
MEMORANDUM

DATE: April 12, 2019
TO: Rideau Valley Conservation Authority
ATTENTION: Hal Stimson, RVCA Inspector
SUBJECT: Barrhaven Conservancy
Jock River Floodplain – Cut/Fill Analysis – REVISED

This memo is prepared to summarize the proposed Jock River cut/fill analysis presented in the attached Figure 1 – Floodplain Limit Based on RVCA Jock River 1:100 Flood Risk Elevations (DSEL, April 12, 2019).

This analysis has been prepared to support development of Barrhaven Conservancy, Phase 1 and is a **proposed minor revision** to the previously approved cut/fill permit **RV5-17/18T issued September 26, 2018** (attached for ease of reference).

The attached updated figure illustrates the existing and proposed topographic conditions encountered on site as they relate to the 2005 Jock River Flood Risk Map 100-year regulatory flood elevations (cross sections 4380 + 4534 + 4803 + 5002). Existing topographic conditions are based on J.D. Barnes survey (December 22, 2017). Proposed topographic conditions are based on the Barrhaven Conservancy Phase 1 Draft Plan (dated July 27, 2018) and DSEL's proposed grading along the Regulatory Flood Limit.

Figure 1 illustrates the following:

- 1) The line of intersection of the 100-year Flood Limit Elevation and Existing Topography within the property. The line created at this intersection is considered to represent the Regulatory Flood Limit.
- 2) The proposed floodplain infill via the calculated volume between the surfaces created by i) the 100-year Regulatory Flood Limit Elevation and ii) J.D. Barnes topographic survey (December 22, 2017) within the development areas within the Regulatory Flood Limit. The 100-year water level is between 91.59 m and 91.67 m per RVCA 2005 Jock River Flood Risk Map. The total fill proposed below the 100-year water level elevation is 2,260 m³.
- 3) The proposed cut areas that were identified by comparing the surfaces created by i) the proposed draft plan (Barrhaven Conservancy Phase 1, July 27, 2018) and DSEL's proposed

grading, and ii) the 100-year Regulatory Flood Limit Elevation. The proposed plan provides areas to cut below the 100-year Regulatory Flood Limit Elevation.

The proposed cut ties into the existing topography as surveyed by J.D. Barnes, December 22, 2017, and to the proposed subdivision. The proposed depth of cut does not exceed 0.30 m below the reported 100-year Regulatory Flood Limit Elevation, in accordance with RVCA regulatory policies (Section 2.1). The 100-year water level is between 91.61 m and 91.71 m per RVCA 2005 Jock River Flood Risk Map. As demonstrated in Figure 1, the total cut proposed under the 100-year Regulatory Flood Limit Elevation is 2,290m³ (312+1,978) which is 30 m³ greater than the proposed 2,260 m³ fill within the floodplain.

Table 1 illustrates the area and volume of cut and fill with respect to the 100-year Regulatory Flood Limit Elevation:

Table 1 – Cut / Fill Relative to 100-year Flood Limit Elevation

Depth from 100-Year Regulatory Flood Limit	CUT		FILL	
	Area (m ²)	Volume (m ³)	Area (m ²)	Volume (m ³)
0 cm – 10 cm	1678	1144	4815	1210
10 cm – 20 cm	3607	927	5168	708
20 cm – 30 cm	6917	219	3272	280
30 cm – 40 cm	N/A	N/A	1150	62
40 cm – 50 cm	N/A	N/A	149	
50 cm – 60 cm	N/A	N/A	57	
TOTAL	12201	2290	14611	2260

This proposed fill is considered consistent with the intent of the RVCA policy. As demonstrated in **Table 1**, the cut volume is greater than the fill volume at every stage of the analysis, up to 0.3 m below the 100-Year Flood Limit Elevation. The total compensating cut volume exceeds the total fill volume.

David Schaeffer Engineering Ltd.

Per: Kevin L. Murphy, P.Eng

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Attach.

