Photograph CD-1826: From Sta 40+770/-27 m, looking NE. Placement of a 0.5 m thick lift of coarse filter from El. 143 m to 143.5 m with an excavator from Sta. 40+730 m to 0+ 775 m.

Photograph CD-1827: From Sta 0+940/-16 m, looking SW. Placement of a 0.5 m thick lift of fine filter from El. 143 m to 143.5 m with an excavator from Sta. 40+730 m to 0+ 835 m.

Photograph CD-1828: From Sta 0+410/-22 m, looking N. Defrosting of the deposition finger materials with two Frost Fighters at Sta. 0+390 m.

Photograph CD-1829: From Sta 0+410/-22 m, looking N. Placement of a 0.5 m thick lift of coarse filter from El. 143 m to 143.5 m with an excavator from Sta. 0+170 m to 0+460 m and placement of a 0.5 m thick lift of fine filter from Sta. 0+170 m to 0+380 m.

Golder Associates Ltd.

REGISTERED PROFESSIONAL ENGINEER
Y. BOULIANNE
LICENSEE
2018-05-07
NT/NU

Marion Habersetzer, M. Sc.
Mine Waste Group

Yves Boulianne, P.Eng.
Associate, Senior Geotechnical Engineer

Marion Habersetzer
for: Samuel Barbeau
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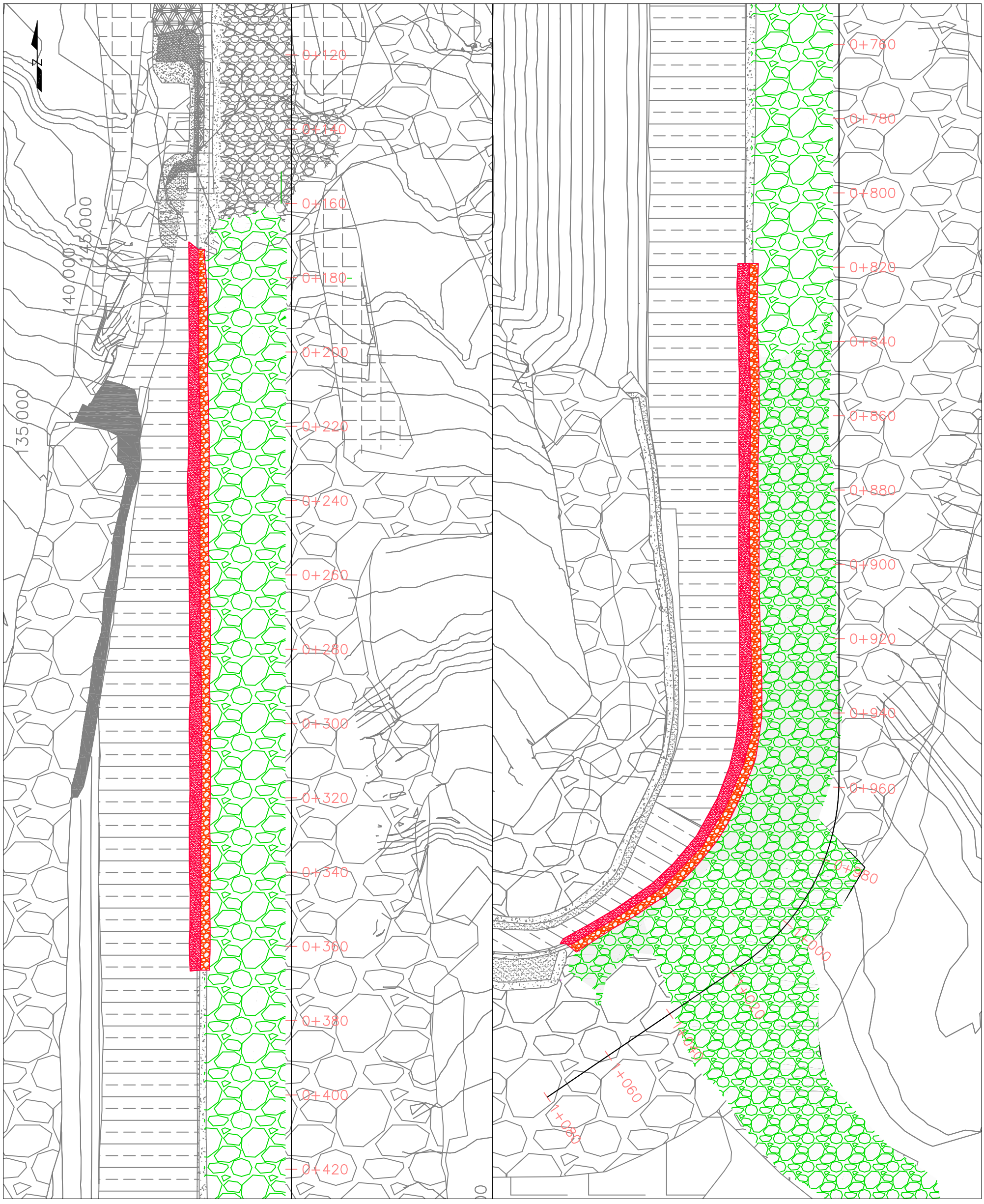
MH/YB/it

