Baffinland Iron Mines LP
Mary River Expansion Project

Construction Summary Report: Mary River Tank Farm Piping (2019) Piping and Electrical

PERMIT TO PRACTICE
HATCH LTD.
Signature
Date APRIL 8, 2020
PERMIT NUMBER: P 512
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

REGISTERED PROFESSIONAL ENGINEER
G.A. PEACE
LICENSEE
APR. 8, 2020
NT/NU

						Denton Henkelman Digitally signed by Denton Henkelman Date: 2020.04.13 13:11:24 -04'00'
2020-04-08	0	Approved for Use	G. Peace	N. Mason	N. Mason	D. Henkelman
Date	**Rev.**	**Status**	**Prepared By**	**Checked By**	**Approved By**	**Approved By**
			HATCH			**Client**

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Mary River Tank Farm Piping E353004-CX001-130-124-0011 Job Book CVR-062

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Contact Information as per Components 1 and 2 of the Commercial Lease Requirement

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Map to show Construction in Relation to Lease Boundaries and Water Bodies

1. Facility Description

1.1 Purpose and Design Basis

Baffinland Iron Mines Corporation (Baffinland) recently added a new fuel storage area at the Mary River mine site. A 15 million litre above ground diesel fuel storage tank (TK-005) was constructed along with a containment area to allow future expansion. This tank is in addition to the existing 2 million liters of storage in the previously constructed tank farm at Mary River.

The previously constructed Mary River tank farm consisted of four (4) 500,000 litre above ground diesel fuel storage tanks.

A previous report (H353004-40000-121-066-0002) summarized the new 15 million litre tank, the containment area and any piping required to allow filling of the tank. This current report covers the additional piping, electrical and instrumentation that has been installed.

This work was designed and constructed to the following codes and standards:

- National Building Code of Canada (NBC) 2010.
- National Fire Code of Canada (NFCC) 2010.
- NFPA 30, 2012 Edition, Flammable and Combustible Liquids Code.
- CCME Environmental Code of Practice for Aboveground Storage Tank Systems containing Petroleum Products, 2003.
- ANSI B31.3-2012, Process Piping.
- CSA W47.1-09, Certification of Companies for Fusion Welding of Steel.
- CSA W59-03 (R2008) – Welded Steel Construction (Metal Arc Welding)
- CSA W178.2-08, Certification of Welding Inspectors.

1.2 Location and Base Elevations

The new Mary River Tank Farm is located northeast of the Sailiivik Camp on the north side of the Tote Road between northing N7913385 and N7913535, and easting E560953 and E561212. The elevation of the tank farm is 187 masl.

1.3 Geometry and Access

The piping, electrical and instrumentation was constructed as shown on the as-built drawings.

1.4 Earthworks Materials Details

Details of the earthworks are contained in the report for the tank farm and containment area report.

2. Construction Activity Summary

Construction activities for the piping, electrical and instrumentation for the 15 million litre tank started July 10, 2019 and ended on December 16, 2019.

The following summarizes construction activities:

2.1 Piping

- Piping was fabricated and installed from the existing piping at the tank to the location where the future fuel module will be installed and to a point to allow access to additional future tank(s).
- Piping was tested, refer to Appendix B.

2.2 Electrical

- Installed air-craft obstruction lighting.
- Installed stairway lighting (without lens cages protection, as they were not available).
- Ground grid was completed.

2.3 Instrumentation

Tank level radar gauge installed.

3. QA/QC

Quality Assurance (QA) was performed by the Hatch Construction Supervisor during daily audits with the Nuna/ADCO Supervisor during construction. Quality Surveillance Inspection Acceptance and Sign-off Reports were prepared by the Nuna/ADCO Supervisor and signed of by the Hatch Representative.

QA was also performed by the Hatch Construction Supervisor during daily audits with the contract supervisors.