- Figure 1, Barrhaven Conservancy, Floodplain Limit Based on RVCA Jock River 1:100 Flood Risk Elevations
- Figure 2, Frozen Lots
- Figure 3, Cross Sections
- J.D. Barnes Draft Plan (Ref # 16-10-127-00, dated July 27, 2018)
- Prior RVCA Cut/Fill Permit (RV5-17/18T)

LEGEND

- 100-YEAR FLOOD LINE FROM INTERSECTION OF JD BARNES DEC. 22 2017 SURVEY AND FLOOD ELEVATIONS REPORTED IN RVCA 2005 JOCK RIVER FLOOD RISK MAP 2. (91.59m, 91.61m, 91.67m, 91.71m)
- SITE BOUNDARY
- 100-YEAR FLOOD ELEVATION FROM RVCA 2005 JOCK RIVER FLOOD RISK MAP 2
- PROPOSED LIMIT OF DEVELOPMENT

Elevations Table					
Number	Minimum Elevation	Maximum Elevation	Area	Color	Incr. Vol (m³)
1	0.00	-0.10	4814.85	Yellow	1210
2	-0.10	-0.20	5168.29	Orange	708
3	-0.20	-0.30	3271.69	Red	280
4	-0.30	-0.40	1150.30	Dark Red	62
5	-0.40	-0.50	148.96	Dark Red	
6	-0.50	-0.60	57.24	Dark Red	

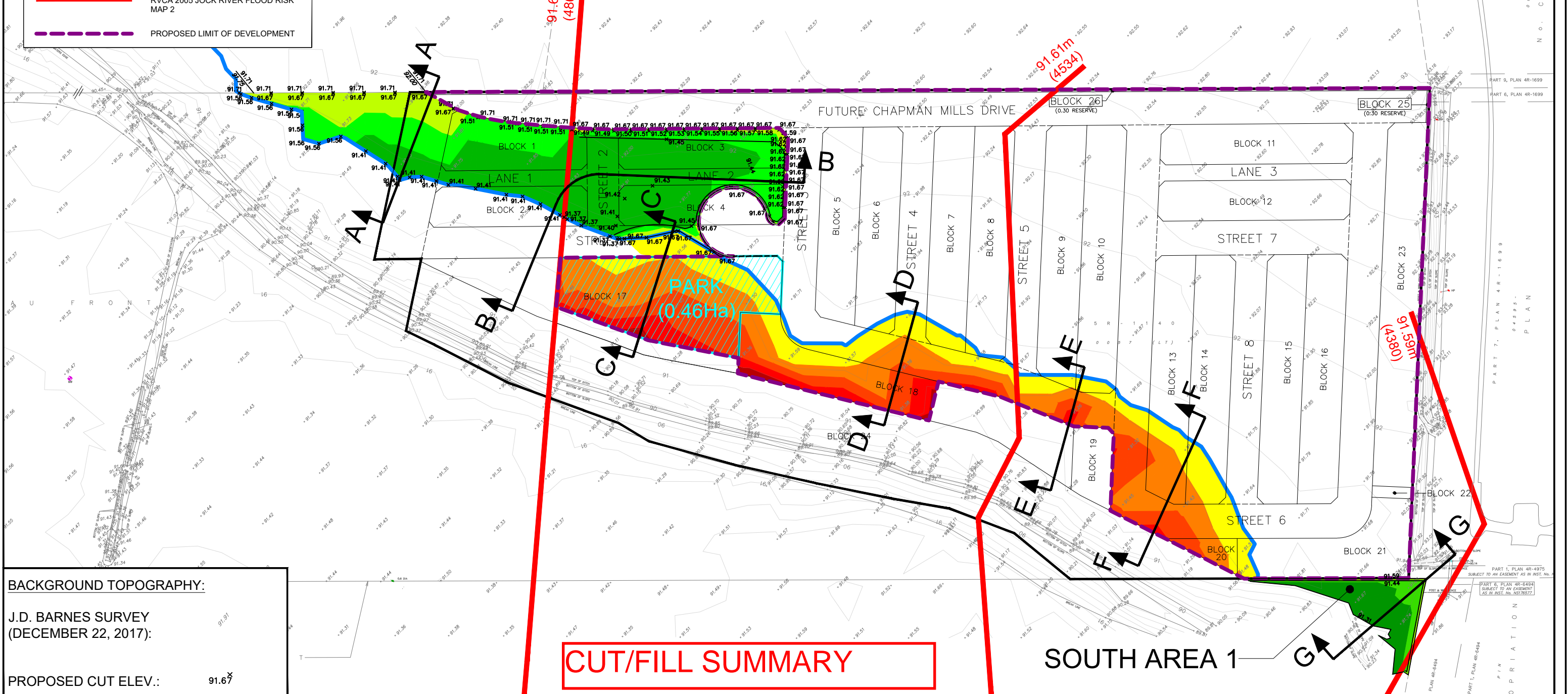
TOTAL FILL VOLUME = 2,260m³
TOTAL FILL AREA = 14,611m²

