Evolugen

Evolugen South March BESS Owner's Engineering Services
Ottawa, ON

Addendum of the Stormwater management plan

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1. Introduction

Fitzroy BESS Inc., a subsidiary of Evolugen by Brookfield Renewable (Brookfield) in partnership with the Algonquins of Pikwàkanagàn, is proposing to develop the South March Battery Energy Storage System (BESS) Project (the Project). The Project will be in the West Carleton-March Ward in the City of Ottawa, Ontario. The Project is located on two leased parcels of land at 2555 and 2625 Marchurst Road, Ottawa, Ontario, and situated south of Thomas A. Dolan Parkway, west of Marchurst Road, and north of John Aselford Drive. The Project has a Development Area of approximately 9.0 hectares on approximately 84.5 hectares of property. The leased rural lots currently include two residential buildings with an access lane, naturalized areas with woodland and wetland, as well as limited noncommercial pasture use.

The Project is a 250-megawatt (MW) energy storage facility that uses lithium ion (lithium iron phosphate) technology and is designed to store up to 1,000 megawatt hours of energy, providing four hours of continuous discharge at full capacity.

The Project will consist of 256 BESS containers at the start of commercial operations and will progressively increase to 307 BESS containers over the duration of the IESO Offtake Agreement. The additional BESS containers will be added through the augmentation process to maintain the required 250 MW capacity. This process is further detailed within the Augmentation Process Memo.

This report considers the full Augmentation Process (a total of 307 BESS containers). Its findings and conclusions are not affected by any stage of augmentation, from 256 to 307 BESS containers.

2. Objective

The objective of this addendum is to answer RVCA and city of Ottawa questions regarding the stormwater management modelling. This document needs to be read in relation to the stormwater management report (7154023-100000-41-ERA-0001_RAE).

The following figures and tables show the results in the form of a table that was extracted from the PCSWMM result included in the Stormwater management report. It is intended to facilitate the review of the result at key locations of the site. It shows result from the 100-year storm event and the two-year storm event. The two years is considered a frequent rain event.