4. Photographic Records

Photo 4-1: Grounding Grid

Photo 4-2: Grounding Grid Installation

Photo 4-3: Pipe Stands

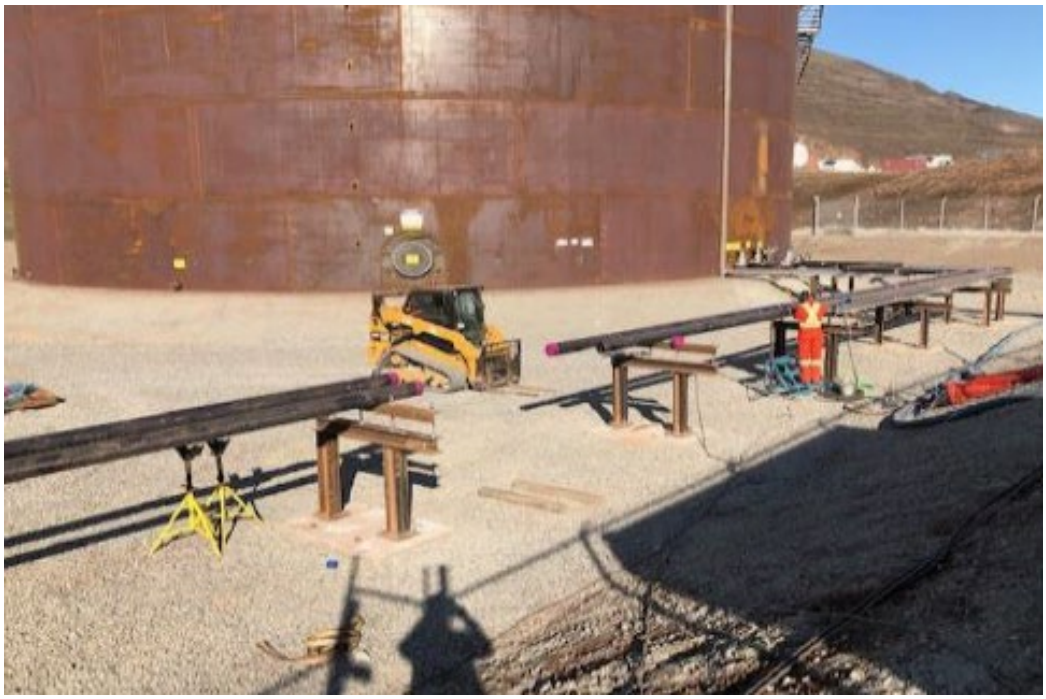


Photo 4-4: Piping Installation

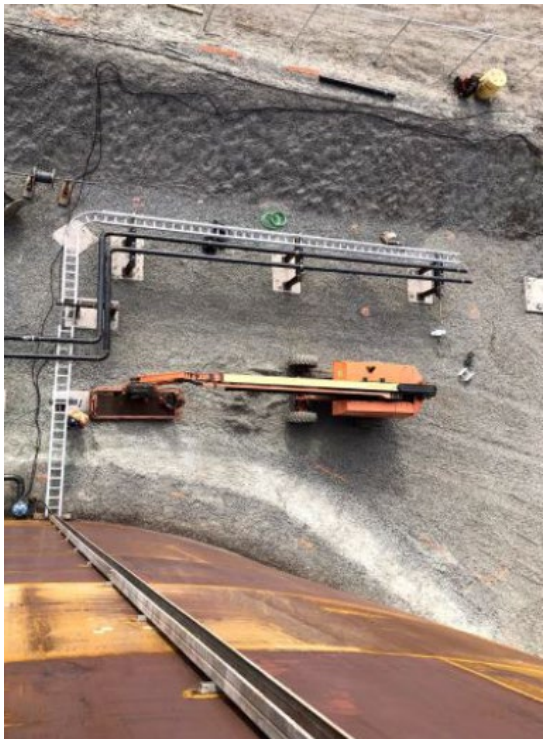


Photo 4-5: Tank 005 Cable Tray Installation

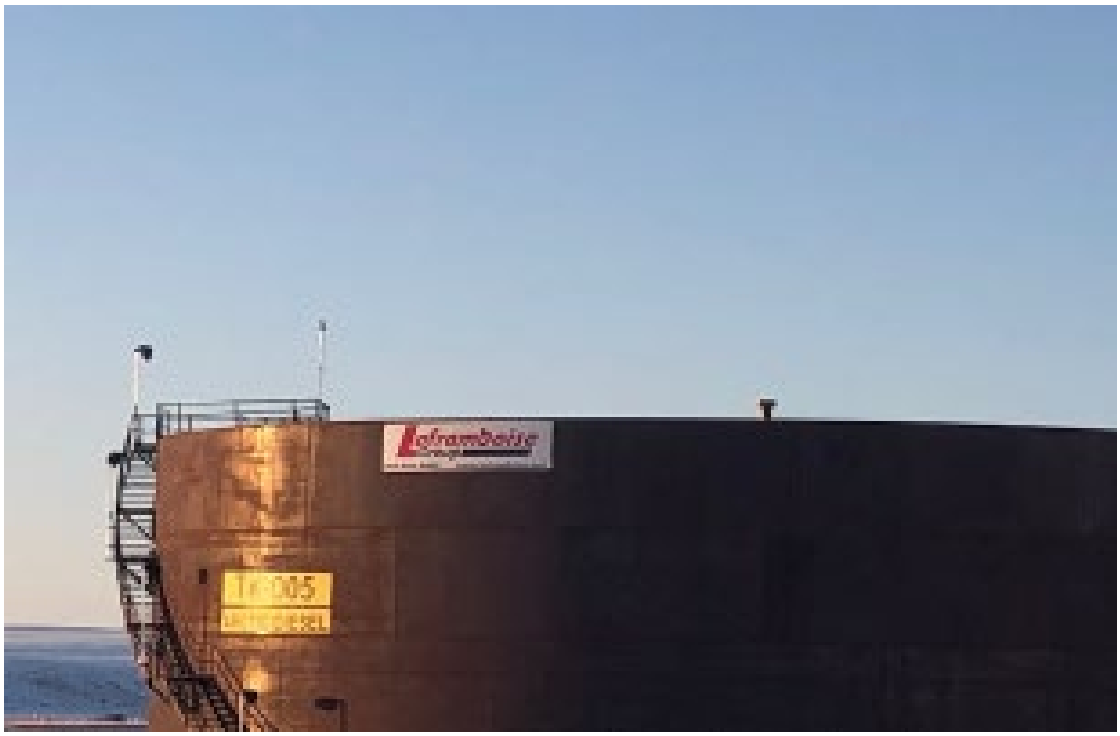


Photo 4-6:Top of Tank showing Obstruction and other Lighting

Photo 4-7: Obstruction light

Photo 4-8: Pipe Spools

Photo 4-9: Pipe Fabrication

Photo 4-10: Valves near Future Dispensing Module Location

Photo 4-11: Radar Level Gauge

Photo 4-12: Dispensing Fuel

5. As-built Drawings

The as-built drawings incorporate contractor red line markups, field instructions, requests for information, field sketches and all other inputs provided by the Engineering, Procurement, Construction Management (EPCM) field team. As-built drawings are attached in Appendix A. These drawings are representative of the final as-built conditions.

Table 5-1: As-built Drawing List

Drawing Number	Title	Revision
H353004-10000-210-276-0001-0001	Mine Site Additional Tank Farm Storage P&ID	4
H353004-10000-240-272-0003-0001	Mine Site Tank Farm Enlarged Piping Plan	4
H353004-10000-260-272-0002-0001	Mine Site New Reticulation Layout Layout Drawing	4
H353004-10000-260-272-0005-0001	Mine Site Tank Farm Electrical General Arrangement	2
SM-Redline 190806 MRTF Ground Grid	Mine Site Tank Farm Grounding Redline Asbuilt Aug. 3/19	
CAB 190903 MRTF Tk 5 & 6 Grnd Cables-Rods & Pipe Crossing	Mary River Tank Farm Ground Grid and Rods Asbuilt 2019	

6. Field Decisions

The following section describes the field decisions made during construction:

- UT (Ultrasonic Testing) was allowed in lieu of X-Ray for welded pipe joints (RFI 0029).
- Relocation of the thermal relief valve 10000-25-PRV-016 was allowed (RFI 0044).
- Repair procedure for the leak at the socket weld was accepted (RFI 0090).
- Check valve 10000-100-VCH-024 was installed in reverse to allow for gravity draw from TK-005.
- The fuel module was not connected.
- Blinds were installed on the piping at the location of the fuel module along with valves upstream of the blinds.
- Additional support was added for the piping at the fuel module location.
- Cable tray was relocated where it approaches the tank.
- Terminations for the stairway lighting, obstruction lighting and radar gauge are temporary. See as built for location of Junction box.

7. Performance Evaluation

As of the date of this report there have been no adverse observations in operational performance of the work constructed under this scope.

8. Vibration Monitoring and Quarrying Activity

No vibration monitoring was conducted during the construction of this work as it was not deemed necessary based on the scope of activities required for construction. No quarrying activities were conducted for the scope of activities covered in this report.

9. Environmental Monitoring

Baffinland Environment was responsible for environmental monitoring at the site during this work and following-up with construction if there were any reported environmental incidents or non-conformances.

The Spill Contingency Plan (BAF-PH1-830-P16-0036), in conjunction with the Emergency Response Plan (BAF-PH1-830-P16-0007), provides guidance and instructions for first responders and Baffinland Management in the event of a spill event or other emergency such as fire or accident.

The risks to the environment as a result of construction activity for this work would originate from spills from equipment. There were no spills reported.

10. Earthworks Data

There were no earthworks performed under this scope, therefore there is nothing to report for Earthworks data.

11. Unanticipated Observations

A small leak was detected in a socket weld after the tank had been partially filled. The fuel that leaked was captured prior to any fuel reaching the ground in the tank farm. The leak was repaired with no spill to the environment.

12. Surface Monitoring

Not applicable.

13. Required Maintenance

Not applicable.

14. Adaptive Management

Construction changes were managed through issue of Engineering Change Notices (ECNs) for changes to the design and through Requests For Information (RFIs) for changes requested by the Contractor.

For discussion of adaptive management principles and practices applied and their overall effectiveness please refer to the Annual Report to the Nunavut Water Board and the Nunavut Impact Review Board..

15. Concordance with Type "A" Water Licence

Baffinland's Type A Water Licence, Schedule D, outlines the requirements for Construction Summary/Monitoring Reports. Table 15-1 provides a concordance of this report with the requirements of Schedule D.

Table 15-1: Concordance with Type "A" Water Licence

Schedule D Item No.	Schedule D Description	Corresponding Section in this Report
1a	Description of all infrastructure and facilities designed and constructed to contain, withhold, divert or retain Water and/or Waste;	1
1b	A summary of construction activities including photographic records before, during and after construction of the facilities and infrastructure designed to contain, withhold, divert or retain Water and/or Waste;	2, 3, 4
1c	As-built drawings and design for facilities and infrastructure, in Item 1(a) of this schedule, designed and constructed to contain, withhold, divert or retain Water and/or Waste;	5
1d	Documentation of field decisions that deviate from the original plans and any data used to support or developed facilities and infrastructure to withhold, divert or retain Water and/or Waste;	6
1e	A comparison of measured versus predicted performance of infrastructure and facilities;	7
1f	Any blast vibration monitoring and control for quarrying activity carried out in close proximity to fish bearing waters;	8
1g	Monitoring conducted for sediment and explosives residue release from construction areas;	9
1h	Monitoring undertaken in accordance with Part D of the Licence during the Construction Phase of the Project;	8, 9
1i	Details confirming that the requirements of the CCME guidance document entitled "Aboveground Storage Tank Systems for Petroleum and Allied Petroleum Products (2003)" have been met by the Licensee;	N/A
1j	Data collected from instrumentation used to monitor earthworks and the interpretation of that data;	10
1k	A discussion of any unanticipated observations including changes in risk and mitigation measures implemented to reduce risk during construction;	11
1l	An overview of any method including frequency used to monitor deformations, seepage and geothermal responses;	12
1m	A summary of maintenance work undertaken as a result of settlement or deformation of dikes and dams;	13
1n	A summary of adaptive management principles and practices applied during the relevant phases of the Project and their overall effectiveness.	14

16. Concordance with Commercial Lease Requirements

The following table provides a concordance of this report with the requirements of the Commercial Lease for As-built reporting.