Elevations Table					
Number	Minimum Elevation	Maximum Elevation	Area	Color	Incr. Vol (m³)
1	0.00	-0.10	1582.93	Yellow	1003
2	-0.10	-0.20	3203.47	Orange	802
3	-0.20	-0.30	5954.37	Red	173

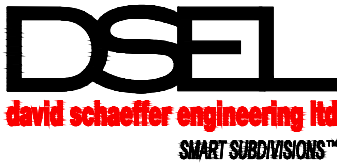
TOTAL CUT VOLUME = 1,978m³
TOTAL CUT AREA = 10,741m²

Elevations Table					
Number	Minimum Elevation	Maximum Elevation	Area	Color	Incr. Vol (m³)
1	0.00	-0.10	93.67	Yellow	141
2	-0.10	-0.20	403.03	Orange	125
3	-0.20	-0.30	962.79	Red	46

TOTAL CUT VOLUME = 312m³
TOTAL CUT AREA = 1,459m²



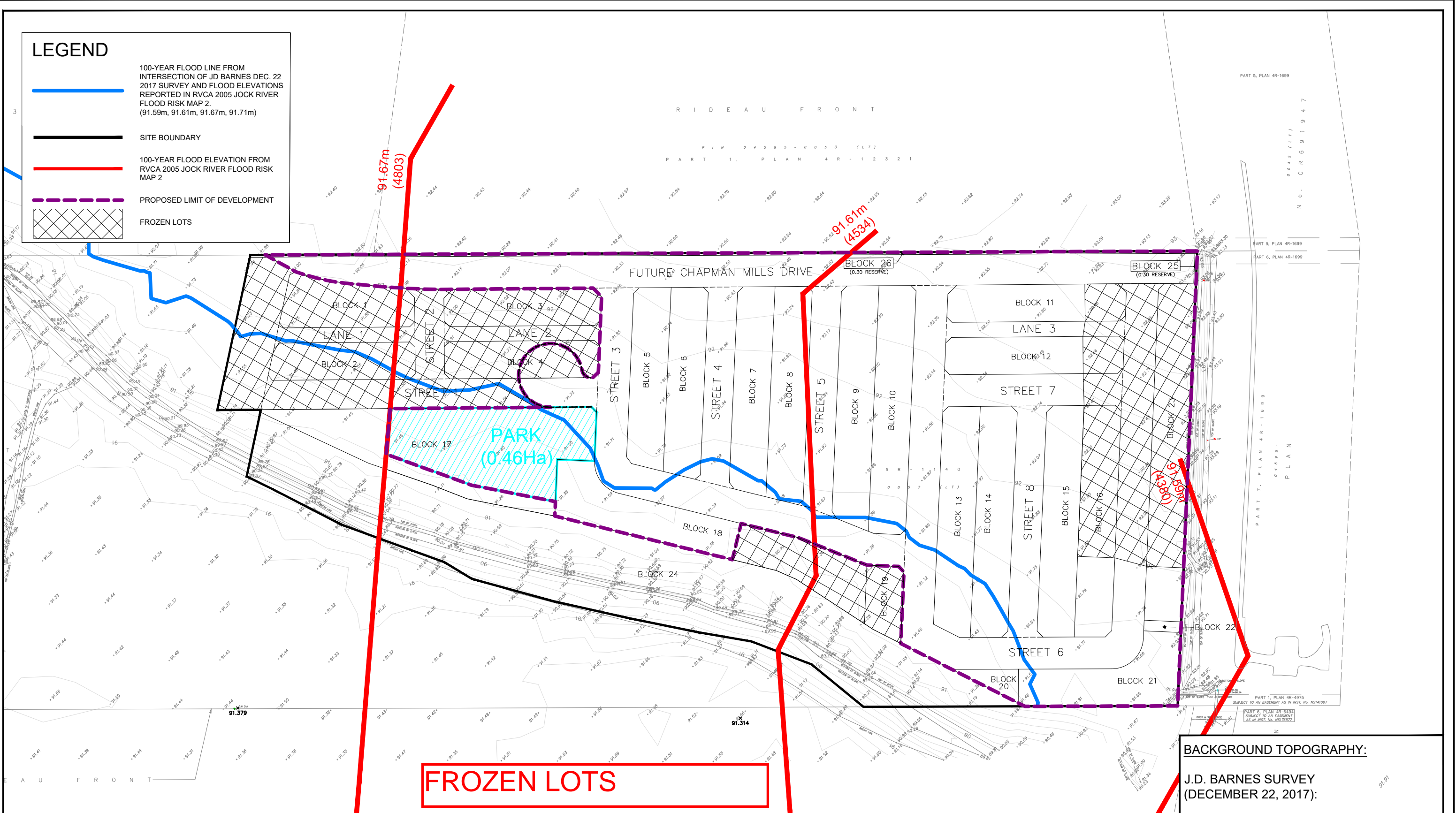
BACKGROUND TOPOGRAPHY:
J.D. BARNES SURVEY
(DECEMBER 22, 2017):
PROPOSED CUT ELEV.: 91.67