Attachments: Construction Progress Drawings from AEM as of 6 May 2018

https://golderassociates.sharepoint.com/sites/1897439/preparation of deliverables/weekly reports/2018-04-30 to 2018-05-06/1897439-1577-tm-rev0 qa weekly report 2018-04-30 to 2018-05-06.docx

PERMIT TO PRACTICE
GOLDER ASSOCIATES LTD.
Signature
Date 2018-05-07
PERMIT NUMBER: P 049
NT/NU Association of Professional Engineers and Geoscientists

DAILY PROGRESS
CENTRAL DIKE AND SD5
CONTRACT # 11-505



VOLUMETRY DETAIL

06-05-2018 - COARSE FILTER : 524.28m³
06-05-2018 - FINE FILTER : 513.25m³

KIVALLIQ CONTRACTORS GROUP LTD

PREPARED BY : MIKAËL LÉVESQUE
DATE : 06-05-2018
CON-QT-016-CD_DP_060518

QA WEEKLY REPORT

DATE May 14th 2018 1897439-1577-TM-Rev0

TO Patrice Gagnon, Pier-Éric McDonald
Agnico Eagle Mines Ltd, Meadowbank Division

CC Frédérick Bolduc, Alexandre Lavallée

FROM Samuel Barbeau **EMAIL sbarbeau@golder.com**

QA WEEKLY REPORT FROM MAY 7TH TO MAY 13TH – TSF SOUTH CELL CONSTRUCTION MEADOWBANK (1897439)

This document summarizes QA activities performed by Golder from May 7th to 13th, 2018 inclusively, related to the construction activities of Saddle Dams 3 (SD3) and Central Dike (CD) at the Meadowbank mine site.

Unless otherwise specified, the construction activities use the centreline of the structures for a dike crest elevation of 150 m for reference (refer to the Drawings). The description of activities refers to the stations and offsets from the centreline (e.g., Sta. 0+500/-50 m). The "+" and "-" symbols indicate the location of the work downstream and upstream of the centreline, respectively.

1.0 GOLDER PERSONNEL ON SITE

Golder personnel on site during this reporting period is summarized in Table 1.

Table 1: Golder Personnel on Site

Name	Comments
Samuel Barbeau	QA Manager (on site since April 30th)

2.0 HEALTH AND SAFETY

H&S meetings were held with AEM and FGL/SANA during the daily construction meetings. Minutes from these meetings are recorded and stored in Golder's on-site office. The key H&S elements for the reporting period were as follows:

- Cold weather and ice: apply caution when driving or walking on icy surfaces, wear appropriate clothing.
- Dust is still an issue on the construction field; be vigilant by staying out of the dust cloud near construction activities and road circulation.

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- The fog causes a visibility issue on the roads and on the dikes. Reduce driving speed and keep safety distances between vehicles, call on the radio when entering Central Dike.
- Coactivity on the dikes: be aware of blind spots and safe spots, keep good communication and visual contact with the operators. It is recommended to call on the radio when entering Central Dike on either side when heavy equipment is working in the area.
- An artic fox was spotted on Central Dike near the equipment. Operators were advised of the presence of the fox and used extra caution.
- Fresh snow layers make surfaces slippery: apply caution when driving or walking on snowy surfaces.
- The snow bank at the intersection of the saddle road and the west road blocked the views when driving southbound on the west road going toward the saddle road. The snow bank was corrected with a loader.