Table 16-1: Concordance for Commercial Lease As-built Requirements

Component	Minimum Information Requirements	Corresponding Section in this report
1	The name and contact information of the person and company responsible for completing the construction, construction monitoring and preparing the As-built Report	Appendix C
2	The name and contact information of the Baffinland representatives(s) that QIA can contact should it have any questions or comments regarding the As-built Report	Appendix C
3	An introduction to the infrastructure or facilities including but not limited to the construction background, concept and construction history	1,2
4	Construction records including As-Built drawings signed and stamped by a professional engineer detailing surveys, planar and cross sections that illustrate all designed components. This should be provided in PDF format and if requested the native file (e.g. CAD, .dxf, etc.)	Appendix A Appendix B
5	Detailed description of any deviations from the For Construction Design. Deviations that should be noted include, but are not limited to, changes in design and construction materials, construction methodology or monitoring	6
6	Observed performance of the construction including a comparison to predicted performance. Recommendations for performance monitoring based on observations during construction if applicable	NA
7	A description and list of instrumentation installed, if applicable, and results of construction monitoring including all environmental data. Recommendations for additional performance or environmental monitoring based on observations and monitoring results, if applicable.	NA
8	A summary of quality assurance testing results, if applicable, and comparison of these results to construction/design requirements to ensure performance of the infrastructure or facilities.	3 Appendix B
9	A summary of adaptive management principles and practices related to environmental management and monitoring applied during the relevant phases of the Project and their overall effectiveness	NA
10	Photographic records before, during and after construction of the facilities or infrastructure.	4
11	Map(s) to illustrate the completed construction in relation to Lease boundaries and water bodies. The minimum distance from completed or modified facilities and infrastructure to the surveyed boundary of the Property, surveyed boundary of the Impact Area, and the original high water mark should be provided.	Appendix D

Appendix A

As-built Drawings

DWG. No. H353004-10000-210-276-0001-0001

AS BUILT

NAME: Andrew Hanlon

DATE: Dec 9, 2019

SIGNATURE:

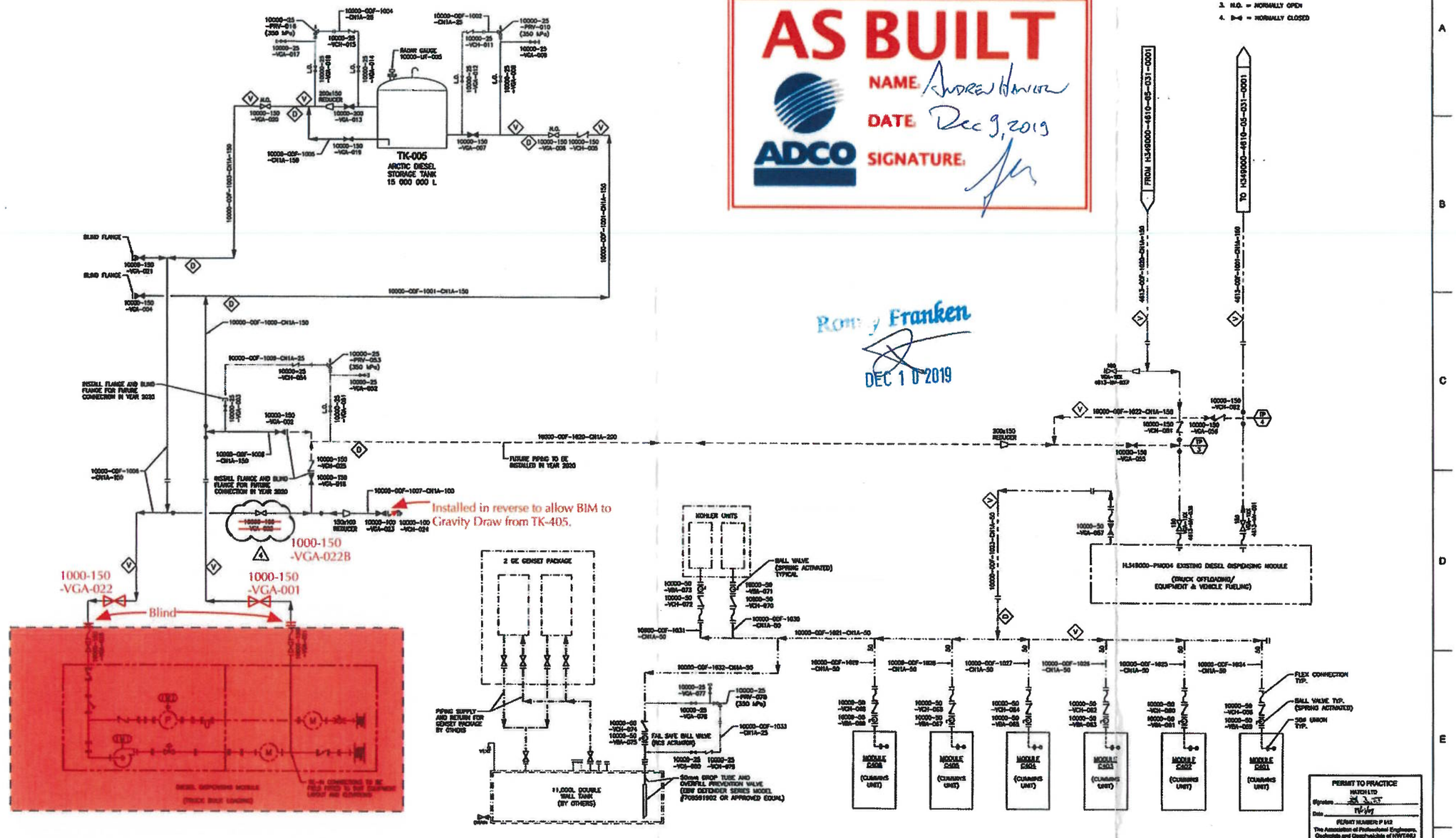
ADCO

Ronny Franken

DEC 10 2019

VALVE TAGGING NOTES:

1. IDENTIFY ALL VALVES WITH TAG IDENTIFICATION MARKERS AS INDICATED ABOVE. TAGS SHALL BE OCTAGONAL 316 S.S., MIN 22 GA., ETCHED w/BLACK LEGIBLE CHARACTERS.
2. L.O. = LOCKED OPEN
3. N.O. = NORMALLY OPEN
4. N.C. = NORMALLY CLOSED



PERMIT TO PRACTICE
HATCH LTD
Signature
Date
PERMIT NUMBER: P 542
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

DRAWING No.	DRAWING TITLE
H353004-00000-240-272-0003-0001	MINE SITE TANK FARM ENLARGED PIPING PLAN
H353004-00000-210-282-0001-0001	MINE SITE FUEL SYSTEM PROCESS FLOW DIAGRAM
H353004-00000-270-278-0001-0001	PROJECT LEGEND SHEET

REFERENCE DRAWINGS

REG. PROFESSIONAL

No.	DESCRIPTION	BY	CHK'D	DATE
4	VALVE ADDED; ADDITIONAL LINE NUMBERS ADDED	SJM	MMI	19-09-09
3	PIPING MODIFICATIONS AT MODULE, INTERCONNECT AND GENSET PIPING ADDED; LEGEND REVISED	SJM	MMI	19-08-02
2	ADDITIONAL STORAGE TANK TK-006 ADDED	SJM	MMI	19-02-01
1	VALVE TAGGING NOTE UPDATED	HPC	MMI	19-01-18
0	ISSUED FOR CONSTRUCTION	HPC	MMI	18-07-25

REVISIONS

HATCH

DRAFTSPERSON	H. P. CURRIE	NR		18-05-05
DESIGNER	J. MacLEAN	NR		18-05-04
CHECKER	M. MacINTYRE			19/09/19
DESIGN COORD.	M. MacINTYRE			19/09/19
RESP. ENG.	F. BUTTS			19/09/19
LEAD DISC. ENG.	J. MacLEAN			19/09/19
ENG. MANAGER	S. DeYOUNG			
PROJ. MANAGER	M. HAAKSMA			
CLIENT	D. HENKELMAN			
ROLE	NAME	SIGNATURE	DATE	