3. Diversion watercourse and outfall surface water feature results

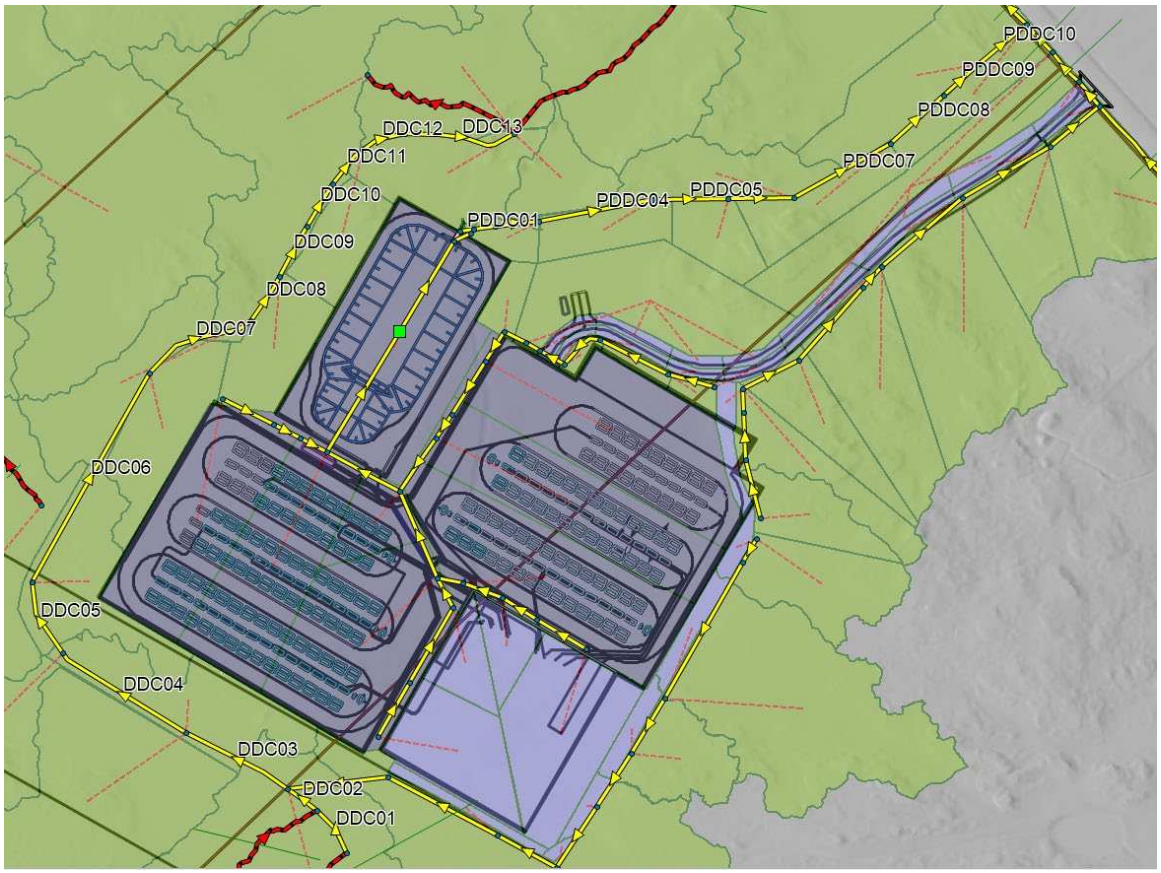

Figure 1. Layout with section ID for diversion watercourse and outfall surface water feature

4. On site ditch results

Table 1. Outfall surface water feature

Section name	Length (m)	Slope (m/m)	100-year storm		2-year storm	
			Qmax (m^3/s)	Vmax (m/s)	Qmax (m^3/s)	Vmax (m/s)
PDDC01	6.153	0.004	0.025	0.31	0.017	0.28
PDDC02	11.583	0.003	0.025	0.31	0.017	0.28

Section name	Length (m)	Slope (m/m)	100-year storm		2-year storm	
			Qmax (m^3/s)	Vmax (m/s)	Qmax (m^3/s)	Vmax (m/s)
PDDC03	23.533	0.004	0.025	0.32	0.017	0.28
PDDC04	61.212	0.004	0.033	0.31	0.017	0.27
PDDC05	40.208	0.003	0.063	0.32	0.017	0.23
PDDC06	54.345	0.002	0.090	0.41	0.019	0.28
PDDC07	38.363	0.014	0.191	0.7	0.028	0.41
PDDC08	38.184	0.006	0.240	0.63	0.038	0.36
PDDC09	25.285	0.005	0.281	0.87	0.043	0.48
PDDC10	32.861	0.026	0.317	0.94	0.046	0.56

Table 2. Diversion watercourse

Section name	Length (m)	Slope (m/m)	100-year storm		2-year storm (frequent)	
			Qmax (m^3/s)	Vmax (m/s)	Qmax (m^3/s)	Vmax (m/s)
DDC01	28.0	0.012	1.264	1.03	0.129	0.50
DDC02	19.4	0.006	1.441	0.97	0.153	0.50
DDC03	61.9	0.004	1.627	0.83	0.176	0.41
DDC04	77.9	0.004	1.682	0.85	0.182	0.40
DDC05	42.2	0.004	1.716	0.94	0.187	0.44
DDC06	127.6	0.007	1.730	1.01	0.188	0.48
DDC07	62.8	0.006	1.753	1.00	0.194	0.48
DDC08	28.0	0.006	1.753	1.00	0.193	0.47
DDC09	30.4	0.005	1.761	1.06	0.195	0.49
DDC10	26.8	0.008	1.761	1.13	0.195	0.55
DDC11	23.8	0.008	1.761	1.04	0.195	0.47
DDC12	24.8	0.010	1.767	1.28	0.197	0.68
DDC13	48.9	0.012	1.767	1.44	0.196	0.67