3.0 SUMMARY OF MAIN DISCUSSIONS IN CONSTRUCTION MEETINGS

Construction meetings were held daily during the reporting period and were attended by the QA Manager. The following items were discussed:

General

- The QA manager reiterated the need to receive the Surveyor's daily report as the quantities are required to determine when to sample the coarse and fine filters.
- The QA manager reiterated the need to bring a portable nuclear gauge (PNG) on site for the QC program.
- Following discussion with AEM, the samples numbers were modified to follow the sequential number of the previous years.

Central Dike

- Six passes of compactor were needed for the compaction of the first lift of coarse and fine filters at El. 143.5 m on Central Dike to achieve the maximum compaction (assessed visually). No watering of the filter materials was possible as water would have frozen inside the lift. The compaction was followed closely by the QC and QA personnel. Compaction of the filters is not optimal. However, the placed filter materials are not expected to settle significantly and will provide a good foundation for the geosynthetics.
- The removal of the material on the four deposition fingers to expose 1 m of liner is complete. Only the first deposition finger materials at approx. Sta. 0+390 m were heated before their removal. It was noticed that the materials could be easily removed without heating, since a protection layer (Teranap) had been put in place prior to the construction of the deposition finger.
- Punctures were noticed on the top of the LLDPE liner around the four deposition fingers which were removed with the excavator. The holes all seem to be located above El. 142 m, where the horizontal extrusion weld for the raise of the liner is planned to be done. An inspection to assess the damages to the LLDPE liner on the upstream slope of Central Dike will be performed by the QA Manager.
- The QC personnel mentioned that the compactor was slightly tilted while compacting the fine filter. SANA's foreman reviewed how to compact the filters uniformly with the compactor operator.

- The QA manager reiterated that the compaction of the filters must be done on the same day as the placement to prevent the filter materials from freezing before compaction. On May 9th, a section of the third lift was placed but not compacted. The compactor operator had left the construction site. The foreman had to operate the compactor to complete the second lift but did not have the time to compact the section of the third lift on the same day as the placement.
- An approx. 50-100 mm thick strip of snow had accumulated locally on the upstream side of the first lift of fine filter at elevation 143.5 m, near Sta. 40+750 m. The QA manager required that the snow be removed with an excavator before placing the second 0.5 m thick lift of fine filter from El. 143.5 m to 144 m.
- The placement, compaction, and profiling of the four lifts of coarse and fine filter from Sta. 0+170 m to 40+730 m at El. 143 m to El 145 m are completed.
- The fine filter upstream surface was rolled in preparation for the LLDPE liner installation.
- The QA manager required that the LLDPE geomembrane crest anchoring trench be re-excavated from Sta. 40+730 m to 0+830 m, as it was shallower and less wide than intended in the design.

Saddle Dam 3

- As the compacted sieved till (Type 1) stockpile is expected to remain frozen until August approximately, AEM asked if fine filter material (0-20 mm) mixed with 6% bentonite by mass and one layer of geotextile on the LLDPE liner could replace the compacted sieved till of the SD3 upstream toe liner tie-in, as it is planned to replace the compacted sieved till of the erosion protection layer.

  Following discussions with the Designer, the QA manager reiterated that the compacted sieved till class was required for the upstream toe liner tie-in for the following reasons:

  - The low permeability required for that part of the design may not be as homogenous as it should be with bentonite amended fine filter.
  - It is planned that water will be directly ponding on the SD3 toe liner tie-in. Last year, it was expected that the water elevation in summer 2018 would reach 142 m. If AEM has revised his water management plan, the Designer would require the details of the water management plan and a confirmation that the dike would never be raised to El. 150 m.
  - With the possibility of a raise of the south cell if the in-pit deposition plans are delayed, the water level could increase significantly and pond against the unprotected LLDPE liner.
- Following discussion with AEM, the SD3 toe liner tie-in is expected to be built in August approximately, as the compacted sieved till (Type 1) stockpile is expected to remain frozen until then.

