21 August 2018

Assol Kubeisinova
Technical Advisor, NWB
P.O. Box 119
Gjoa Haven, NU X0B 1J0

RE: Response to Comments
Milne Port Stockpile Water Management Upgrades - Modification Request No. 9
Mary River Project, Type 'A' Water Licence - 2AM-MRY1325 - Amend. No. 1

Baffinland Iron Mines Corporation (Baffinland) provides the attached responses to comments received from the Qikiqtani Inuit Association (QIA)[1] and Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)[2] regarding Water Licence Modification Request No. 9.

We trust that the attached responses provide additional clarification on the proposed work and infrastructure changes at the Project. Please do not hesitate to contact the undersigned should you have any remaining questions or comments.

Regards,

Christopher Murray
Environmental & Regulatory Compliance Manager

Attachments:

Attachment 1: Baffinland Response to Comments
Attachment 2: Port Site – Stockyard 2 – Northern Access Roads Plan and Profile (H353004-40000-223-271-0011-0001, Rev. 0)
Attachment 3: Borehole Report – BH16-M001

[1] QIA (2018) Re: Mary River Project – Milne Port Ore Stockpile Water Management Upgrades Modification Request No. 9. Water Licence 2AM-MRY1325. Letter dated July 31, 2018.
[2] CIRNAC (2018) Re: Crown-Indigenous Relations and Northern Affairs Canada's comments on Baffinland Iron Mines Corporation's Modification Request No. 9 – Milne Port Ore Stockpile Water Management Upgrades (Water Licence 2AM-MRY1325 - Amendment No. 1). Letter dated August 3, 2018.

Cc: Karén Kharatyan (NWB)
Fai Ndofor, Sean Joseph (QIA)
Sarah Forte, Bridget Campbell, Ian Parsons (CIRNAC)
Grant Goddard, Megan Lord-Hoyle, Tim Sewell (Baffinland)

Attachment 1

Baffinland Response to Comments

Table 1-1: Baffinland Response to QIA and CIRNAC Comments RE: Modification Request No. 9

ID	Comment	Baffinland Response
	QIA Comments	
1	Baffinland to follow the As Built Operations Guide, further detailing expectations of Article 6.4 item c) of the Lease when preparing the As Built Report/Construction Summary Reports for the Settling Ponds. The As Built Report should summarize all considerations in Section 6 of the Civil Design Report prepared by HATCH. This does not limit Baffinland's requirements to Part D, item 17 of the Water Licence.	Baffinland will prepare a Construction Summary Report ninety (90) days following completion of the Milne Port Ore Stockpile Water Management Upgrades. It is noted that Baffinland is required to provide available As Built documentation to the QIA, and that a Draft Lease Operations Guide is currently under review at the time of this submission.
2	Baffinland to provide the source for construction materials.	Material used for construction will be either clean waste rock or quarry material from approved sources.
3	Baffinland to provide detailed for construction drawings for the two new culvert crossings installed beneath access roads in addition to the existing culvert.	Construction details for the two new culverts are outlined in the Issued-for-Construction Drawing: Port Site - Stockyard 2 Northern Access Roads Plan and Profile (H353004-40000-223-271-0011-0001, Rev. 0), developed by Hatch and provided as Attachment 2 of this submission.
4	Baffinland to provide the borehole log and precise location with respect to proposed facilities for Borehole BH 16-M001.	The borehole report for BH16-M001 is provided as Attachment 3 of this submission. UTM coordinates are provided in the borehole report.
5	Baffinland to provide the quantities and the physical characteristics of construction materials.	Section 6.2 of the Hatch design brief indicates the types of materials to be used. Quantities of construction material is not relevant to the constructability of the structure or are a required detail for a Water Licence Modification.
6	Baffinland to provide a slope stability analysis to demonstrate stability of the new compartments.	The Hatch design brief confirms that slope angles of 1V:3H are appropriate, as they were used for the existing ponds and have performed well.
7	Baffinland to provide an Operations, Maintenance, and Surveillance (OMS) Manual/Plan. The OMS should provide detailed instrumentation and monitoring plans, including but not limited to sampling locations, parameters measured, and frequencies of sampling to be carried out.	An OMS Manual/Plan is not required for this structure. Monitoring of the existing and expanded surface water management structures at Milne Port is captured in the Project's Surface Water and Aquatic Ecosystems Management Plan (BAF-PH1-830-P16-0026) and Fresh Water Supply, Sewage and Wastewater Management Plan (BAF-PH1-830-P16-0010). Management plans are routinely updated to reflect infrastructure changes and upgrades.
8	Baffinland to provide the temporary water management plan described in Section 6.1 of the Civil Design Report fifteen (15) days prior to construction, for review by QIA.	Consistent with Section 6.1 of the Civil Design brief, a temporary water management plan will be prepared. QIA will be provided with a copy prior to construction.
9	Baffinland to provide detailed instrumentation and monitoring plans, including but not limited to sampling locations, parameters measured, and frequencies of sampling to be carried out. This item would be included in the OMS.	An OMS Manual/Plan is not required for this structure. Monitoring of the existing and expanded surface water management structures at Milne Port is captured in the Project's Surface Water and Aquatic Ecosystems Management Plan (BAF-PH1-830-P16-0026) and Fresh Water Supply, Sewage and Wastewater Management Plan (BAF-PH1-830-P16-0010). Management plans are routinely updated to reflect infrastructure changes and upgrades.
10	Baffinland to provide prior to construction, construction QA/QC specifications and geomembrane installation specifications required to ensure the construction is completed according to the design intent and to an acceptable standard. Specifically, the design is missing a quality assurance and quality control for material placements, construction density and water content requirements. Specifications are to be signed and stamped by a Professional Engineer. The results of said QA/QC monitoring and installation data are to be provided in the construction summary report.	Baffinland will employ industry best practices and where applicable develop construction QA/QC plans. Baffinland will provide 'a comparison of measured versus predicted performance of infrastructure' in the associated construction summary report as outlined in Schedule D of the Type 'A' Water Licence. Baffinland maintains that where the Type 'A' Water Licence 2AM-MRY1325 or other applicable legislation do not explicitly state as such, the construction of infrastructure associated with the Project remains the sole responsibility and liability of Baffinland Iron Mines Corporation. Baffinland retains third party expert engineering design to develop and construct mine infrastructure in a manner consistent with industry best practices, that is sustainable, and is safe for employees and the environment.