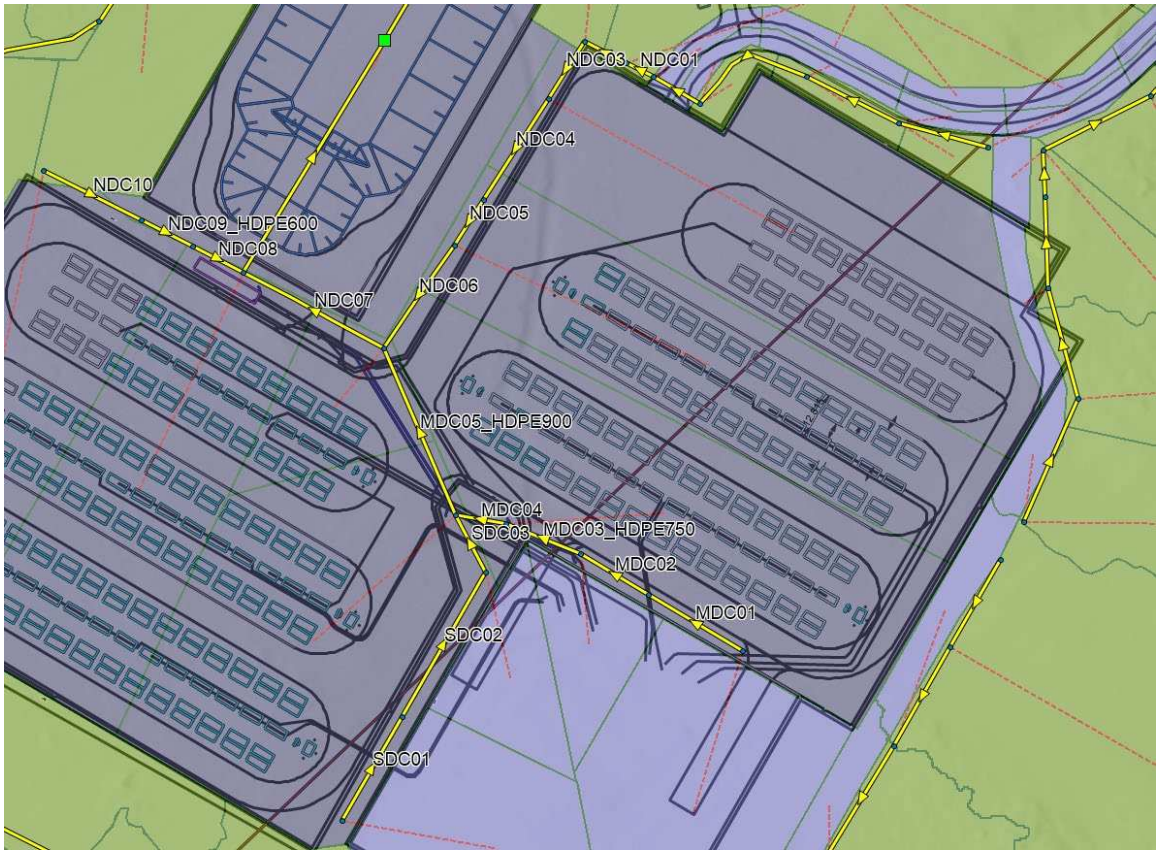

Figure 2. Layout with section ID for on-site ditches

Table 3. Main ditch

Section name	Length (m)	Slope (m/m)	100-year storm		2-year storm	
			Qmax (m^3/s)	Vmax (m/s)	Qmax (m^3/s)	Vmax (m/s)
MDC01	30.4	0.012	0.165	0.74	0.071	0.57
MDC02	21.7	0.025	0.165	0.40	0.071	0.33
MDC03_HDPE750	22.2	0.021	0.200	1.11	0.086	1.14
MDC04	14.2	0.023	0.474	0.29	0.210	0.27
MDC05_HDPE900	50.2	0.016	0.865	1.50	0.388	1.11

Table 4. Secondary ditch

Section name	Length (m)	Slope (m/m)	100-year storm		2-year storm	
			Qmax (m^3/s)	Vmax (m/s)	Qmax (m^3/s)	Vmax (m/s)
SDC01	33.08	0.02785	0.107	0.76	0.046	0.54
SDC02	46.252	0.02485	0.106	0.70	0.045	0.59
SDC03	17.949	0.02954	0.181	0.14	0.063	0.09

Table 5. North ditch

Section name	Length (m)	Slope (m/m)	100-year storm		2-year storm	
			Qmax (m^3/s)	Vmax (m/s)	Qmax (m^3/s)	Vmax (m/s)
NDC01	8.4	0.028	0.052	0.24	0.020	0.31
NDC02	13.0	0.007	0.154	0.40	0.038	0.28
NDC03	18.8	0.005	0.165	0.32	0.041	0.20
NDC04	33.2	0.005	0.431	0.42	0.164	0.37
NDC05	14.8	0.003	0.432	0.17	0.163	0.11
NDC06	34.5	0.002	0.629	0.42	0.2534	0.32
MDC07	43.9	0.007	1.540	1.06	0.661	0.84
MDC08	30.4	0.021	0.214	0.33	0.098	0.27
MDC09_HDPE600	15.8	0.004	0.213	1.39	0.098	1.24
MDC010	15.8	0.022	0.213	0.45	0.099	0.38