  Following discussion with AEM, options were considered to replace the low quality till of the protection cover for the LLDPE geomembrane on SD3, as the low quality till is also expected to remain frozen until August approximately. AEM asked whether the low quality till could be replaced by coarse filter material or by fine filter material (0-20 mm) mixed with 6% bentonite by mass. The question was forwarded to the Designer.
- Regarding the raise of the protection layer on SD3, the QA manager asked for an update on the planned water level in the TSF South Cell.

Follow up

- Evaluate the LLDPE liner damages on the upstream slope of Central Dike.
- Inspect the LLDPE rolls stored on trailers outside once the snow has melted.
- Make a decision regarding the design changes to apply to the SD3 LLDPE liner protection cover.

4.0 SUMMARY OF CONSTRUCTION ACTIVITIES AND TEST RESULTS

Periodic QA inspections to monitor the construction activities and progress were performed by the QA Manager; these are summarized in the tables below.

Table 2: QA Observations for Saddle Dam 3

Activity or Area	Comments
Saddle road	■ Snow removal on saddle road.

Table 3: QA Observations for Central Dike

Activity or Area	Comments
Upstream	■ Removal of the materials covering the 4 deposition fingers with an excavator and hand shovels at Sta. 0+390 m, 0+520 m, 0+660 m and 0+800 m. ■ Placement of a first 0.5 m thick lift of coarse filter from El. 143 m to 143.5 m with an excavator from Sta. 0+170 m to 40+730 m. The material visually seemed well graded and of good quality. ■ Placement of a first 0.5 m thick lift of fine filter from El. 143 m to 143.5 m upstream of the coarse filter with an excavator from Sta. 0+170 m to 40+730 m. The material visually seemed well graded and of good quality. ■ Compaction of the first 0.5 m lift (approx.) of fine and coarse filters material at El. 143.5 m with a 10-tonne smooth-drum compactor with vibration (6 passes) from Sta. 0+170 m to 40+730 m. ■ Placement of a second 0.5 m thick lift of coarse and fine filters from El. 143.5 m to 144 m with an excavator from Sta. 0+170 m to 40+730 m. The materials visually seemed well graded and of good quality. ■ Compaction of the second 0.5 m lift (approx.) of fine and coarse filters material at El. 144 m with a 10-tonne smooth-drum compactor with vibration (4 passes) from Sta 0+170 to 40+730 m.

	■ Placement of a third 0.5 m thick lift of coarse and fine filters from El. 144 m to 144.5 m with an excavator from Sta. 0+170 m to 40+730 m. The materials visually seemed well graded and of good quality. ■ Compaction of the third 0.5 m lift (approx.) of fine and coarse filters material at El. 144.5 m with a 10-tonne smooth-drum compactor with vibration (4 passes) from Sta. 0+170 m to 40+730 m. ■ Placement of a fourth 0.5 m thick lift of coarse filter from El. 144.5 m to 145 m with an excavator from Sta. 0+170 m to 40+730 m. The material visually seemed well graded and of good quality. ■ Profiling of the upstream slope (2H:1V) from El. 143 to 145 m with an excavator between Sta. 0+170 m and 40+735 m. The removed material was placed with material from the fine filter stockpile on the fourth 0.5 m thick lift of fine filter from El. 144.5 m to 145 m upstream of the coarse filter with an excavator from Sta. 0+170 m to 40+730 m. ■ Compaction of the fourth 0.5 m lift (approx.) of fine and coarse filters material at El. 145 m with a 10-tonne smooth-drum compactor with vibration (4 passes) from Sta 0+170 m to 40+730 m. ■ Final rolling of the upstream slope in view of the LLDPE geomembrane installation from Sta. 0+170 m to 40+730 m. ■ Excavation of the LLDPE geomembrane crest anchoring trench from Sta. 40+730 m to 0+830 m.
Downstream	■ Profiling of the downstream slope (1.5H:1V) from El. 143 to 145 m with an excavator between Sta. 0+440 m and 0+530 m and between Sta. 0+745 m and 0+835 m.

5.0 FOUNDATION APPROVALS

No foundation approval was carried out during the reporting period.

Table 4: Details of the Foundation Approvals

Name	Structure	Sta. and Offset	Date of Approval	Comment

6.0 SAMPLING, LABORATORY, AND FIELD TESTING

Table 5 and Table 6 present the samples collected or tested by the QA and QC as well as PNG field results.