Table 1-1: Baffinland Response to QIA and CIRNAC Comments RE: Modification Request No. 9

ID	Comment	Baffinland Response
11	Baffinland to acknowledge that any water released into the marine environment is a violation under the Fisheries Act.	Baffinland disputes this claim. The Fisheries Act prohibits the deposit of a deleterious substance. Water does not constitute a deleterious substance. Furthermore, Baffinland is authorized to discharge into the marine environment under the Type 'A' Water Licence 2AM-MRY1325.
12	The Civil Design Report prepared by HATCH is to be signed and stamped by a Professional Engineer with a Northwest Territories and Nunavut Associations of Professional Engineers and Geoscientists Permit to Practice.	Baffinland is not required to provide design briefs that are signed and stamped by a professional engineer, as this only applies to drawings under Part D, Item 2 of the Type 'A' Water Licence 2AM-MRY1325.
13	Baffinland to provide a volume balance to demonstrate the Settling Ponds have sufficient storage capacity and contingency volume.	Section 5.5 of the Hatch design brief provides the capacity of the ponds relative to the required capacity based on a 1:10 year, 24 hour precipitation event.
14	Baffinland to provide the environmental inspection forms and a complete environmental monitoring program for review. Results should be included in the as- built construction report.	Environmental monitoring is outlined in the Project's Surface Water and Aquatic Ecosystems Management Plan (BAF-PH1-830-P16-0026) and Fresh Water Supply, Sewage and Wastewater Management Plan (BAF-PH1-830-P16-0010). Results of environmental monitoring will be included in the Construction Summary Report and in the QIA/NWB Annual Report.
CIRNAC Comments		
1	During construction of the existing Pond 2, high moisture content soils were encountered. The high density polyethylene liner could not be appropriately installed on saturated soils. To accommodate for this issue, the pond bottom elevation was raised 1.4 m above the intended design depth. The size of the pond was reduced by approximately ¾, resulting in a constructed pond capacity that is approximately ¼ of the original intended capacity. In Section 6.1 - Construction and Operating Considerations of the Civil Design Report (Hatch, 2018) provided, CIRNAC notes that in the event ground water is encountered, Baffinland's engineer must be informed and the design will be adjusted accordingly. Any difficulties due to the high groundwater table are intended to be addressed by constructing the invert levels of the proposed ponds to the same depths as those of the existing ponds. Since the groundwater table is typically a subdued expression of topography, if the terrain at the expansion pond locations was similar to that of the existing ponds, the proposed mitigation measure would be adequate, which is the case for Pond 2a. However, it appears Pond 1 was principally constructed on the side of a hill and the proposed Pond 1a will have to be partly cut into the same hill. Encountering the water table during the construction of Pond 1a is a possibility given the need to excavate several meters into the hillside. CIRNAC's concern here is that if Pond 1a cannot be constructed as designed, the pond's capacity will be undersized for the area drained, which can increase the likelihood of non-compliant discharge. **Recommendation:** CIRNAC recommends Baffinland to field check the construction through a qualified Engineer in order to ensure that the project specifications and quality control measures are followed. Also, CIRNAC recommends that Baffinland either confirm with site testing if building Pond 1a in the location proposed is feasible or propose other mitigation measures should groundwater be encountered before the intended pond depth.	Baffinland acknowledges the challenges faced during the construction of the existing Pond 2 at Milne Port. In their design, Hatch has addressed these challenges and indicated that the new ponds will be constructed to the same invert levels as the existing ponds to mitigate construction challenges associated with the presence of groundwater. Should groundwater be encountered during construction the design will be adjusted accordingly to ensure that adequate storage capacity is maintained. To further mitigate uncertainty with regards to the presence of groundwater, test pitting will be carried out along the footprint prior to any fill placement, if ground conditions permit. Baffinland will prepare as built documentation and a construction summary report signed and stamped by a Professional Engineer registered in Nunavut, consistent with Part D, Item 2 of the Type 'A' Water Licence 2AM-MRY1325.

