Procedures / Procédures de Soudures						Non-Destructive Testing / Essai Non-Destructif							
Seam No. No. de Soudure	Date of Seaming Date de Soudure (mm/dd/yy)	Time of Seaming Heure de Soudure	Seam Length Longueur Soudure (m)	Trial Test No. No. Calibration	Technician-Welder Soudeur	Test Date Date de l'essai (mm/dd/yy)	Time Heure	Air-Pressure Pressurisation	Vacuum Box Boîte à Vide	Starting Pressure Pression Départ (psi)	Ending Pressure Pression Fin (psi)	Testing Details/Location Détails de l'essai/Localisation	Approved (Yes/No) Approuvé (Oui/Non)
"	"	"	"	"	"	09-14-17	17:13	X	-	31	30	8.4m to 39.2m	O
41-42	09-14-17	17:03	39.3	F-10	K.N	09-15-17	06:41	X	-	32	32	Full seam	O
20-41	09-15-17	07:05	5.9	F-12	K.N	09-15-17	07:29	X	-	32	32	Full seam	O
19-41	09-15-17	07:05	0.8	F-12	K.N	09-15-17	07:29	X	-	32	32	Full seam	O
19-42	09-15-17	07:05	5.9	F-12	K.N	09-15-17	07:29	X	-	32	32	Full seam	O
35-42	09-15-17	07:20	1.9	F-12	K.N	09-15-17	08:17	X	-	28	27	Full seam	O
36-42	09-15-17	07:20	6.65	F-12	K.N	09-15-17	08:17	X	-	28	27	Full seam	O
37-42	09-15-17	07:20	6.65	F-12	K.N	09-15-17	08:17	X	-	28	27	Full seam	O
38-42	09-15-17	07:20	6.65	F-12	K.N	09-15-17	08:17	X	-	28	27	Full seam	O
39-42	09-15-17	07:20	6.65	F-12	K.N	09-15-17	08:17	X	-	28	27	Full seam	O
40-42	09-15-17	07:20	6.65	F-12	K.N	09-15-17	08:17	X	-	28	27	Full seam	O
40-43	09-15-17	12:00	9.6	F-13	K.N	09-15-17	12:06	X	-	31	30	Full seam	O
43-44	09-15-17	12:07	11.2	F-13	K.N	09-15-17	12:15	X	-	31	30	Full seam	O

Texel GEOSOL

Seaming Procedures
Procédures de Soudures

Project Name / Nom de Projet: **Rankin Inlet Tank Farm**

QC Inspector / Inspecteur CQ: **Anthony Duquette-Michon**

Project No. / No. de Projet: **C-15152**

Seaming Procedures / Procédures de Soudures						Non-Destructive Testing / Essai Non-Destructif							
Seam No. No. de Soudure	Date of Seaming Date de Soudure (mm/dd/yy)	Time of Seaming Heure de Soudure	Seam Length Longueur Soudure (m)	Trial Test No. No. Calibration	Technician-Welder Soudeur	Test Date Date de l'essai (mm/dd/yy)	Time Heure	Air-Pressure Pressurisation	Vacuum Box Boîte à Vide	Starting Pressure Pression Départ (psi)	Ending Pressure Pression Fin (psi)	Testing Details/Location Détails de l'essai/Localisation	Approved (Yes/No) Approuvé (Oui/Non)
44-45	09-15-17	12:15	10.8	F-13	K.N	09-15-17	12:29	X	-	31	29	Full seam	O
45-46	09-15-17	12:22	10.6	F-13	K.N	09-15-17	12:34	X	-	29	29	Full seam	O
46-47	09-15-17	12:29	10.5	F-13	K.N	09-15-17	12:43	X	-	30.5	30	Full seam	O
47-48	09-15-17	14:17	10.5	F-13	K.N	09-15-17	14:22	X	-	30.5	29	Full seam	O
42-43	09-15-17	12:35	3.8	F-12	K.N	09-15-17	13:58	X	-	28	28	Full seam	O
48-49	09-15-17	14:30	10.7	F-13	K.N	09-15-17	14:38	X	-	27	26	Full seam	O
49-50	09-15-17	14:47	10.7	F-13	K.N	09-15-17	15:58	X	-	32	32	Full seam	O
50-51	09-17-17	16:12	10.7	F-14	K.N	09-17-17	16:21	X	-	30.5	30.5	Full seam	O
51-52	09-17-17	16:18	10.7	F-14	K.N	09-17-17	16:26	X	-	31	30	Full seam	O
52-53	09-17-17	16:25	11	F-14	K.N	09-17-17	16:36	X	-	31	30	Full seam	O
53-54	09-17-17	16:35	11	F-14	K.N	09-17-17	16:48	X	-	32	31	Full seam	O
54-55	09-17-17	16:45	11.2	F-14	K.N	09-17-17	16:56	X	-	29.5	28	Full seam	O
55-56	09-17-17	17:03	11.1	F-14	K.N	09-17-17	17:30	X	-	30	30	Full seam	O