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BARRHAVEN CONSERVANCY
FLOODPLAIN LIMIT BASED ON
RVCA JOCK RIVER 1:100 FLOOD RISK ELEVATIONS

PROJECT No.:	16-891
SCALE:	1:3000
DATE:	APRIL 11, 2019
FIGURE:	1



<div><div><div>DSEL</div><div>david schaeffer engineering ltd</div><div>SMART SUBDIVISIONS™</div></div><div>120 Iber Road, Unit 103 Stittsville, ON K2S 1E9 TEL: (613) 836-0856 FAX: (613) 836-7183 www.DSEL.ca</div></div>	<div>BARRHAVEN CONSERVANCY FLOODPLAIN LIMIT BASED ON RVCA JOCK RIVER 1:100 FLOOD RISK ELEVATIONS</div>	PROJECT No.:	16-891
		SCALE:	1:2000
		DATE:	APRIL 12, 2019
		FIGURE:	2

The diagram shows a cross-section of a river channel. The vertical axis represents elevation in feet, with markings at 90, 91, and 92. The horizontal axis represents distance. A solid red line represents the 'RVCA FLOODLINE'. A dashed black line represents the 'GROUND PROFILE'. A solid black line represents the 'EX. FLOODLINE'. A vertical dashed blue line marks the 'INTERSECTION OF EX. FLOODLINE AND EX. GROUND'. A vertical dashed purple line marks the 'LIMIT OF DEVELOPMENT'. The area between the 'EX. FLOODLINE' and the 'GROUND PROFILE' is shaded green. The area between the 'RVCA FLOODLINE' and the 'EX. FLOODLINE' is shaded light green. The area between the 'GROUND PROFILE' and the 'RVCA FLOODLINE' is shaded light blue. The area to the right of the 'LIMIT OF DEVELOPMENT' is shaded light yellow.

The diagram illustrates a cross-section of a proposed development area. The vertical axis represents elevation, with markers at 90, 91, and 92. The horizontal axis represents distance. Key features include:

- RVCA FLOODLINE:** A red horizontal line at an elevation of approximately 91.7.
- INTERSECTION OF EX. FLOODLINE AND EX. GROUND:** A blue dashed vertical line at a distance of approximately 30 units from the left.
- EX. GROUND:** A dashed line representing the existing ground profile, starting at an elevation of approximately 91.0 and rising to approximately 91.8.
- GROUND PROFILE:** A solid line representing the proposed development area, starting at an elevation of approximately 91.4 and rising to approximately 91.8.
- LIMIT OF DEVELOPMENT:** A purple dashed vertical line at a distance of approximately 80 units from the left.