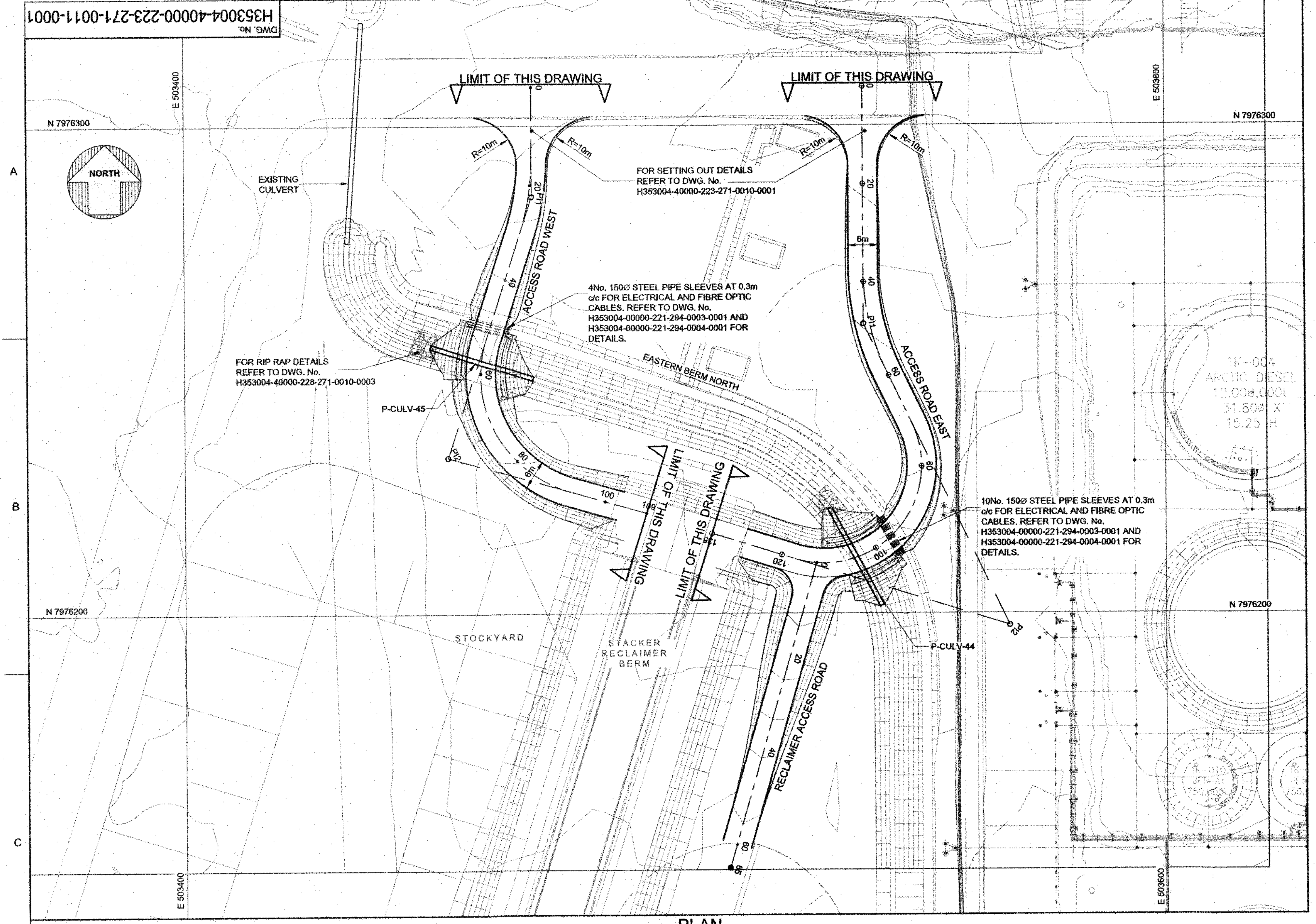
Table 1-1: Baffinland Response to QIA and CIRNAC Comments RE: Modification Request No. 9

ID	Comment	Baffinland Response
2	The perimeters of the proposed settling pond compartments are less than thirty one metres (31m) from the marine environment. Although salt water bodies are outside of the jurisdiction of the Water Board and outside of the scope of the current Type A water licence, Baffinland should be aware that CIRNAC Water Resource Officers have the authority to report on, and to enforce, the *Arctic Waters Pollution Prevention Act* .	Thank you, this is noted.