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Seaming Procedures
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Project No. / No. de Projet: **C-15152**

QC Inspector / Inspecteur CQ: **Anthony Duquette-Michon**

Seaming Procedures / Procédures de Soudures						Non-Destructive Testing / Essai Non-Destructif							
Seam No. No. de Soudure	Date of Seaming Date de Soudure (mm/dd/yy)	Time of Seaming Heure de Soudure	Seam Length Longueur Soudure (m)	Trial Test No. No. Calibration	Technician-Welder Soudeur	Test Date Date de l'essai (mm/dd/yy)	Time Heure	Air-Pressure Pressurisation	Vacuum Box Boîte à Vide	Starting Pressure Pression Départ (psi)	Ending Pressure Pression Fin (psi)	Testing Details/Location Détails de l'essai/Localisation	Approved (Yes/No) Approuvé (Oui/Non)
56-57	09-17-17	17:09	11.3	F-14	K.N	09-17-17	17:32	X	-	30.5	30.5	Full seam	O
57-58	09-18-17	08:25	5.7	F-15	K.N	09-18-17	08:30	X	-	30.5	30	Full seam	O
16-59	09-18-17	10:50	16.7	F-16	K.N	09-18-17	11:49	X	-	31.5	31.5	Full seam	O
45-59	09-18-17	14:24	3.7	F-18	K.N	09-18-17	14:36	X	-	30	30	Full seam	O
46-59	09-18-17	14:24	6.65	F-18	K.N	09-18-17	14:47	X	-	33	32	Full seam	O
47-59	09-18-17	14:24	6.65	F-18	K.N	09-18-17	14:47	X	-	33	32	From East 0m to 2m	O
"	"	"	"	"	"	09-18-17	15:54	X	-	31	30	2m to 6.65m	O
48-59	09-18-17	14:24	0.5	F-18	K.N	09-18-17	15:54	X	-	31	30	Full seam	O
48-60	09-18-17	14:24	6.2	F-18	K.N	09-18-17	15:54	X	-	31	30	Full seam	O
49-60	09-18-17	14:24	6.65	F-18	K.N	09-18-17	15:47	X	-	32	32	Full seam	O
50-60	09-18-17	14:24	6.65	F-18	K.N	09-18-17	15:47	X	-	32	32	Full seam	O
51-60	09-18-17	14:24	6.65	F-18	K.N	09-18-17	16:12	X	-	30.5	29	Full seam	O
52-60	09-18-17	14:24	6.65	F-18	K.N	09-18-17	16:10	X	-	30	29.5	Full seam	O

Texel GEOSOL

Seaming Procedures
Procédures de Soudures

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Project No. / No. de Projet: **C-15152**