5. Culverts results

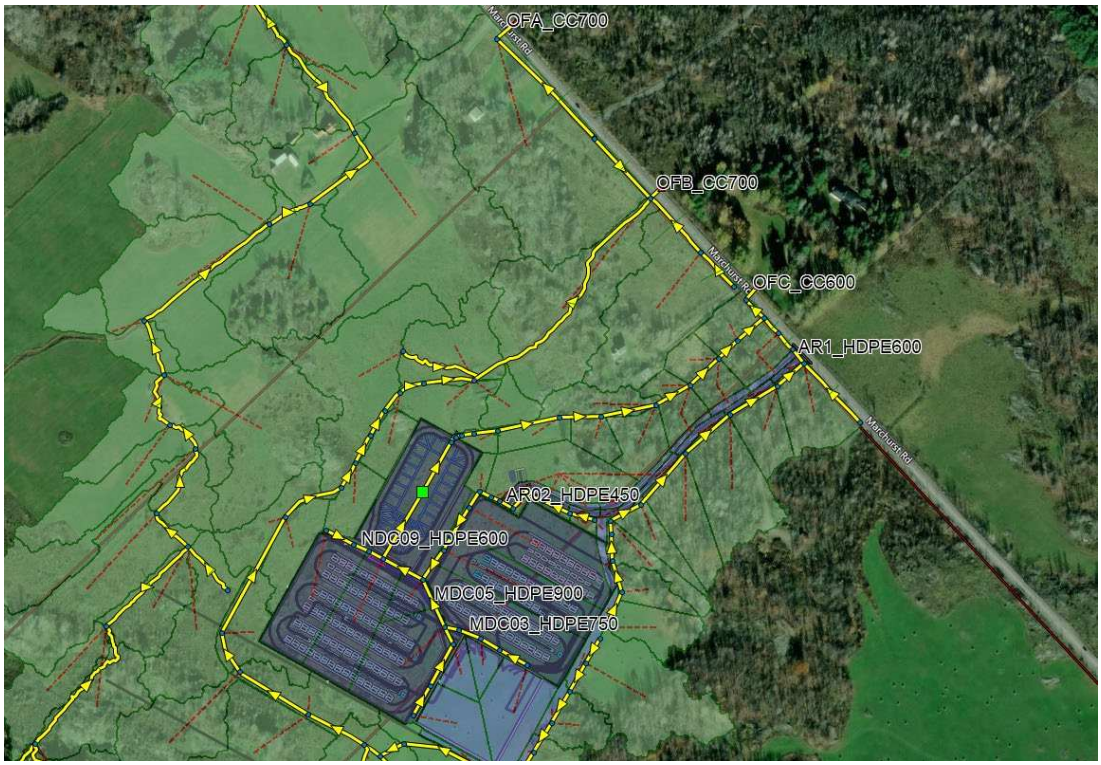

Figure 3. Layout with conduit ID of culverts (proposed and existing culverts)

Table 6. Culverts

Section name	Length (m)	Slope (m/m)	100-year storm			2-year storm		
			Qmax (m^3/s)	Vmax (m/s)	Dmax ratio	Qmax (m^3/s)	Vmax (m/s)	Dmax ratio
AR02_HDPE450	15.0	0.005	0.043	1.17	0.29	0.017	1.05	0.16
AR1_HDPE600	17.3	0.007	0.186	1.41	0.58	0.029	1.22	0.14
MDC03_HDPE750	22.2	0.021	0.200	1.11	0.6	0.086	1.13	0.27
MDC05_HDPE900	50.2	0.016	0.855	1.50	0.85*	0.38	1.11	0.54
NDC09_HDPE600	15.8	0.004	0.213	1.39	0.81*	0.098	1.24	0.32
OFA_CC700	24.5	0.012	0.229	1.34	0.46	0.017	0.54	0.14
OFB_CC700	14.1	0.009	0.815	2.23	0.90**	0.181	1.2	0.42
OFC_CC600	18.5	0.004	0.229	1.26	0.54	0.067	0.87	0.34

* MDC05_HDPE900 and NDC09_HDPE600 capacity are used during the detention time in the wet pond. Water stays within the ditch for a small period of time.

**OFB_CC700 conditions are betted by the post-development, this is due to the peak flow being decreased by the new upstream system. Pre-development Dmax ratio is 0.92.

6. Public road ditch results

Table 7. Layout with section ID public road ditch

Table 8. Public road ditch

Sections name	Length (m)	Slope (m/m)	100-year storm		2-year storm (frequent)	
			Qmax (m^3/s)	Vmax (m/s)	Qmax (m^3/s)	Vmax (m/s)
PUB_rd_DC01	78.448	0.00923	0	0	0	0
AR1_HDPE600	17.342	0.00675	0.186	1.41	0.029	1.22
PUB_rd_DC02	21.16	0.00567	0.183	0.12	0.029	0.12
PUB_rd_DC03	19.98	0.00501	0.201	0.13	0.033	0.13
PUB_rd_DC04	24.799	0.00282	0.302	0.15	0.067	0.16
PUB_rd_DC05	46.69	0.01229	0.206	0.03	0	0
PUB_rd_DC06	71.355	0.001	0.616	0.16	0.039	0.08
PUB_rd_DC07	79.344	0.001	0.316	0.07	0.027	0.03
PUB_rd_DC08	134.284	0.0028	0.057	0.06	0	0