Table 5: Samples Taken by the QC

Sample ID	Date Sampled	Date Tested	Fill Material Type	Location (Station/Offset Elevation)	Test	Testing Result
CF-377-2018	2018-05-06	2018-05-09	Coarse Filter	Sta. 0+270m, El. 143.5m	Gradation	Compliant[(a)]
					Water content	2.3%
FF-383-2018	2018-05-09	2018-05-10	Fine filter	Central Dike, Sta. 0+835 m, El. 144 m.	Gradation	Compliant
					Water content	3.4%
FF-385-2018	2018-05-09	2018-05-10	Fine filter	Central Dike, Sta. 0+275 m, El. 144.5 m.	Gradation	Compliant
					Water content	2.6%
FF-386-2018	2018-05-09	2018-05-10	Fine filter	Central Dike, Sta. 0+775 m, El. 144 m.	Gradation	Compliant
					Water content	2.9%
FF-387-2018	2018-05-09	2018-05-10	Fine filter	Stockpile (SANA Crusher)	Gradation	Compliant
					Water content	3.6%
FF-388-2018	2018-05-10	2018-05-12	Fine filter	Stockpile (SANA Crusher)	Gradation	Compliant
					Water content	3.0%
FF-389-2018	2018-05-11	2018-05-12	Fine filter	Central Dike, Sta. 0+235 m, El. 145 m	Gradation	Compliant
					Water content	3.1%
FF-390-2018	2018-05-11	2018-05-12	Fine filter	Stockpile (SANA Crusher)	Gradation	Compliant
					Water content	2.9%

(a) The fine part of the curve exceeds the recommended proportions. However, the material is acceptable provided it is well graded.

Table 6: Samples Taken by the QA

Sample ID	Date Sampled	Date Tested	Fill Material Type	Location (Station/Offset Elevation)	Test	Testing Result
CF-378-2018	2018-05-06	2018-05-10	Coarse filter	Central Dike, Sta. 0+980m, El. 143.5m	Gradation	Compliant[(a)]
					Water content	4.3%
FF-384-2018	2018-05-09	2018-05-11	Coarse filter	Central Dike, Sta. 0+835 m, El. 144 m.	Gradation	Compliant
					Water content	3.3%

(a) The fine part of the curve exceeds the recommended proportions. However, the material is acceptable provided it is well graded.

7.0 PHOTOGRAPHS

Photograph CD-1830: From Sta. 0+420/-26 m, looking N. Removal of the deposition point finger materials with an excavator at Sta. 0+390 m.

Photograph CD-1831: From Sta. 40+730/-24 m, looking NE. Compaction of the first 0.5 m lift (approx.) of fine and coarse filters material at El. 143.5 m with a 10-tonne smooth-drum compactor with vibration (6 passes) from Sta. 40+730 m to 0+830 m and from Sta. 0+175 m to 0+490 m.

Photograph CD-1832: From Sta. 0+280/-25 m, looking N. Placement of a second 0.5 m thick lift of coarse filter from El. 143.5 m to 144 m with an excavator from Sta. 0+175 m to 0+280 m.

Photograph CD-1833: From Sta. 0+390/-25 m, looking S. Damaged geomembrane near a deposition finger on Central Dike at Sta. 0+390 m.

Photograph CD-1834: From Sta. 40+760/-23 m, looking NE. Placement of a first 0.5 m thick lift of coarse filter from El. 143 m to 143.5 m on length of approx. 5 m with an excavator at the location of the deposition finger at Sta. 0+520 m and 0+660 m.

Photograph CD-1835: From Sta. 0+830/-20 m, looking N. Compaction of the first 0.5 m lift (approx.) of fine and coarse filters material at El. 143.5 m with a 10-tonne smooth-drum compactor with vibration (6 passes) from Sta. 0+490 to 0+835 m.

Photograph CD-1836: From Sta. 0+830/-20 m, looking N. Placement of a first 0.5 m thick lift of fine filter from El. 143 m to 143.5 m upstream of the coarse filter with an excavator from Sta. 0+490 to 0+835 m.

Photograph CD-1837: From Sta. 0+940/-25 m, looking N. Placement of a second 0.5 m thick lift of coarse filter from El. 143.5 m to 144 m with an excavator from Sta. 0+290 to 0+500 m and from Sta. 0+835 to 0+930 m.