Attachment 2

Port Site – Stockyard 2 – Northern Access Roads Plan and Profile

(H353004-40000-223-271-0011-0001, Rev. 0)



PLAN
SCALE 1:500

SETTING OUT DATA-RECLAIMER ACCESS ROAD

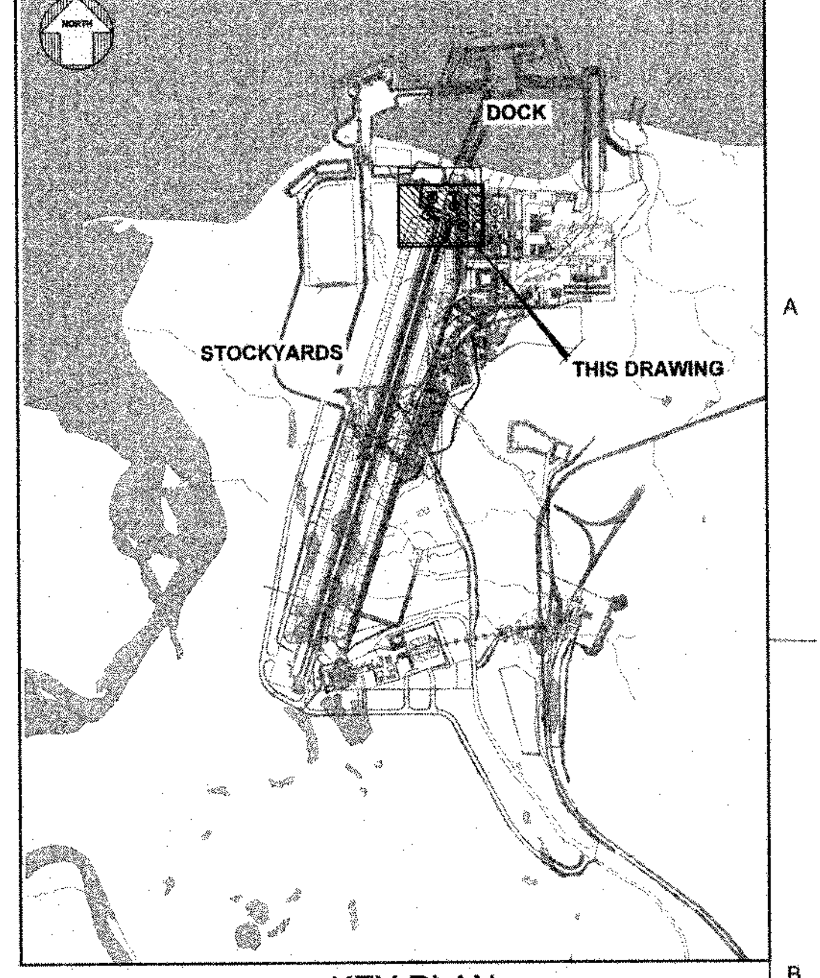
NAME	CH	E	N	DETAILS
START	0.000	503528.641	7976210.298	L 65.000m
END	65.000	503510.764	7976147.804	L 0.001m

SETTING OUT DATA-RECLAIMER ACCESS ROAD - WEST

NAME	CH	E	N	DETAILS
START	0.000	503470.902	7976307.871	L 14.601m
BCC1 PI1 ECC1	14.601 30.032	503470.872 503470.855 503468.477	7976293.270 7976285.493 7976278.088	R 50.000m DA 17°41'00" TL 7.777m AL 15.431m
BCC2 PI2 ECC2	52.554 92.671	503461.591 503453.685 503478.562	7976256.644 7976232.021 7976224.952	R 25.000m DA 91°56'30" TL 25.862m AL 40.117m
END	106.751	503494.029	7976220.558	L 16.080m