DRAWING APPROVAL STATUS: Approved for Construction

Baffinland

MARY RIVER EXPANSION PROJECT
BAFFINLAND IRON MINES LP

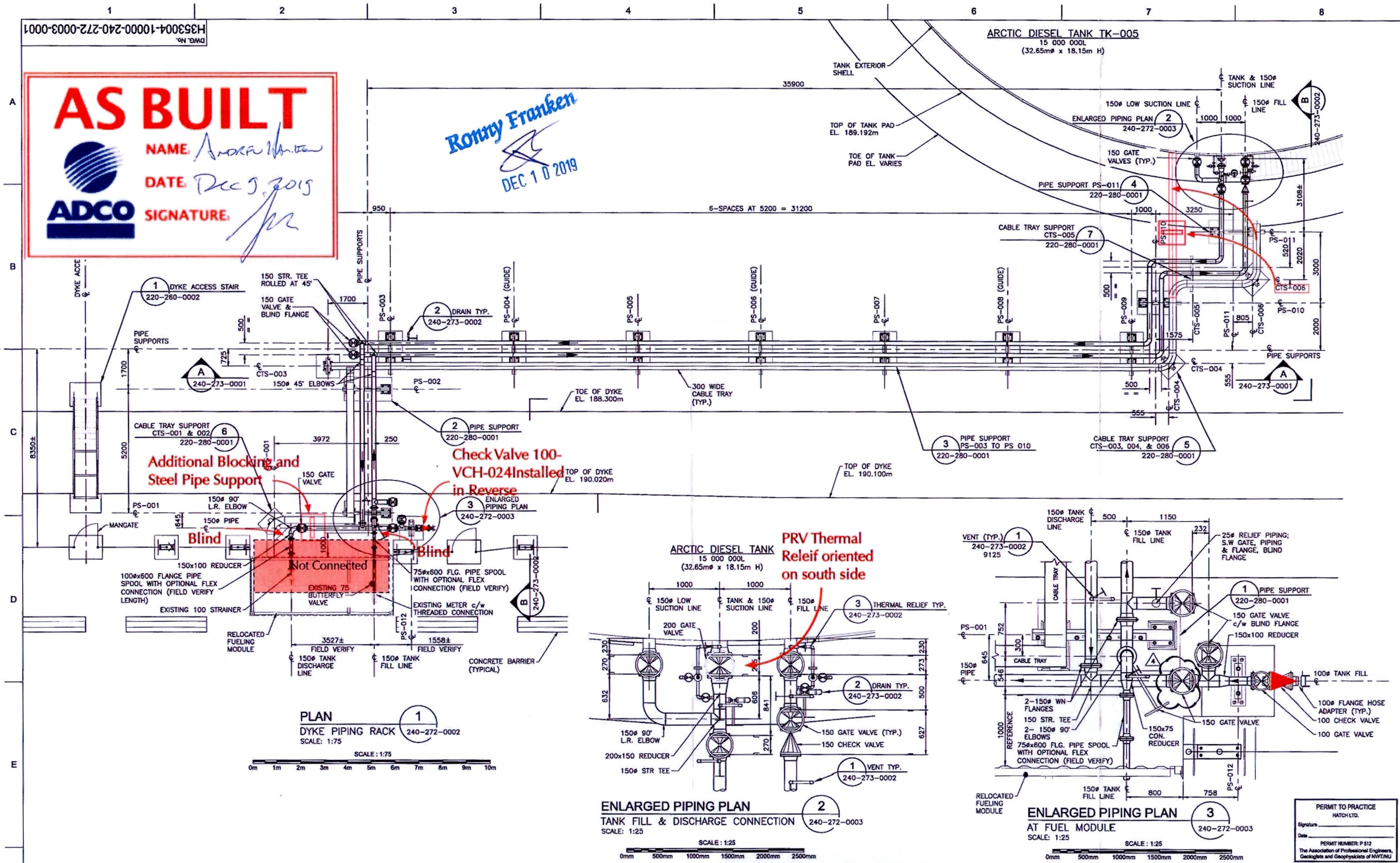
MINE SITE
ADDITIONAL TANK FARM STORAGE
P & ID

SCALE: NTS OR AS NOTED

DWG. No.: H353004-10000-210-276-0001-0001

REV: 4

SHEET SIZE: A1


H353004-10000-240-272-0003-0001
DWG. No.
AS BUILT
NAME
DATE Dec 9, 2019
SIGNATURE
ADCO
Ronny Franken
DEC 1 0 2019
ARCTIC DIESEL TANK TK-005
15 000 000L
(32.65mø x 18.15m H)
TANK EXTERIOR SHELL
TOP OF TANK PAD EL. 189.192m
TOE OF TANK PAD EL. VARIES
150ø LOW SUCTION LINE
TANK & 150ø SUCTION LINE
150ø FILL LINE
ENLARGED PIPING PLAN 2 240-272-0003
150 GATE VALVES (TYP.)
PIPE SUPPORT PS-011 4 220-280-0001
CABLE TRAY SUPPORT CTS-005 7 220-280-0001
6-SPACES AT 5200 = 31200
DYKE ACCESS STAIR 1 220-260-0002
150 STR. TEE ROLLED AT 45°
150 GATE VALVE & BLIND FLANGE
DRAIN TYP. 2 240-273-0002
PIPE SUPPORTS
CTS-003
150ø 45° ELBOWS
PS-002
300 WIDE CABLE TRAY (TYP.)
TOE OF DYKE EL. 188.300m
PIPE SUPPORT 2 220-280-0001
PIPE SUPPORT PS-003 TO PS 010 3 220-280-0001
CABLE TRAY SUPPORT CTS-003, 004, & 006 5 220-280-0001
TOP OF DYKE EL. 190.100m
CABLE TRAY SUPPORT CTS-001 & 002 6 220-280-0001
Additional Blocking and Steel Pipe Support
Check Valve 100-VCH-024Installed in Reverse
150 GATE VALVE
TOP OF DYKE EL. 190.020m
ENLARGED PIPING PLAN 3 240-272-0003
150ø 90° L.R. ELBOW
150ø PIPE
MANGATE
Blind
Not Connected
150x100 REDUCER
100øx600 FLANGE PIPE SPOOL WITH OPTIONAL FLEX CONNECTION (FIELD VERIFY LENGTH)
EXISTING 100 STRAINER
EXISTING 75 BUTTERFLY VALVE
75øx600 FLG. PIPE SPOOL WITH OPTIONAL FLEX CONNECTION (FIELD VERIFY)
EXISTING METER c/w THREADED CONNECTION
RELOCATED FUELING MODULE
3527± FIELD VERIFY
1558± FIELD VERIFY
150ø TANK DISCHARGE LINE
150ø TANK FILL LINE
CONCRETE BARRIER (TYPICAL)
PLAN
DYKE PIPING RACK 1 240-272-0002
SCALE: 1:75
ARCTIC DIESEL TANK
15 000 000L
(32.65mø x 18.15m H)
PRV Thermal Releif oriented on south side
THERMAL RELIEF TYP. 3 240-273-0002
200 GATE VALVE
DRAIN TYP. 2 240-273-0002
150ø 90° L.R. ELBOW
200x150 REDUCER
150ø STR TEE
150 GATE VALVE (TYP.)
150 CHECK VALVE
VENT TYP. 1 240-273-0002
ENLARGED PIPING PLAN 2
TANK FILL & DISCHARGE CONNECTION 240-272-0003
SCALE: 1:25
150ø TANK DISCHARGE LINE
150ø TANK FILL LINE
VENT (TYP.) 1 240-273-0002
25ø RELIEF PIPING; S.W GATE, PIPING & FLANGE, BLIND FLANGE
PIPE SUPPORT 1 220-280-0001
150 GATE VALVE c/w BLIND FLANGE
150x100 REDUCER
CABLE TRAY
100ø TANK FILL
100ø FLANGE HOSE ADAPTER (TYP.)
100 CHECK VALVE
100 GATE VALVE
2-150ø WN FLANGES
150 STR. TEE
2- 150ø 90° ELBOWS
75øx600 FLG. PIPE SPOOL WITH OPTIONAL FLEX CONNECTION (FIELD VERIFY)
150x75 CON. REDUCER
150 GATE VALVE
RELOCATED FUELING MODULE
ENLARGED PIPING PLAN 3
AT FUEL MODULE 240-272-0003
SCALE: 1:25
PERMIT TO PRACTICE
HATCH LTD.
PERMIT NUMBER: P 512
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