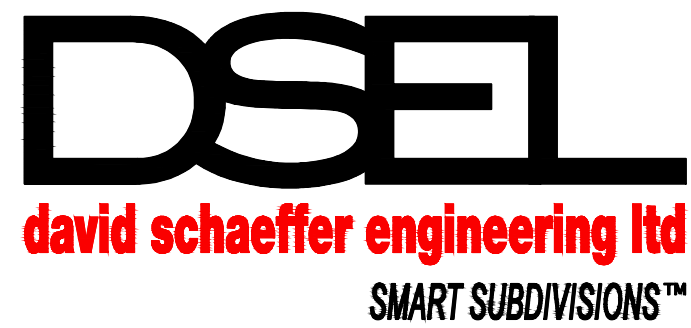
The proposed development area is shaded green/yellow, indicating the area to be developed. The area between the existing ground and the proposed development is shaded light green/yellow.

The diagram illustrates a cross-section of a levee. A horizontal red line at the top is labeled 'RVCA FLOODLINE'. A dashed black line represents the 'GROUND PROFILE'. A solid black line below the ground profile is labeled 'EX. GROUND'. A vertical purple dashed line marks the 'LIMIT OF DEVELOPMENT'. A vertical blue dashed line marks the 'INTERSECTION OF EX FLOODLINE AND EX GROUND'. The area between the ground profile and the ex. ground is shaded with a yellow-to-orange gradient.

The diagram illustrates the relationship between the RVCA Floodline, Ground Profile, and Ex. Ground. The horizontal axis represents distance, and the vertical axis represents elevation. The RVCA Floodline is shown as a horizontal red line. The Ground Profile is shown as a dashed line. The Ex. Ground is shown as a solid line. A vertical purple line marks the Limit of Development, and a vertical blue line marks the Intersection of RVCA Floodline and Ex. Ground. The area between the Floodline and the Ground Profile is shaded yellow.

The diagram illustrates the relationship between the RVCA Floodline, the existing ground (Ex. Ground), and the ground profile. The RVCA Floodline is shown as a horizontal red line. The Ex. Ground is represented by a dashed line. The Ground Profile is shown as a solid line. A vertical blue line indicates the intersection of the RVCA Floodline and the Ex. Ground. A vertical purple line marks the Limit of Development. The area between the floodline and the ground profile is shaded green and yellow.