SETTING OUT DATA-RECLAIMER ACCESS ROAD - EAST

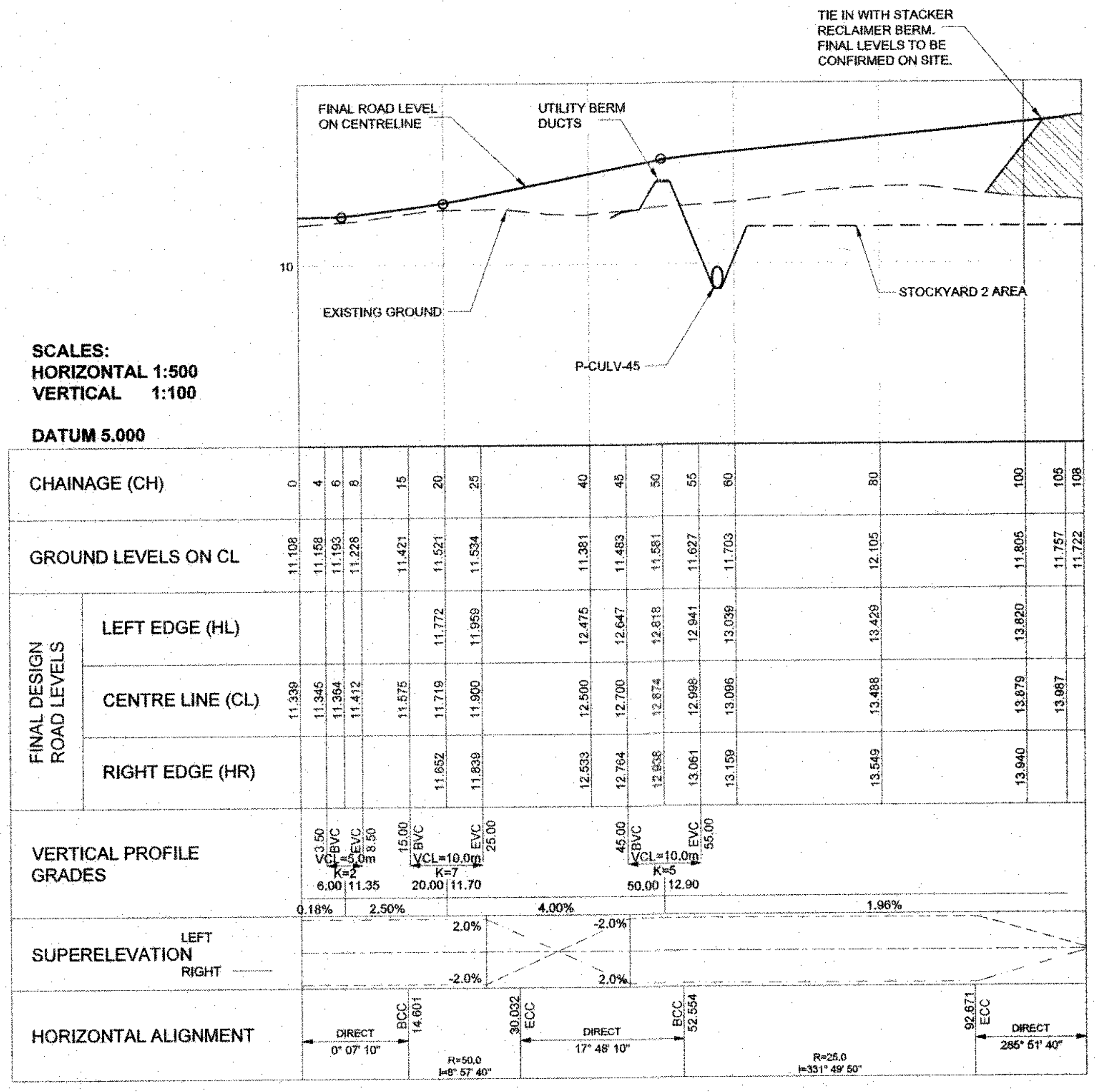
NAME	CH	E	N	DETAILS
START	0.000	503538.441	7976307.871	L 37.229m
BCC1 PI1 ECC1	37.229 59.579	503538.441 503538.441 503543.353	7976270.642 7976259.277 7976249.029	R 50.000m DA 25°36'40" TL 11.365m AL 22.350m
BCC2 PI2 ECC2	70.830 117.229	503548.217 503568.063 503524.230	7976238.884 7976197.482 7976211.144	R 20.000m DA 132°55'20" TL 45.913m AL 46.399m
END	134.901	503507.358	7976216.403	L 17.673m