H353004-10000-210-276-0001-0001	MINE SITE ADDITIONAL TANK FARM STORAGE P&ID
H353004-10000-210-282-0001-0001	MINE SITE FUEL SYSTEM PROCESS FLOW DIAGRAM
H353004-10000-240-272-0002-0001	MINE SITE TANK FARM GENERAL ARRANGEMENT
H353004-10000-240-270-0001-0001	MINE SITE 15,000,000L ARCTIC DIESEL TANK TK-005
H353004-10000-240-270-0002-0001	MINE SITE 15,000,000L ARCTIC DIESEL TANK TK-006
H353004-10000-240-273-0001-0001	MINE SITE TANK FARM PIPING SECTION-A
H353004-10000-240-273-0002-0001	MINE SITE TANK FARM PIPING SECTIONS & MISCELLANEOUS DETAILS
H353004-10000-220-280-0001-0001	MINE SITE TANK FARM PIPE SUPPORTS
H353004-10000-220-280-0002-0001	MINE SITE PIPE SUPPORTS CONCRETE BASE DETAILS
H353004-10000-260-272-0005-0001	MINE SITE TANK FARM ELECTRICAL GENERAL ARRANGEMENT

REGISTERED PROFESSIONAL ENGINEER F.E. BUTTS LICENSEE NT/NU

4	GATE VALVE ADDED			
3	EXISTING PORT SITE FUEL MODULE UTILIZED, PIPING MODIFIED TO SUIT; ENLARGED PIPING PLAN -3 ADDED;	HPC	MMI	19-10-06
2	ADDITIONAL STORAGE TANK TK-006 ADDED	HPC	MMI	19-02-01
	CTS- 002 DELETED; RELIEF PIPING AT TANK NOZZLES MODIFIED. STAIRS RELOCATED		MMI	

DRAFTSPERSON	H. P. CURRIE	NR	18-06-19
DESIGNER	J. MacLEAN	NR	18-06-19
CHECKER	M. MacINTYRE		
DESIGN COORD.	M. MacINTYRE		
RESP. ENG.	F. BUTTS		
LEAD DISC. ENG.	J. MacLEAN		

HATCH

Baffinland

MARY RIVER EXPANSION PROJECT
BAFFINLAND IRON MINES LP

MINE SITE

DWG. No. H353004-10000-260-272-0002-0001

NUNA Group of Companies

NLP QA/QC
Reviewed/Approved

Signature Date

NUNA Group of Companies

NLP QC
Released for Use

LEGEND

— — -	ELECTRICAL CABLE ROUTE

AS BUILT
NAME:
DATE:
ADCO SIGNATURE:

LEVEL CROSSING BOOM (BY OTHERS)

PIPE CULVERT/SLEEVES UNDER ROAD

CABLE TO BE ROUTED ADJACENT TO SERVICE ROAD

NEW 600V FEED TO ROAD LEVEL CROSSING

SEE DETAIL A

SLEEVE

800 MAN CAMP TYPE 4 E-HOUSE

PANEL PP

FOR DETAILS OF CABLE ROUTE FOR 800 MAN CAMP SEE DRAWING H353004-10000-260-272-0001-0001

3 x NEW POWER CABLE TO 800 MAN CAMP

2 x KOHLER UNITS ADDED

ARCH CULVERT SERVICES CONDUIT BY CC003

FOR DETAILS OF CABLE BERM SECTION SEE DRAWING H353004-10000-221-271-0001-0001

CABLE FEED TO RAIL WEIGHBRIDGE (AT CH 107850) FEEDER FROM NEW DB IN NEW E-HOUSE AT CRUSHER PAD

RELOCATED E-HOUSE 11 (4750-BLD-011)

RELOCATED MCC/CONTROL TRAILER BY CM007

DETAIL B

RELOCATED AND MODIFIED CRUSHERS BY CM007

RECEIVING STATION

TREATED EFFLUENT PUMP STATION

1 x 3c/#2/0 AWG 90 TECK 1kV CABLE CONNECTED TO SECOND 100A SPARE BREAKER IN PANEL 1611-MDB-010

1 x 3c/#2/0 AWG 90 TECK 1kV CABLE (+/- 100m) CONNECTED TO FIRST 100A SPARE BREAKER IN PANEL1611-MDB-010

PANEL 1611-MDB-010 CONNECT CABLES TO SPARE 100A BREAKERS IN PANEL

FOR DETAILS OF CABLE ROUTING AT 800 MAN CAMP SEE DRAWING H353004-10000-260-272-0001-0001

SLEEVE

800 MAN CAMP TYPE 4 E-HOUSE

PANEL PP

F WING
E WING
G WING
H WING
D WING
C WING
J WING
I WING

DETAIL A

Distribution not installed

ELECTRICAL DISTRIBUTION PANEL IN THE NEW FUEL FARM MODULE
FUEL MODULE LOAD 130kVA
(PUMP STATION) (125A INCOMER AT 600V)
LIGHTS FED FROM LIGHTING DISTRIBUTION PANEL
(240/120V PANEL) WITHIN NEW FUEL FARM MODULE

150Ø STEEL PIPE SLEEVE

Temp power for obstruction light and radar gauge

Hatch office power distribution

2 x 150Ø STEEL PIPE SLEEVE

HATCH OFFICES

350mcm cable pulled and coiled up at tank farm fuel module and at location of future Junction Box 1611-EJB-010

INSTALL JUNCTION BOX 1611-EJB-010 AND CONNECT TO EXISTING 3c/350MCM CABLE SUPPLYING REEFERS AND EXTEND BARE COPPER EARTH CABLE # 3 AWG FROM JUNCTION BOX TO NEW FUEL FARM

4750-BLD-001
ACCOMIDATION AREA
E-HOUSE TYPE 1

2 x JUNCTION BOXES CUT INTO FEED CABLES F06 FROM GENERATOR STATION 4530-BLD-0007 TO ACCOMMODATION AREA E-HOUSE 4750-BLD-001

INSTALL ADDITIONAL NEW 3c/350MCM 5kV HV TECK CABLE FROM GENERATOR STATION 4530-BLD-007, F06 TO ACCOMMODATION AREA E-HOUSE 4750-BLD-001

SLEEVES UNDER ROAD

SLEEVES UNDER ROAD

INSTALL:
2 x 3c/350MCM 5kV HVTECK Cu CABLES
2 x # 4/0 AWG BARE COPPER

TRUCK WORKSHOP PAD MOUNTED TRANSFORMER BY TX003

1 x NEW GENERATOR BUILDING
1 x 4160kV & 13.8kV SWITCH GEAR ROOM AND
2 x 13.8kV TRANSFORMERS
2 x 3505 kW GENERATORS

EXISTING E-HOUSE

EXISTING GENERATORS

CUT INTO CABLES FEEDING TO E-HOUSE No. 8 (4750-BLD-008) AND INSTALL JUNCTION BOXES TO FEED RELOCATED E-HOUSE No. 11 (4750-BLD-011)

NEW POWER CABLE TO E-HOUSE 11 (4750-BLD-011)

RELOCATED JUNCTION BOX #1 AND #2

EXISTING E-HOUSE 8

RECOVER 2 x JUNCTION BOXES

EXISTING CRUSHERS A TO BE RELOCATED BY CM007

EXISTING MCC TO BE RELOCATED CM007

2 x EXISTING POWER CABLES

REMOVE CABLE FEEDING E-HOUSE 11

SPLICE CABLE TO EXISTING E-HOUSE 8

EXISTING CRUSHERS B TO BE RELOCATED CM007

REMOVE THIS CABLE

EXISTING CRUSHERS C TO BE RELOCATED CM007

EXISTING E-HOUSE 11 (4750-BLD-011) TO BE RELOCATED

HOLD

A
B
C

NEW CABLE TERMINATION IN E-HOUSE 11

RELOCATED E-HOUSE11

RELOCATED MCC

DETAIL B

DRAWING No.	DRAWING TITLE
H350004-10000-260-288-0001-0001	MINE SITE 4160V & 600V DISTRIBUTION - SINGLE LINE DIAGRAM
H350004-00000-221-294-0003-0001	SITEWIDE STANDARD DRAWING - EARTHWORKS & DRAINAGE DETAILS
H350004-10000-260-272-0001-0001	800 PERSON CAMP CABLE ROUTING - LAYOUT
H350004-10000-221-271-0001-0001	UTILITY BENCH AT CRUSHER PAD - PLAN AND PROFILE
H350004-10000-221-271-0002-0001	UTILITY BERM TO TRUCK WORKSHOP - PLAN AND PROFILE