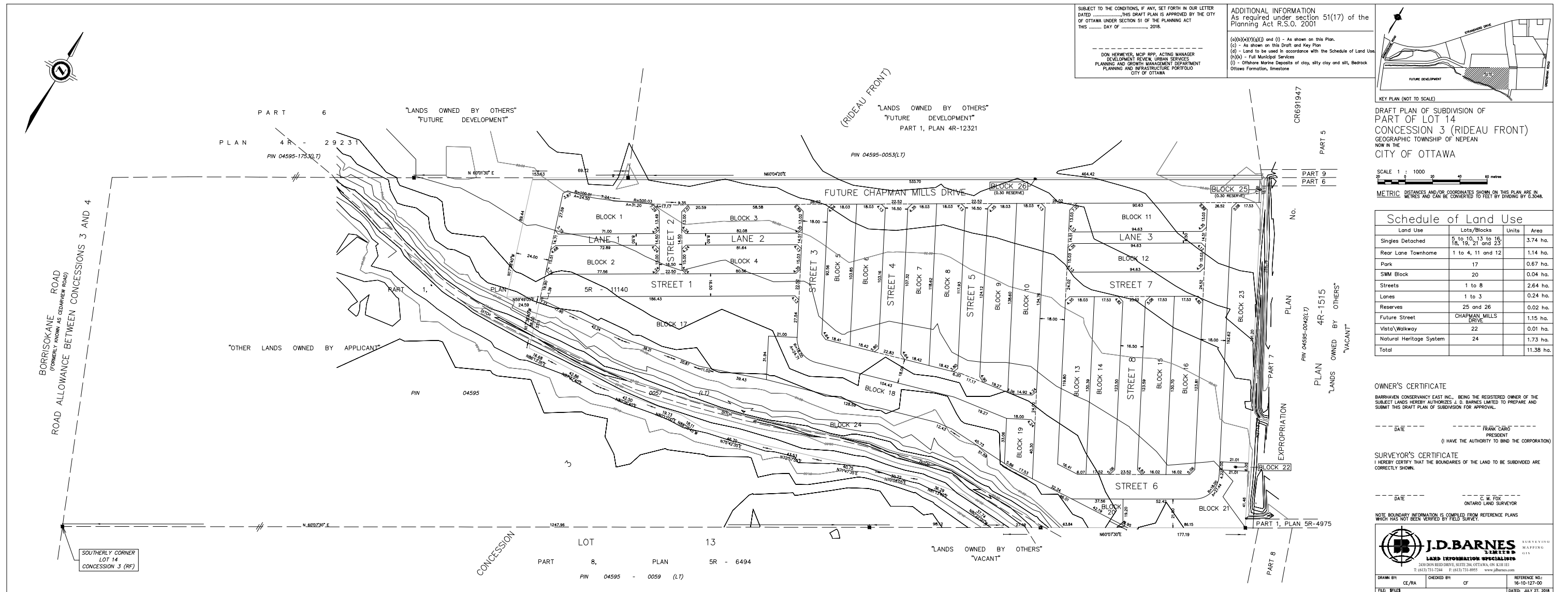
CROSS-SECTIONS



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BARRHAVEN CONSERVANCY CROSS-SECTIONS BASED ON RVCA JOCK RIVER 1:100 FLOOD RISK ELEVATIONS

PROJECT No. :	16-891
SCALE:	H:1:500 V:1:50
DATE:	APRIL 12, 2019
FIGURE No.	3



REVISED LETTER OF PERMISSION – ONTARIO REGULATION 174/06, SECTION 28 CONSERVATION AUTHORITIES ACT 1990, AS AMENDED.

Date: September 26, 2018.

File: RV5-17/18T

Contact: Hal Stimson

(613) 692-3571 Ext 1127

hal.stimson@rvca.ca

Mr. Andrew Finnson
Barrhaven Conservancy Development Corporation
c/o Caivan Communities
2934 Baseline Road
Ottawa, Ontario
K2H 1B2

Permit for Development under Section 28 of the Conservation Authorities Act for Fill placement in a regulated area at Lot 14, Concession 3 former City of Nepean now in the City of Ottawa known

Dear Mr. Finnson

The Rideau Valley Conservation Authority has reviewed your revised application and understands the proposal to be for: the placing of fill in a regulated area of the Jock River to allow Phase 1 subdivision development in accordance with the draft plan. A revised compensatory cut of 2,156 m³ over an area of 10,481m² is proposed with an offsetting corresponding fill total of 2,152 m³ over two areas totalling 11,940m² at similar elevations in compliance with RVCA fill policies.

This proposal was reviewed under Ontario Regulation 174/06, the “*Development, Interference with Wetlands and Alterations to Shorelines and Watercourses*” regulation.

PERMISSION AND CONDITIONS

By this letter the Rideau Valley Conservation Authority hereby grants you approval to undertake this project as outlined in your permit application but subject to the following conditions:

1. Approval is subject to the understanding of the project as described above and outlined in the application and submitted plans including:
 - Drawing Figure No. 1 for project 16-891 dated August 30, 2018, as prepared by DSEL.
 - Letter dated September 13, 2018 from J. Burnett, P. Eng. of JFSA to H. Stimson RVCA confirming hydraulic impacts will be negligible.
 - Letter dated August 30, 2018 from K. Murphy, P. Eng. of DSEL to H. Stimson RVCA describing the technical calculations for the project.

No conditions are subject to change/revision by the on-site contractor(s).
2. The work must ensure adequate drainage outlet for any upstream properties is maintained at all times in order to ensure no upstream flooding shall occur.
3. It is recommended that you retain the services of a professional engineer to conduct on-site inspections to ensure adequacy of the work, verify stability of the final grade and confirm all imported fill is of suitable type and has been adequately placed and compacted.
4. A final as built grading plan shall be submitted immediately upon completion of the approved works prepared by an Ontario Land Surveyor or Professional Engineer licensed to practice in Ontario indicating that grades achieved on the site conform to those indicated on the approved plan and that the proposed cut and fill volumes are achieved.
5. Only clean non-contaminated fill material will be used and all work is to occur on your property.
6. **There will be no in-water works between March 15 and July 15, of any given year to protect local aquatic species populations during their spawning and nursery time periods.**
7. No in-water work is proposed, however work in-water shall not be conducted at times when flows are elevated due to local rain events, storms or seasonal floods.
8. It is recommended that you ensure your contractor(s) are provided with a copy of this letter so as to ensure compliance with the conditions listed herein.
9. Sediment barriers should be used on site in an appropriate method according to the Ontario Provincial Standard Specifications (OPSS) for silt barriers as a minimum. Soil type, slope of land, drainage area, weather, predicted sediment load and deposition should be considered when selecting the type of sediment/erosion control.
10. Sediment and erosion control measures shall be in place before any excavation or construction works commence. All sediment/erosion control measures are to be monitored regularly by experienced personnel and maintained as necessary to ensure good working order. In the event that the erosion and sedimentation control measures are deemed not to be performing adequately, the contractor shall undertake immediate additional measures as appropriate to the situation to the satisfaction of the Conservation Authority.