Photograph CD-1838: From Sta. 40+750/-31 m, looking NE. Placement of a second 0.5 m thick lift of fine filter from El. 143.5 m to 144 m upstream of the coarse filter with an excavator from Sta. 0+500 m to 0+835 m and from Sta. 0+930 to 40+730 m.

Photograph CD-1838: From Sta. 0+835/-20 m, looking N. Placement of a second 0.5 m thick lift of coarse filter from El. 143.5 m to 144 m with an excavator from Sta. 0+500 m to 0+835 m and from Sta. 0+930 to 40+730 m.

Photograph CD-1840: From Sta. 0+575/-15 m, looking NW. Compaction of the second 0.5 m lift (approx.) of fine and coarse filters material at El. 144 m with a 10-tonne smooth-drum compactor with vibration (4 passes) from Sta. 0+500 m to 40+730 m.

Photograph CD-1841: From Sta. 0+475/-14 m, looking N. Placement of a third 0.5 m thick lift of coarse filter from El. 144 m to 144.5 m with an excavator from Sta. 0+335 m to 40+730 m.

Photograph CD-1842: From Sta. 0+380/-16 m, looking S. Placement of a third 0.5 m thick lift of fine filter from El. 143.5 m to 144 m upstream of the coarse filter with an excavator from Sta. 0+335 m to 0+940 m.

Photograph CD-1843: From Sta. 0+460/-23 m, looking S. Compaction of the third 0.5 m lift (approx.) of fine and coarse filters material at El. 144.5 m with a 10-tonne smooth-drum compactor with vibration (4 passes) from Sta 0+335m to 0+900 m.

Photograph CD-1844: From Sta. 0+080/-49 m, looking SW. Placement of a fourth 0.5 m thick lift of coarse filter from El. 144.5 m to 145 m with an excavator from Sta. 0+170 m to 40+730 m.

Photograph CD-1845: From Sta. 0+660/-20 m, looking N. Profiling of the upstream slope (2H:1V) from El. 143 to 145 m with an excavator between Sta. 0+175 and 0+330 m and between Sta. 0+600 m and 0+715 m. The removed material is placed on the fourth 0.5 m thick lift of fine filter from El. 144.5 m to 145 m upstream of the coarse filter with an excavator from Sta. 0+170 m to 0+330 m and between Sta. 0+600 m and 0+715 m.

Photograph CD-1846: From Sta. 0+835/-25 m, looking N. Profiling of the upstream slope (2H:1V) from El. 143 to 145 m with an excavator between Sta. 0+330 and 0+600 m and between Sta. 0+715 m and 40+730 m. The removed material was placed with material from the fine filter stockpile on the fourth 0.5 m thick lift of fine filter from El. 144.5 m to 145 m upstream of the coarse filter with an excavator from Sta. 0+330 m to 0+600 m and between Sta. 0+715 m and 40+730 m.

Photograph CD-1847: From Sta. 0+085/-48 m, looking SE. Compaction of the fourth 0.5 m lift (approx.) of fine and coarse filters material at El. 145 m with a 10-tonne smooth-drum compactor with vibration (4 passes) from Sta. 0+170 m to 40+730 m.

Photograph CD-1848: From Sta. 40+780/-15m, looking N. Compaction of the fourth 0.5 m lift (approx.) of fine and coarse filters material at El. 145 m with a 10-tonne smooth-drum compactor with vibration (4 passes) from Sta. 0+930 m to 40+730 m.

Photograph CD-1849: From Sta. 40+750/-17 m, looking NE. Final rolling of the upstream slope in view of the LLDPE geomembrane installation from Sta. 0+170 m to 40+730 m.

Photograph CD-1850: From Sta. 0+160/+20 m, looking SW. Profiling of the downstream slope (1.5H:1V) from El. 143 to 145 m with an excavator between Sta. 0+440 m and 0+530 m and between Sta. 0+745 m and 0+835 m.

Photograph CD-1851: From Sta. 0+910/-18 m, looking S. Excavation of the LLDPE geomembrane crest anchoring trench from Sta. 40+730 m to 0+830 m.

Marion Habersetzer
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