REFERENCE DRAWINGS

REG. PROFESSIONAL

APPROVED FOR CONSTRUCTION

No.	DESCRIPTION	BY	CHK'D	DATE
4	NEW FUEL FARM MODULE SUPPLY	TX	WDB	09-07-2019
3	ADDED NEW GENERATOR SWITCHGEAR	DP	WDB	11-04-2019
2	UPDATED CABLE DESCRIPTION	DP	WDB	02/10/2018
1	HOLD ON TRUCK WORKSHOP REMOVED, POWER TO NEW FUEL FARM & TO EFFLUENT PUMP STATION & RECEIVING STATION	DP	WDB	13/08/2018
0	APPROVED FOR CONSTRUCTION	DP	WDB	04/05/2018

REVISIONS

HATCH

ROLE	NAME	SIGNATURE	DATE
DRAFTSPERSON	T XULU	NR	09-07-2019
DESIGNER	T XULU	NR	09-07-2019
CHECKER	W DE BRUTO		
DESIGN COORD.	R GOOSEN		
RESP. ENG.	J WIKSTON		
LEAD DISC. ENG.	W DE BRUTO		
AREA LEAD	M HAAKSMA		
ENG. MANAGER	R GOOSEN		
AREA MANAGER	T ATIBA		

DRAWING APPROVAL STATUS: Approved for Construction

Baffinland

BAFFINLAND IRON MINES LP
MARY RIVER EXPANSION PROJECT

MINE SITE
NEW RETICULATION LAYOUT
LAYOUT DRAWING

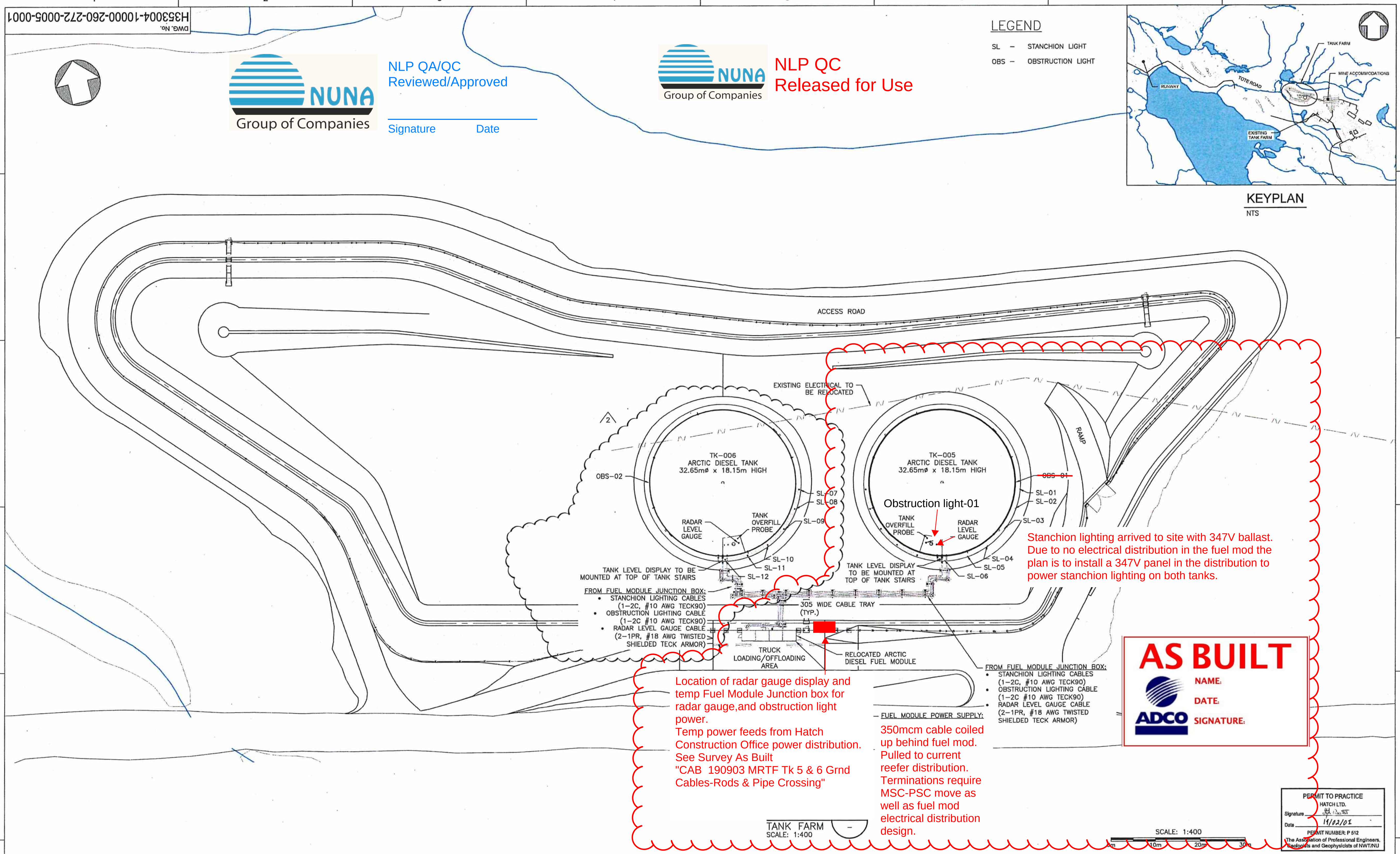
SCALE: OR AS NOTED

DWG. No.: H353004-10000-260-272-0002-0001

REV: 4

SHEET SIZE: D

jdc pwservice 22-JUL-2019 14:07 \\DCPWPDF03\PDFtemp\842181115102_30\H353004-10000-260-272-0002-0001.dgn



THIS DRAWING WAS PREPARED BY HATCH LTD. ("HATCH") FOR THE EXCLUSIVE USE OF BAFFINLAND IRON MINES LP ("CLIENT") AND ITS USE IS SUBJECT TO THE TERMS AND CONDITIONS OF THE CONTRACT BETWEEN HATCH AND THE CLIENT, INCLUDING ANY LIMITATIONS ON LIABILITY CONTAINED THEREIN. THIS DRAWING AND ITS CONTENTS REMAIN THE INTELLECTUAL PROPERTY OF HATCH SUBJECT TO CLIENT'S ROYALTY-FREE, IRREVOCABLE, PERPETUAL AND NON-EXCLUSIVE LICENSE TO USE AND REPRODUCE THE DRAWING FOR PURPOSES CONNECTED WITH THE PROJECT, INCLUDING THE CONSTRUCTION, COMPLETION, MAINTENANCE, EXTENSION, REINSTATEMENT AND REPAIR OF THE PROJECT. THIS DRAWING, AND THE INFORMATION CONTAINED HEREIN, SHALL BE TREATED AS CONFIDENTIAL FOR ALL OTHER PURPOSES AND SHALL NOT BE MODIFIED WITHOUT THE WRITTEN CONSENT OF HATCH.