Seaming Procedures / Procédures de Soudures						Non-Destructive Testing / Essai Non-Destructif							
Seam No. No. de Soudure	Date of Seaming Date de Soudure (mm/dd/yy)	Time of Seaming Heure de Soudure	Seam Length Longueur Soudure (m)	Trial Test No. No. Calibration	Technician-Welder Soudeur	Test Date Date de l'essai (mm/dd/yy)	Time Heure	Air-Pressure Pressurisation	Vacuum Box Boîte à Vide	Starting Pressure Pression Départ (psi)	Ending Pressure Pression Fin (psi)	Testing Details/Location Détails de l'essai/Localisation	Approved (Yes/No) Approuvé (Oui/Non)
17-60	09-18-17	12:15	16.7	F-17	K.N	09-18-17	12:49	X	-	30	29	Full seam	O
18-60	09-18-17	12:15	16.5	F-17	K.N	09-18-17	12:49	X	-	30	29	Full seam	O
41-59	09-18-17	13:05	2.2	F-17	K.N	09-18-17	13:15	X	-	32	31	Full seam	O
42-59	09-18-17	13:05	4.5	F-17	K.N	09-18-17	13:15	X	-	32	31	Full seam	O
59-60	09-18-17	12:50	6.65	F-17	K.N	09-18-17	13:00	X	-	30.5	29.5	Full seam	O
Patch-59	09-18-17	13:40	12.9	F-18	K.N	09-18-17	13:51	X	-	32	30.5	Full seam	O
Patch-43	09-18-17	14:00	3.2	F-18	K.N	09-18-17	14:13	X	-	30.5	29.5	Full seam	O
Patch-44	09-18-17	14:00	6.65	F-18	K.N	09-18-17	14:13	X	-	30.5	29.5	Full seam	O
Patch-45	09-18-17	14:00	3.2	F-18	K.N	09-18-17	14:13	X	-	30.5	29.5	Full seam	O
Patch-42	09-18-17	PM	0.8	E-6	S.M	09-18-17	PM	-	X	-	-	Full seam	O
61-62	09-19-17	07:37	10	F-19	K.N	09-19-17	07:45	X	-	33.5	33.5	Full seam	O
62-63	09-19-17	07:45	4.9	F-19	K.N	09-19-17	07:51	X	-	30.5	29.5	Full seam	O
66-67	09-19-17	12:35	38.4	F-20	K.N	09-19-17	12:56	X	-	30.5	30	Full seam	O

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Project Name / Nom de Projet: **Rankin Inlet Tank Farm**

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Seaming Procedures / Procédures de Soudures						Non-Destructive Testing / Essai Non-Destructif							
Seam No. No. de Soudure	Date of Seaming Date de Soudure (mm/dd/yy)	Time of Seaming Heure de Soudure	Seam Length Longueur Soudure (m)	Trial Test No. No. Calibration	Technician-Welder Soudeur	Test Date Date de l'essai (mm/dd/yy)	Time Heure	Air-Pressure Pressurisation	Vacuum Box Boîte à Vide	Starting Pressure Pression Départ (psi)	Ending Pressure Pression Fin (psi)	Testing Details/Location Détails de l'essai/Localisation	Approved (Yes/No) Approuvé (Oui/Non)
61-64	09-19-17	08:47	38.8	F-19	K.N	09-19-17	09:10	X	-	32	31.5	Full seam	O
64-65	09-19-17	10:22	38.4	F-19	K.N	09-19-17	10:42	X	-	31	30.5	Full seam	O
65-66	09-19-17	12:12	38.4	F-20	K.N	09-19-17	12:33	X	-	32	31.5	Full seam	O
53-61	09-19-17	17:11	6.65	F-21	K.N	09-19-17	07:29	X	-	30	29	Full seam	O
54-61	09-19-17	17:11	6.65	F-21	K.N	09-19-17	07:36	X	-	30.5	30.5	Full seam	O
55-61	09-19-17	17:11	6.65	F-21	K.N	09-19-17	07:36	X	-	30.5	30.5	Full seam	O
56-61	09-19-17	17:11	6.65	F-21	K.N	09-19-17	07:36	X	-	30.5	30.5	Full seam	O
57-61	09-19-17	17:11	2.5	F-21	K.N	09-19-17	07:42	X	-	30.5	30.5	Full seam	O
57-62	09-19-17	17:11	7.1	F-21	K.N	09-19-17	07:42	X	-	30.5	30.5	Full seam	O
58-62	09-19-17	17:11	1.3	F-21	K.N	09-19-17	AM	-	X	-	-	Full seam	O
58-63	09-19-17	17:11	4.9	F-21	K.N	09-19-17	07:19	X	-	30	29	Full seam	O
67-68	09-19-17	13:27	38.3	F-20	K.N	09-19-17	13:47	X	-	31.5	30	Full seam	O
34-69	09-19-17	16:25	41	F-20	K.N	09-19-17	16:46	X	-	31	31	Full seam	O