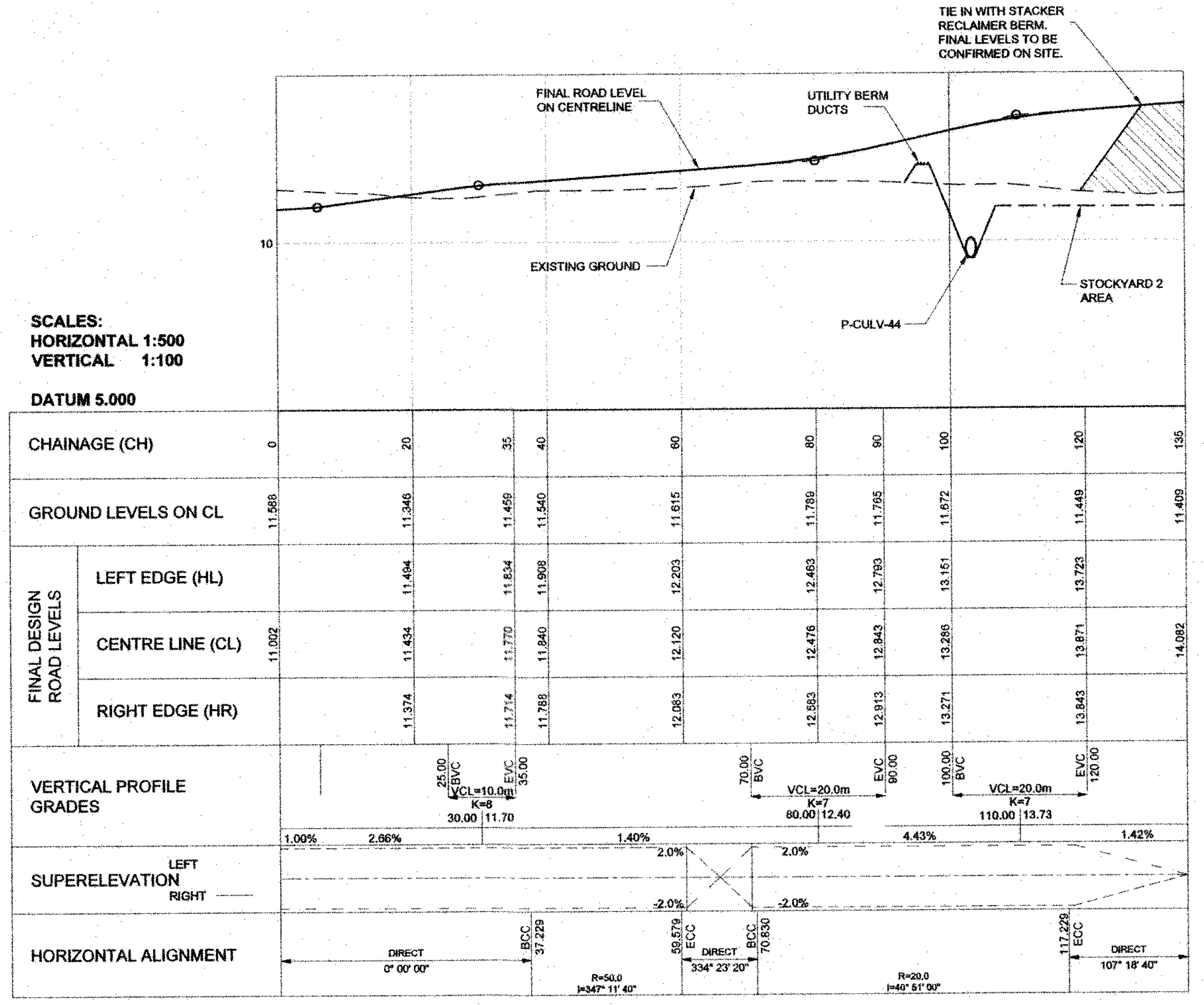
KEY PLAN

CULVERT SCHEDULE
(THIS SCHEDULE TO BE READ IN CONJUNCTION WITH DRG. No. H353004-00000-221-294-0001-0001-TYPICAL CULVERT DETAILS)