REFERENCE DRAWINGS

DRAWING No.	DRAWING TITLE
H353004-10000-240-272-0002-0001	MINE SITE TANK FARM GENERAL ARRANGEMENT
H353004-10000-260-260-0001-0001	MINE SITE ELECTRICAL DETAILS
H353004-10000-240-260-0001-0001	MINE SITE FUEL SYSTEM TYPICAL VERTICAL TANK DETAILS

REG. PROFESSIONAL: J.M. WIKSTON, LICENSEE, HATCH, NT/NU

REVISIONS

No.	DESCRIPTION	BY	CHK'D	DATE
2	ADDITIONAL STORAGE TANK T-006, ELECTRICAL AND PIPING	SJM		19/02/01
1	DYKE REVISED	BM	MML	18-12-20
0	ISSUED FOR CONSTRUCTION	BM	MML	18-07-25

HATCH

ROLE	NAME	SIGNATURE	DATE
DRAFTSPERSON	B. MERCER	NR	18-07-02
DESIGNER	M. MacLEAN	NR	18-07-02
CHECKER	M. MacINTYRE		19/02/01
DESIGN COORD.	M. MacINTYRE		19/02/01
RESP. ENG.	F. BUTTS		19/02/01
LEAD DISC. ENG.	J. WIKSTON		19/02/08
ENG. MANAGER	G. PEACE		19/02/08
AREA. MANAGER	H. VENTER		19/02/15
CLIENT	T. ATIBA		19/02/15

DRAWING APPROVAL STATUS: Approved for Construction

Baffinland

MARY RIVER EXPANSION PROJECT
BAFFINLAND IRON MINES LP

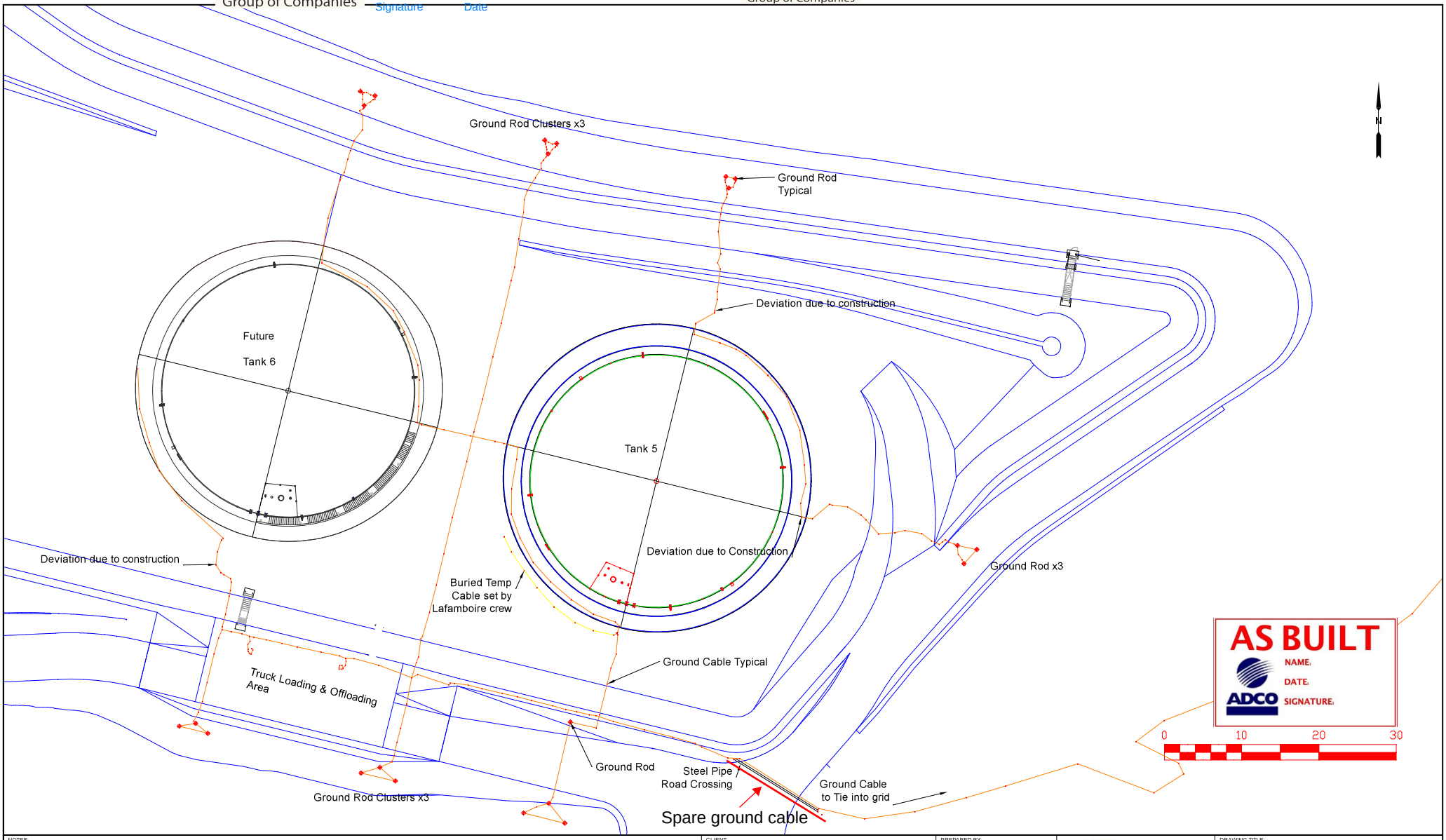
MINE SITE
TANK FARM ELECTRICAL
GENERAL ARRANGEMENT

SCALE 1:400 OR AS NOTED
DWG. No. H353004-10000-260-272-0005-0001
REV 2
SHEET SIZE: A1

NLP QA/QC
Reviewed/Approved

Signature Date

NLP QC
Released for Use



NOTES:
Asbuilt Ground Grid overlaid on Hatch Construction Lines
Ground Rod location field fit at site See attach RFI responseE353004-CX001-400-465-0062_0_V2.pdf

CLIENT:
Baffinland Iron Mines Corporation

PROJECT:
Mary River Expansion Project,
Baffin Island, Nunavut

PREPARED BY:
Nuna East Ltd.
9839 - 31 Avenue
Edmonton, AB
T6N 1C5

DRAWN BY: mc
SCALE: barscale
DATE: Aug 6, 2019

DRAWING TITLE:
Mine Site
Tank Farm Grounding
Redline Asbuilt Aug. 3/19

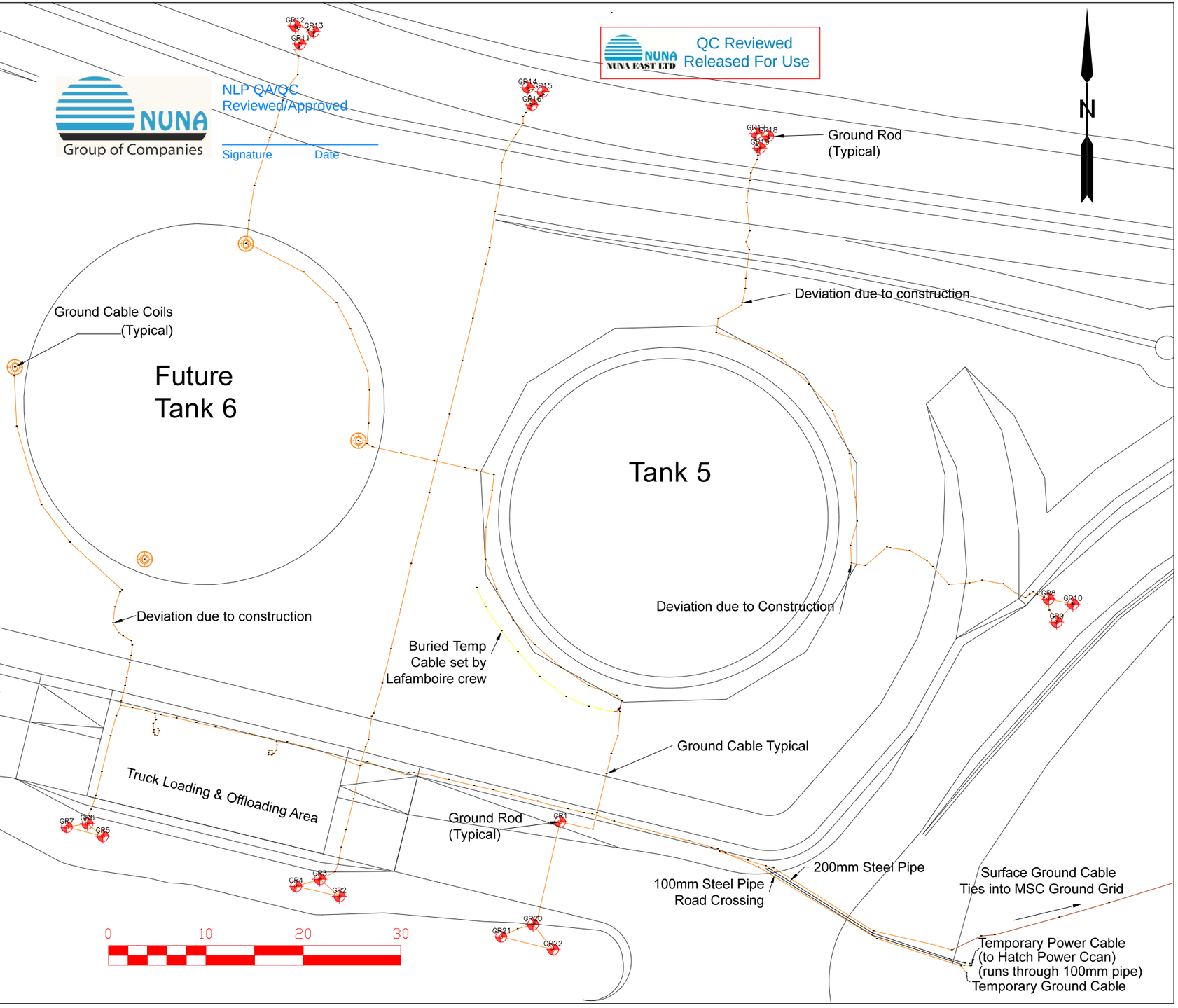
DRAWING NAME (YYMMDD):
SM-Redline 190806 MRTF Ground Grid.dwg