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Seaming Procedures / Procédures de Soudures						Non-Destructive Testing / Essai Non-Destructif							
Seam No. No. de Soudure	Date of Seaming Date de Soudure (mm/dd/yy)	Time of Seaming Heure de Soudure	Seam Length Longueur Soudure (m)	Trial Test No. No. Calibration	Technician-Welder Soudeur	Test Date Date de l'essai (mm/dd/yy)	Time Heure	Air-Pressure Pressurisation	Vacuum Box Boîte à Vide	Starting Pressure Pression Départ (psi)	Ending Pressure Pression Fin (psi)	Testing Details/Location Détails de l'essai/Localisation	Approved (Yes/No) Approuvé (Oui/Non)
68-70	09-20-17	13:55	38.6	F-23	K.N	09-20-17	14:14	X	-	30	30	Full seam	O
70-71	09-20-17	14:52	39.5	F-23	K.N	09-20-17	15:58	X	-	30	29	Full seam	O
7-71	09-20-17	16:32	4,7	F-24	K.N	09-20-17	16:45	X	-	30	30	Full seam	O
10-71	09-20-17	16:32	2	F-24	K.N	09-20-17	16:45	X	-	30	30	Full seam	O
10-70	09-20-17	16:32	4,7	F-24	K.N	09-20-17	16:45	X	-	30	30	Full seam	O
11-70	09-20-17	16:32	2	F-24	K.N	09-20-17	16:45	X	-	30	30	Full seam	O
60-61	09-20-17	09:12	6.65	F-22	K.N	09-20-17	10:01	X	-	30	30	Full seam	O
18-64	09-20-17	09:12	2	F-22	K.N	09-20-17	10:00	X	-	31	30	Full seam	O
15-64	09-20-17	09:12	4.7	F-22	K.N	09-20-17	10:00	X	-	31	30	Full seam	O
15-65	09-20-17	09:12	2	F-22	K.N	09-20-17	10:00	X	-	31	30	Full seam	O
14-65	09-20-17	09:12	4.7	F-22	K.N	09-20-17	09:52	X	-	30	28	Full seam	O
14-66	09-20-17	09:12	2	F-22	K.N	09-20-17	09:52	X	-	30	28	Full seam	O
13-66	09-20-17	09:12	4.7	F-22	K.N	09-20-17	09:52	X	-	30	28	Full seam	O