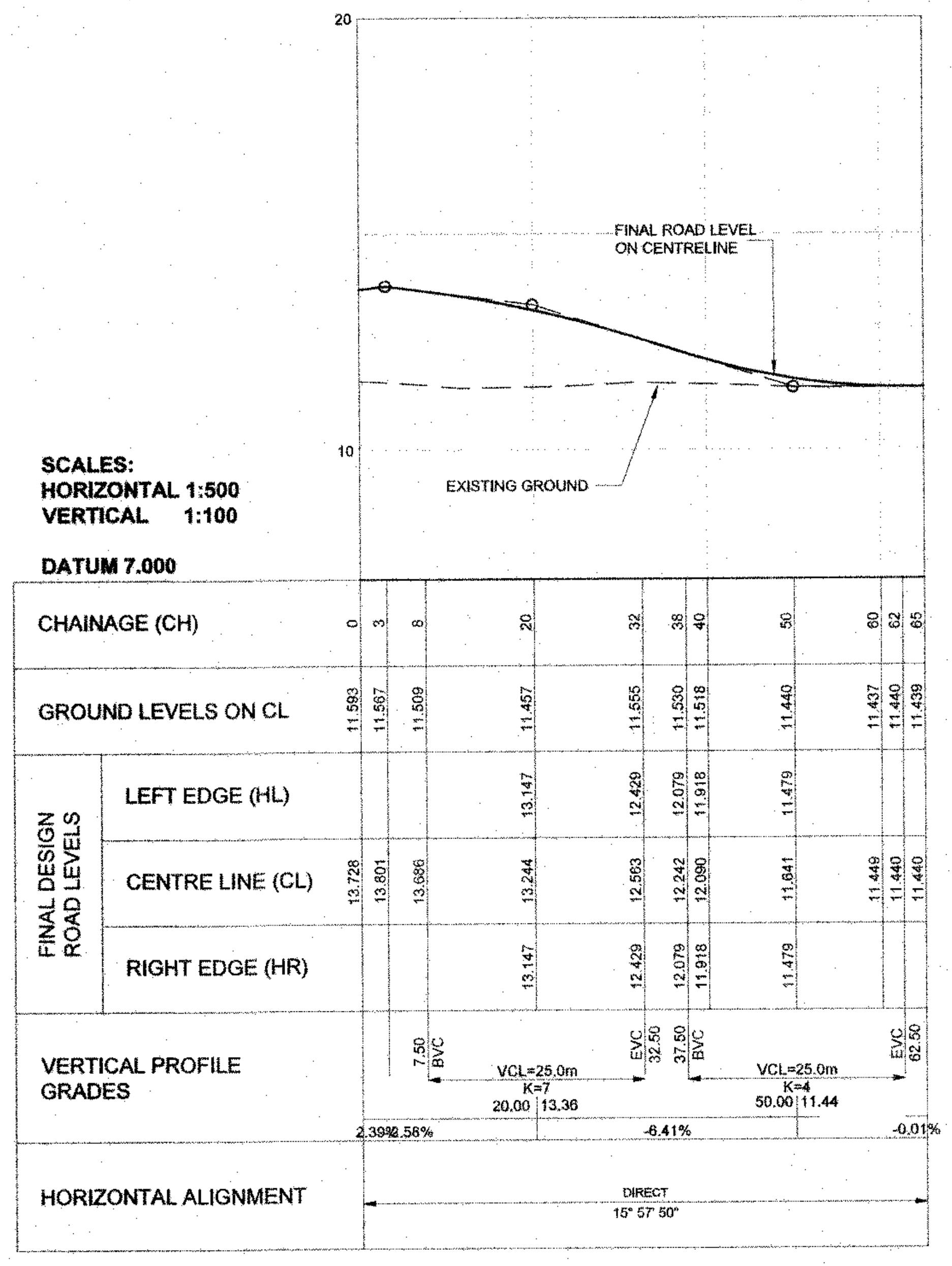
								CULVERT AT UPSTREAM				CULVERT AT DOWNSTREAM				NOTE: FINAL U/S INVERT AND D/S INVERT LEVELS ARE TO BE CONFIRMED ON SITE			
CULVERT ID	FISH BEARING	NUMBER OF PIPES	D (mm)	LENGTH (m)	E (mm)	W (mm)	TYPE	NORTHING	EASTING	U/S INV. ELEV (m)	RIP RAP REQ'D	NORTHING	EASTING	D/S INV. ELEV (m)	RIP RAP REQ'D	C (mm)	L (m)	S (%)	SKEW (DEGREE)
P-CULV-44	N	1	900	22.54	0	900	CSP	7976201.604	503542.015	9.497	N	7976221.463	503531.367	9.452	Y	500	3.6	0.20	10
P-CULV-45	N	1	900	21.96	0	900	CSP	7976248.219	503471.058	9.317	N	7976254.910	503450.146	9.274	Y	500	3.6	0.20	18



RECLAIMER ACCESS ROAD - WEST
CH 0.000 TO CH 108.000



RECLAIMER ACCESS ROAD - EAST
CH 0.000 TO CH 134.901



RELAIMER ACCESS ROAD
CH 0 TO CH 65

NOTES:

1. LIDAR SURVEY PROVIDED BY PHOTSAT (2016)
2. CO-ORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METERS.
3. CONTOURS ARE IN METERS. CONTOUR INTERVAL IS 0.5m.
4. ALL DIMENSIONS SHOWN ARE IN METERS, UNLESS NOTED OTHERWISE.
5. FOR TYPICAL CROSS-SECTION DETAILS REFER TO THE PRIMARY ROAD SECTION ON DRAWING No. H353004-40000-221-273-0001-0001
6. SAFETY BERMS, 1m HIGH, TO BE CONSTRUCTED OVER THE ENTIRE WIDTH OF DITCH ON BOTH SIDES OF THE ROAD. FOR DITCH DETAILS REFER TO DRAWING No. H353004-40000-271-0010-0003.