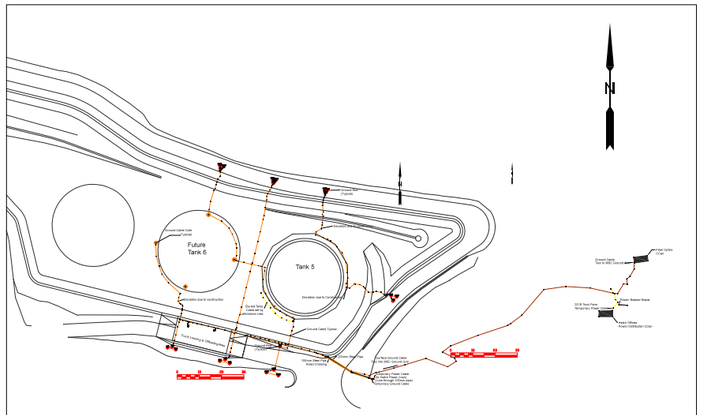
NUNA Group of Companies

NLP QA/QC Reviewed/Approved

Signature Date

NUNA EAST LTD QC Reviewed Released For Use





2019 Mary River Tank Farm Grounding Grid:
Grounding Grid buried inside farm & on surface east of steel pipe.
Ground Cables tie into the MSC Ground Grid at fiber optics Ccan.
Temporary Power Line runs through the 100mm steel pipe
& terminates at the Hatch Office Power Distribution Ccan.
Ground Rods (GR1-GR22) were drilled July 26/19 & Elevations
at top of installed ground rods were surveyed.

Rod ID	Northing	Easting	Top of Rod	Descrip
GR1	7913404.06	561117.79	189.48	Top Grou
GR2	7913396.42	561095.15	189.21	Top Grou
GR3	7913398.17	561093.14	190.35	Top Grou
GR4	7913397.45	561090.71	189.67	Top Grou
GR5	7913402.58	561070.87	189.82	Top Grou
GR6	7913403.87	561069.29	190.34	Top Grou
GR7	7913403.52	561067.16	189.75	Top Grou
GR8	7913426.92	561167.92	189.52	Top Grou
GR9	7913424.55	561168.76	189.66	Top Grou
GR10	7913426.39	561170.43	189.74	Top Grou
GR11	7913483.87	561091.10	187.84	Top Grou
GR12	7913485.73	561090.61	187.75	Top Grou
GR13	7913485.14	561092.51	187.79	Top Grou
GR14	7913479.39	561114.48	188.24	Top Grou
GR15	7913478.97	561116.02	188.23	Top Grou
GR16	7913477.62	561114.91	188.30	Top Grou
GR17	7913474.69	561137.94	188.82	Top Grou
GR18	7913474.42	561139.15	188.79	Top Grou
GR19	7913473.20	561138.30	188.74	Top Grou
GR20	7913393.52	561115.01	188.79	Top Grou
GR21	7913392.27	561111.74	188.84	Top Grou
GR22	7913390.96	561117.08	188.81	Top Grou

AS BUILT
NAME:
DATE:
ADCO SIGNATURE:

NOTES:
Ground Rods drilled & asbuilt July 26, 2019
xref files:AB 2019 MRTF Ground Rods.xml & .pdf
CAB 190903 MRTF Tk 5 & 6 Grnd Cables-Rods & Pipe Crossing.csv
Final Grade Design Lines
Ground Cable Coils at Future Tank 6
Ground Rod (Top of Rod)

Coordinate System:
UTM Zone 17 North
Nad 1983 (Canada)
Geoid HT2_0
Base Station: @ ID # Rebar-01
N 7913406.434
E 561204.787
Z 198.991

CLIENT: Baffinland Iron Mines Corporation

PROJECT: Mary River Expansion Project, Baffin Island, Nunavut

PREPARED BY:
Nuna East Ltd.
9839 - 31 Avenue
Edmonton, AB
T6N 1C5

DRAWN BY: mc

SCALE: barscale

DATE: Sept. 3, 2019

DRAWING TITLE:
Mary River Tank Farm Ground Grid & Rods Asbuilt 2019

DRAWING NAME (YYMMDD): CAB 190903 MRTF Tk 5 & 6 Grnd Cables-Rods & Pipe Crossing.dwg

Appendix B

Mary River Tank Farm Piping
E353004-CX001-130-124-0011
Job Book CVR-062

Appendix C

Contact Information as per Components 1 and 2 of the Commercial Lease Requirement

Company	Address	Contact Numbers
Hatch (Global Corporate Office) (EPCM Contractor)	Sheridan Science & Technology Park 2800 Speakman Drive Mississauga, ON L5K 2R7 Canada	Tel: 1-905-855-7600 Fax: 1-905-855-8270
Nuna East Limited	9839 – 31 Avenue NW Edmonton, AB T6N 1C5 Canada	Tel: 1-780-434-9114 Fax: 1-780-434-7758

Role	Name	Email
Preparer of Report	Glen Peace, P.Eng.	glen.peace@hatch.com
Responsible for Construction	Marlon Coakley	marlon.coakley@hatch.com
Baffinland Representative	Christopher Murray	Christopher.murray@baffinland.com

Appendix D

Map to show Construction in Relation to Lease Boundaries and Water Bodies

554,000
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562,000
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565,000
7,917,000
7,916,000
7,915,000
7,914,000
7,913,000
7,912,000
MINE SITE TANK FARM
0 20 40 Meters
KM 97
BORROW SOURCE
OPEN BURN
LOCATION
WASTE MANAGEMENT
BUILDING
HAZARDOUS WASTE BERM
SITE SERVICES
SHOP
HELICOPTER PAD
AERODROME
QMR2
WAREHOUSE
Camp
Lake
AIRSTRIP
ORE HAUL
TRUCK PAD
SAILIIVIK CAMP
MINE SITE
TANK FARM
MINE SITE
COMPLEX
LAYDOWN 2
Sheardown
Lake NW
LANDFILL
CRUSHER FACILITY
SURFACE WATER
MANAGEMENT POND
EMULSION
PLANT
EFFLUENT
DISCHARGE LOCATION
Sheardown
Lake SE
WASTE ROCK FACILITY
WATER TREATMENT PLANT
SURFACE WATER
MANAGEMENT POND
MS-08 DISCHARGE LINE
WASTE ROCK FACILITY
110 KM LAYDOWN AREA
ULTIMATE DEPOSIT 1
PIT LIMITS
HAUL ROAD
QUARRY
D1Q1
ACTIVE
MINING AREA
QUARRY
D1Q2
EXPLOSIVE
MAGAZINE
MARY RIVER
TRIBUTARY F
MARY RIVER

LEGEND

- Borrow Area
- Quarry Area
- Project Development Area
- Commercial Lease Boundary
- Current Infrastructure

MARY RIVER PROJECT

Mine Site Tank Farm

Projection: NAD 1983 UTM ZONE 17N.
Base Map: © 2019 Digital Global, Inc.
Imagery and Infrastructure are representative as of August 2019.

0 100 200 400 600 800 Meters
Scale 1:30,000
N

Baffinland

FIGURE 1