11. Activities such as equipment refuelling and maintenance must be conducted away from the water to prevent entry of petroleum products, debris, or other deleterious substances into the water. Operate machinery from outside the water, or on the water in a manner that minimizes disturbance to the banks or bed of the watercourse. Equipment shall not be cleaned in the watercourse or where wash-water can enter any watercourse. Machinery is to arrive on site in a clean condition and is to be maintained free of fluid leaks
12. All disturbed soil areas must be appropriately stabilized to prevent erosion.
13. Develop a response plan that is to be implemented immediately in the event of flooding, a sediment release or spill of a deleterious substance. This plan is to include measures to: a) stop work, contain sediment-laden water and other deleterious substances and prevent their further migration into the watercourse and downstream receiving watercourses; b) notify the RVCA and all applicable authorities in the area c) promptly clean-up and appropriately dispose of the sediment-laden water and deleterious substances; and d) ensure clean-up measures are suitably applied so as not to result in further alteration of the bed and/or banks of the watercourse.
14. The owner is ultimately responsible for failure to comply with any and/or all of these conditions and must take all precautions to ensure no sediment runoff from the work site into any watercourse during and after the construction period. Failure to comply with the approval and/or conditions of this letter will result in the permit being revoked and may also result in legal action being initiated to resolve the matter to the Conservation Authority's satisfaction.
15. The applicant agrees that Authority staff may visit the subject property, before, during and after project completion, to ensure compliance with the conditions as set out in this letter of permission.
16. A new application must be submitted should any work as specified in this letter be ongoing or planned for or after September 26, 2020.
17. That the Authority be given twenty-four hours notice prior to the start of construction and within twenty-four hours of project completion.
18. All other approvals as might be required from the Municipality, and/or other Provincial or Federal Agencies must be obtained prior to initiation of work. This includes but is not limited to the Endangered Species Act., the Ontario Water Resources Act., Environmental Protection Act., Public Lands Act, the Fisheries Act and any stormwater or site plan approvals.

By this letter the Rideau Valley Conservation Authority assumes no responsibility or liability for any flood, erosion, or slope failure damage which may occur either to your property or the structures on it or if any activity undertaken by you adversely affects the property or interests of adjacent landowners. This letter does not relieve you of the necessity or responsibility for obtaining any other federal, provincial or municipal permits. This permit is not transferable to subsequent property owners.

Should you have any questions regarding this letter, please contact Hal Stimson at our Manotick office.



Terry K. Davidson P.Eng
Conservation Authority S. 28 Signing delegate
O. Reg. 174/06

Cc: J. Chandler, RPP, MCIP of J.F. Sabourin & Associates

- Pursuant to the provisions of S. 28(12) of the Conservation Authorities Act (R.S.O.1990, as amended.) any or all of the conditions set out above may be appealed to the Executive Committee of the Conservation Authority in the event that they are not satisfactory or cannot be complied with.
- Failure to comply with the conditions of approval or the scope of the project may result in the cancelling of the permission and/or initiation of legal action under S. 28(16) of the Act.
- This letter of permission does not come into full force and effect until the attached copy of this letter is returned to the Authority offices in Manotick signed and dated which return shall be taken as indicating acceptance of the conditions of the Authority's approval and acknowledgement that the details of the proposal as described in this letter are a fair and accurate representation of the proposed undertaking.

Name: _____ (print)

Signed: _____ Date: _____