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Seaming Procedures / Procédures de Soudures						Non-Destructive Testing / Essai Non-Destructif							
Seam No. No. de Soudure	Date of Seaming Date de Soudure (mm/dd/yy)	Time of Seaming Heure de Soudure	Seam Length Longueur Soudure (m)	Trial Test No. No. Calibration	Technician-Welder Soudeur	Test Date Date de l'essai (mm/dd/yy)	Time Heure	Air-Pressure Pressurisation	Vacuum Box Boîte à Vide	Starting Pressure Pression Départ (psi)	Ending Pressure Pression Fin (psi)	Testing Details/Location Détails de l'essai/Localisation	Approved (Yes/No) Approuvé (Oui/Non)
13-67	09-20-17	09:12	2	F-22	K.N	09-20-17	09:55	X	-	25	25	Full seam	O
12-67	09-20-17	09:12	4.7	F-22	K.N	09-20-17	09:55	X	-	25	25	Full seam	O
12-68	09-20-17	09:12	2	F-22	K.N	09-20-17	09:55	X	-	25	25	Full seam	O
11-68	09-20-17	09:12	4.7	F-22	K.N	09-20-17	09:55	X	-	25	25	Full seam	O
71-72	09-22-17	14:30	39.5	F-25	K.N	09-22-17	15:32	X	-	33	33	Full seam	O
72-73	09-22-17	15:45	39.6	F-25	K.N	09-22-17	16:04	X	-	33	32.5	Full seam	O
73-74	09-22-17	16:01	40	F-25	K.N	09-22-17	16:21	X	-	30.5	30.5	Full seam	O
74-75	09-22-17	16:20	39.8	F-25	K.N	09-22-17	16:47	X	-	31	31	Full seam	O
75-76	09-22-17	16:45	40.1	F-25	K.N	09-22-17	07:04	X	-	32.5	32	Full seam	O
76-77	09-23-17	07:45	10	F-26	K.N	09-23-17	08:04	X	-	31	30.5	Full seam	O
78-79	09-23-17	08:21	7.3	F-26	K.N	09-23-17	08:26	X	-	30.5	30.5	Full seam	O
78-80	09-23-17	08:50	10.7	F-26	K.N	09-23-17	09:05	X	-	31	31	Full seam	O
80-81	09-23-17	08:55	11.1	F-26	K.N	09-23-17	09:10	X	-	31	30.5	Full seam	O

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Seaming Procedures / Procédures de Soudures						Non-Destructive Testing / Essai Non-Destructif							
Seam No. No. de Soudure	Date of Seaming Date de Soudure (mm/dd/yy)	Time of Seaming Heure de Soudure	Seam Length Longueur Soudure (m)	Trial Test No. No. Calibration	Technician-Welder Soudeur	Test Date Date de l'essai (mm/dd/yy)	Time Heure	Air-Pressure Pressurisation	Vacuum Box Boîte à Vide	Starting Pressure Pression Départ (psi)	Ending Pressure Pression Fin (psi)	Testing Details/Location Détails de l'essai/Localisation	Approved (Yes/No) Approuvé (Oui/Non)
81-82	09-23-17	09:05	11.3	F-26	K.N	09-23-17	09:17	X	-	30.5	30.5	Full seam	O
82-83	09-23-17	09:15	11.6	F-26	K.N	09-23-17	09:23	X	-	30.5	30	Full seam	O
76-83	09-23-17	09:45	6.2	F-27	K.N	09-23-17	10:04	X	-	25	25	Full seam	O
76-82	09-23-17	09:45	6.65	F-27	K.N	09-23-17	10:04	X	-	25	25	Full seam	O
76-81	09-23-17	09:45	6.65	F-27	K.N	09-23-17	10:04	X	-	25	25	Full seam	O
76-80	09-23-17	09:45	6.65	F-27	K.N	09-23-17	10:04	X	-	25	25	Full seam	O
76-78	09-23-17	09:45	4	F-27	K.N	09-23-17	10:04	X	-	25	25	Full seam	O
77-78	09-23-17	09:45	3.9	F-28	K.N	09-23-17	10:11	X	-	30.5	30.5	Full seam	O
77-79	09-23-17	09:45	8	F-28	K.N	09-23-17	10:11	X	-	30.5	30.5	From North 0m to 4.5m	O
"	"	"	"	"	"	09-23-17	10:15	X	-	29	29	4.5m to 8m	O
7-84	09-23-17	13:43	49	F-29	K.N	09-23-17	14:06	X	-	32	32	Full seam	O
84-85	09-23-17	14:06	37.2	F-29	K.N	09-23-17	14:24	X	-	32	30	Full seam	O
84-86	09-23-17	14:24	12	F-29	K.N	09-23-17	14:36	X	-	30.5	30.5	Full seam	O