CULVERT SCHEDULE LEGEND:

D	CULVERT DIAMETER
E	EMBEDMENT DEPTH
C	CULVERT SPACING AND BEDDING CLEARANCE C = 500 WHILE D > 900mm C = 300 WHILE D < = 900mm
W	CULVERT BACKFILL TOP WIDTH W = (n*D) + (n-1)*C n = no. of pipe/culvert
TYPE	CULVERT MATERIAL
U/S INV.	CULVERT UPSTREAM INVERT ELEVATION
D/S INV.	CULVERT DOWNSTREAM INVERT ELEVATION
L	RIPRAP APRON LENGTH L = 4xD (APPROX)
S	CULVERT SLOPE
LENGTH	CULVERT LENGTH
CSP	CORRUGATED STEEL PIPE

PERMIT TO PRACTICE
HATCH LTD.
Signature
Date 2018-06-25
PERMIT NUMBER: P 512
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

DRAWING No.	DRAWING TITLE
H353004-00000-221-294-0001-0001	TYPICAL CULVERT DETAILS
H353004-40000-221-273-0001-0001	TYPICAL CROSS SECTION DETAILS
H353004-40000-221-271-0003-0001	STOCKPILE 2 - STACKER RECLAIMER BERM
H353004-40000-228-271-0010-0003	STOCKPILE 2 - EASTERN BERM PLAN AND PROFILE SHEET 3 OF 3

REFERENCE DRAWINGS

L.247
R. A. HALIM
LICENSEE
2018-06-25
NWT/NU

REG. PROFESSIONAL

FOR CONSTRUCTION

No.	DESCRIPTION	BY	CHK'D	DATE
0	APPROVED FOR CONSTRUCTION	KVDM	FH	14/06/2018

REVISIONS

HATCH

ROLE	NAME	SIGNATURE	DATE
DRAFTSPERSON	K VAN DER MERWE	NR	14/06/2018
DESIGNER	H HERBST	NR	14/06/2018
CHECKER	F HUGO		2018-06-21
DESIGN COORD.	R GOOSEN		2018-06-21
RESP. ENG.	R HALIM		2018-06-25
LEAD DISC. ENG.	A GROBBELAAR		2018-06-25
AREA LEAD	V LAVRIC	V Lavric	2018-06-25
ENG. MANAGER	D STANGER		2018-06-25
AREA MANAGER	T ATIBA		2018-06-26

DRAWING APPROVAL STATUS: Approved for Construction

Baffinland

BAFFINLAND IRON MINES LP
MARY RIVER EXPANSION PROJECT

PORT SITE - STOCKYARD 2
NORTHERN ACCESS ROADS
PLAN AND PROFILE

SCALE 1:500 OR AS NOTED
DWG. No. H353004-40000-223-271-0011-0001
REV 0
SHEET SIZE: E

$USERNAMES $DATES $FILES $TIMES

Attachment 3

Borehole Report – BH16-M001

HATCH BOREHOLE REPORT

BH16-M001

Sheet 1 of 1

Client: Baffinland Iron Mines
Project: Mary River Expansion Study Stage 2
Location: Milne Inlet (Reclaimer Berm)

Project No.: H352034
Datum: NAD83
Platform: Ground

Easting: 503,504.0 m
Northing: 7,976,237.0 m
Surface Elevation: 12.75 m
Bottom Elevation: -2.45 m
Total Depth: 15.2 m
Logged By: MR
Reviewed By: SH/WH

Contractor: Boart Longyear
Driller: Michael Scott
Rig Type/ Mounting: MiniSonic Rig
Hole Diameter (mm): 96
Date Logged: 12/8/2016
Date Reviewed: 2/10/2017

Water	Elevation (m)	Depth (m)	Method	Casing	Graphic Log	Soil Description	Moisture Condition	Consistency/ Density	Sample Type	Recovery %	Blows	Moisture Content Profile (0 / 50 / 100)	Field Water Content	Percent Gravel	Percent Sand	Percent Fines	Liquid Limit	Plastic Index	Other Tests
Unobserved due to Permafrost	10.8	2.0	Vibracore	H-Casing		GRAVELLY SAND, trace COBBLES: Light brown to grey, fine to medium grained sand, rounded to subangular gravel	D												
						1.50 m to 2.00 m: Trace gravel and silt, rounded gravel	M						18						
	8.8	4.0											18						
						4.60 m to 6.10 m: Trace silt													
	6.8	6.0				6.10 m to 9.10 m: Some silt, fine to coarse grained sand							19	0	82	17			
													16						
	4.8	8.0											16						
						9.10 m to 10.60 m: Some gravel													
	2.8	10.0											16						
						10.60 m to 12.10 m: With gravel, trace excess ice							16						
	0.8	12.0				12.10 m to 13.70 m: Trace gravel and silt, rounded to subangular gravel							18						
	-1.3	14.0				13.70 m to 15.20 m: Some silt, some gravel													
				[15.2]									16						
	-3.3	16.0				To Target Depth. **Drillhole BH16-M001 terminated at 15.2m.**													
	-5.3	18.0																	
	-7.3	20.0																	

Notes: