

March 5, 2019

The Mayor and Council
Municipality of North Middlesex
229 Parkhill Main Street
Parkhill, ON
N0M 2K0

Gentlemen and Mesdames:

Re: Dewar-Thompson Drain

In accordance with your instructions, I have undertaken an examination of the Dewar-Thompson Drain with regards to improvements to the drainage works in the N ½ of Lots 4, 5 and 6, Concession 17 in The Municipality of North Middlesex.

Authorization under the Drainage Act

This is an Engineer's Report that has been prepared under Section 78 of the Drainage Act as per the request of an affected Landowner.

Section 78 of the Drainage Act states that, where, for the better use, maintenance or repair of any drainage works constructed under a bylaw passed under this Act, or of lands or roads, it is considered expedient to change the course of the drainage works, or to make a new outlet for the whole or any part of the drainage works, or to construct a tile drain under the bed of the whole or any part of the drainage works as ancillary thereto, or to construct, reconstruct or extend embankments, walls, dykes, dams, reservoirs, bridges, pumping stations, or other protective works as ancillary to the drainage works, or to otherwise improve, extend to an outlet or alter the drainage works or to cover the whole or any part of it, or to consolidate two or more drainage works, the Council whose duty it is to maintain and repair the drainage works or any part thereof may, without a petition required under Section 4 but on the report of an Engineer appointed by it, undertake and complete the drainage works as set forth in such report.

Existing Conditions

The existing Dewar-Thompson Drain currently outlets into an open channel in Lot 3, Concession 17. It continues generally in a southeasterly direction to the east limit of Lot 6, Concession 16. There exists a Dewar-Thompson Branch "A" which runs along Nairn

Road. Branch "A" outlets into the Dewar-Thompson Drain in Lot 19, Concession ABCR and heads east to the east limit of Lot 3, Concession 17.

The Dewar-Thompson Branch "A" was constructed under an Engineer's Report dated September 7, 2007. The Dewar-Thompson Drain was last improved under an Engineer's Report dated April 30, 1998. The open channel south of Nairn Road was improved under this report.

Drain Classification

The Dewar-Thompson Drain is currently classified as a class "F" drain upstream (south) of Nairn Road and as "Not Rated" downstream (north) of Nairn Road according to the Ontario Ministry of Agriculture, Food and Rural Affairs Mapping.

Class "F" drains are intermittent or ephemeral (dry for more than two consecutive months).

The proposed work shall be carried out during low flows in the channel. The work area is to be maintained in a dry condition during construction by the Contractor.

On Site Meeting

A Site meeting was held on April 17, 2018 at #2049 Elginfield Road.

The following is a brief summary of the April 17, 2018 meeting.

- The landowner of the N ½ of Lots 4, 5 and 6, Concession 17 requested that the Dewar-Thompson Drain be extended to a sufficient outlet. The landowner requested that the open channel be widened to provide an adequate outlet for upstream lands. The lands in the lower portion of the drain are getting flooded due to insufficient capacity in the channel. A proposed channel shall reduce erosion and flooding to minimize property damage and other negative effects on the surrounding lands.
- Dewar-Thompson Drain will get extended to the west side of Elginfield Road, unless requested for extension by downstream landowners. These landowners shall be contacted following the site meeting.

Design

The open channel has been designed to accommodate, at minimum, a design storm with a 2-year return period. This will reduce flooding and erosion, however under large storm events some flooding of surrounding lands will still occur.

It is noted that the channel shall maintain its natural meander.

Discussion

The landowners downstream of Elginfield Road were contacted and both stated that they were not interested in extending the Dewar-Thompson Drain into their properties and it was determined that this would not be required in order to provide an adequate outlet for upstream lands.

The landowner of Lot 3, Concession 17 was contacted on October 4, 2018 to determine whether they would want to include work to be undertaken on their property in this report. The current municipal drain ends approximately at their east property limit. The landowner did not have interest in undertaking any work on their property in this report. There is however, a high point in the ditch on this property. Under this report the high point shall be removed but no other will take place on this property. Therefore, the Dewar-Thompson Drain will be extended through their property, allowances paid, future specification prepared, but no immediate work, other than a high point removal, will take place in their property under this report.

The landowner of the N ½ of Lots 4, 5 and 6 requested that the lawn area, near Elginfield Road, have 3:1 side slopes on both sides of the channel in order to facilitate property maintenance.

A meeting with the ABCA was held on November 15, 2018. At this meeting contemporary design features were evaluated to alleviate concerns with the natural channel portion of the drain. A buffer strip will be incorporated as part of the drainage works for a portion of the drain. The oxbow glen to the south of the drain will be incorporated as part of the drainage works. This will serve as a secondary channel as well as a natural spawning area. Benching of the open channel was also to be analyzed. Once analyzed, it was determined that this would not be possible as the channel would need to be deepened to accommodate benching. It was not the intention under this report to deepen the channel.

Recommendations

It is therefore recommended that a new Report be prepared and the following work be carried out:

1. Extend the Dewar-Thompson Drain to the west side of Elginfield Road. This extension will include improvements to the open channel in Lots 4, 5 and 6, Concession 17 as well as incorporation of the oxbow glen.
2. Future provisions for maintenance of the open channel.

Estimate of Cost

It is recommended that the work be carried out in accordance with the accompanying Specification of Work and Profile that forms part of this Report. There has been prepared an Estimate of Cost in the amount of \$178,780.00, including engineering of the report, attending the Meeting to Consider the Report, attending the Court of Revision, tendering and an allowance for inspection. Appearances before appeal bodies have not been included in the cost estimate.

A plan has been prepared showing the location of the work and the approximate drainage area. A profile is included showing the depths and grades of the proposed work.

Assessment

As per Section 21 of the Drainage Act, the Engineer in his report shall assess for benefit and outlet for each parcel of land and road liable for assessment.

Lands, roads, buildings, utilities, or other structures that are increased in value or are more easily maintained as a result of the construction, improvement, maintenance, or repair of a drainage works may be assessed for benefit. (Section 22)

Lands and roads that use a drainage works as an outlet, or for which, when the drainage works is constructed or improved, an improved outlet is provided either directly or indirectly through the medium of any other drainage works or of a swale, ravine, creek, or watercourse may be assessed for outlet. The assessment for outlet shall be based on the volume and rate of flow of the water artificially caused to flow into the drainage works from the lands and roads liable for such assessments. (Section 23)

The Engineer may assess for special benefit any lands for which special benefits have been provided by the drainage works. (Section 24)

A Schedule of Assessment for the lands and roads affected by the work and therefore liable for the cost thereof will be prepared as per the Drainage Act. Also, assessments may be made against any public utility or road authority, as per Section 26 of the Drainage Act, for any increased cost for the removal or relocation of any of its facilities and plant that may be necessitated by the construction or maintenance of the drainage works. Items to be assessed under Section 26 shall be tendered separately with the actual cost plus a portion of the engineering (25% of the cost).

The cost of any approvals, permits or any extra work, beyond that specified in this report that is required by any utility, conservation authority, government ministry or organization (federal or provincial), or road authority shall be assessed to that organization requiring the permit, approval, or extra work.

The estimated cost of the drainage works has been assessed in the following manner:

1. The cost of reconnecting any private subsurface drainage shall be assessed to the benefitting property as a benefit assessment.
2. The remaining cost of the drainage works has been assessed with approx. 40% of the estimated cost assessed as a benefit assessment and the remainder assessed as outlet assessment to the upstream properties based on equivalent hectares.

Allowances

Under Section 29 of the Drainage Act, the Engineer in his Report shall estimate and allow in money to the Owner of any land that it is necessary to use for the construction or improvement of a drainage works or for the disposal of material removed from drainage works. This shall be considered an allowance for right-of-way.

Under Section 30 of the Drainage Act, the Engineer shall determine the amount to be paid to persons entitled thereto for damage, if any, to ornamental trees, lawns, fences, land and crops occasioned by the disposal of material removed from a drainage works. This shall be considered an allowance for damages.

Allowances have been made, where appropriate, as per Section 29 of the Drainage Act for right-of-way and as per Section 30 of the Drainage Act for damages to lands and crops. Allowances for right of way are based on a land value of \$25,000.00 per hectare. Allowances for crop loss are based on \$1,500.00 per hectare for the first year, \$750.00 for the second year (\$2,250.00 per hectare total).

Access and Working Area

Access to the work site for construction and maintenance of the Dewar-Thompson Drain shall be from Elginfield Road and along the proposed Dewar-Thompson Drain. All access to the work site shall be restricted to a width of 6 metres. The working area for construction shall be restricted to a width of 20m from the top of bank where the work is taking place and 5m from the top of bank on the opposite side. The excavation shall generally be done from the north side of the channel, however can be changed under direction of the Drainage Superintendent.

The working area at each culvert shall extend 10 metres from the bank on both sides and for 10 metres along the channel on either side of the culvert.

Access for installation of the access culverts and also for any future maintenance and repair shall be through individual properties along existing lanes along property limits, existing lanes or as provided by the Landowner.

Access for future maintenance and repair of the channel shall generally be along one side of the channel for the length of the drainage works and shall be from Elginfield Road. The side will be determined by the Drainage Superintendent at the time of maintenance. The working area shall extend from the top of the bank that the work is being carried out from for a distance of 10 metres for the length of the drainage works.

Approvals

The drain will require approval from the Ausable Bayfield Conservation Authority and the Department of Fisheries and Oceans. Construction cannot commence without necessary approvals.

Restrictions

No trees and shrubs shall be planted nor shall permanent structures be erected within 20m of either side of the proposed drain without prior written permission of Council.

Attention is also drawn to Sections 80 and 82 of the Drainage Act, which refer to the removal of obstructions in a drain and damage caused to a drain.

Agricultural Grant

If available, it is recommended that application for subsidy be made for eligible agricultural properties. Any assessments against non-agricultural properties are shown separately in the Schedule of Assessment.

Existing Private Drainage

All existing subsurface drainage encountered during the construction shall be reconnected to the open channel.

Maintenance

Upon completion of the work, the portion of the Dewar-Thompson Drain from 0+000 (west side of Elginfield Road) to 1+744 (east limit of Lot 3 , Concession 17) shall be maintained as per the applicable Schedules of Maintenance enclosed with this report unless otherwise altered under provisions of the Drainage Act or as outlined below. The remainder of the Dewar-Thompson Drain shall be repaired and maintained as per the previous reports or as outlined below.

The portion of the drain from station 1+340 to 1+744 shall only be maintained to remove obstructions. Access shall be gained perpendicular to the drain with minimal brush removed.

The oxbow glen shall be maintained and repaired with the costs assessed upstream properties based on equivalent hectares.

The access culverts along the entirety of the Dewar-Thompson Drain shall be maintained and repaired with 50% of the costs assessed to the benefitting property and the remainder assessed to upstream properties based on equivalent hectares.

If an owner requests an additional length of culvert beyond that specified in this report, the extra cost shall be borne by the landowner making the request including the future maintenance and repair. Each property is allowed one access culvert for each municipal drain with any second culvert on the property maintained and repaired 100% by the owner.

The drain shall be maintained as per the specifications and grades as shown on the Profile contained in this and previous Engineer's Reports.

Yours truly,



Josh Warner, P. Eng.
R. Dobbin Engineering Inc.



Dewar-Thompson Drain
 Municipality of North Middlesex
 March 5, 2019

ALLOWANCES

Allowances have been made as per Sections 29 & 30 of the Drainage Act for Right of Way and damages to lands and crops

Conc.	Lot or part	Roll No.	Owner	Section 29	Section 30	Total
17	Lot 3	30-096	Alsina Farms Inc c/o L. Hendrikx	6,400	450	6,850
	N 1/2 Lot 4, 5 & 6	30-093	A. Willemse	26,980	7,300	34,280
TOTAL ALLOWANCES				\$33,380	\$7,750	\$41,130

Estimate of Cost

Allowances 41,130

	<u>Quantity</u>	<u>Unit</u>	<u>Material</u>	<u>Labour</u>	
Brushing and Tree Removal (0+043 to 1+340) (Approx. 1.90 Ha)	1.0	LS	-	28,030	28,030
Excavation (0+043 to 1+340) (Approximately 7,500 cu.m)	1297	m	-	37,750	37,750
Excavation to Remove Blockages (1+340 to 1+744)	LS	1	-	1,000	1,000
Levelling of Excavated Material (Approximately 7,500 cu.m)	1297	m	-	22,650	22,650
Restoration/Seeding: Sideslopes	1	LS	3,000	480	3,480
Buffer Strip	340	sq.m	340	240	580
Reconstruct Tile Drain Outlets	4	ea	400	320	720
Silt Fence	1	LS	150	150	300
Erosion Protection	160	sq.m	9,600	2,560	<u>12,160</u>

Sub Total	\$147,800
Miscellaneous	\$5,340
Engineering	\$22,790
Inspection Allowance	\$2,400
ABCA Fee	\$450
Total Estimate	\$178,780

SCHEDULE OF ASSESSMENT (RECOMMENDED FOR COURT OF REVISION)

Conc.	Lot or Part	Affected Hectares	Roll No.	Owner	Benefit	Outlet	Total
Agricultural Land							
13	Lot 4	2.02	20-022	Bornish Facchina Inc.	-	73	73
14	Lot 3	19.43	20-029	F. Vermunt	-	704	704
	Lot 4	39.26	20-030	Centre Road Farms Inc. c/o W. Masschelein	-	1,422	1,422
	Lot 5	33.62	20-031	P. & C. Bax	-	2,277	2,277
	Lot 6	4.10	20-033	Pigs R Us c/o S. Willemse Ltd.	-	861	861
15	Lot 3	40.47	20-057	D. Hoogerbugge	-	1,466	1,466
	Lot 4	40.47	20-056	Porky Acres c/o Jack Willemse Ltd.	-	3,220	3,220
	W 1/2 Lot 5	20.23	20-055	I. & M. Schiestel	-	3,182	3,182
	E 1/2 Lot 5	20.20	20-054	I. Schiestel	-	4,241	4,241
	W 1/2 Lot 6	20.20	20-053	A. Vangameren & T. Haines	-	4,241	4,241
	E 1/2 Lot 6	10.50	20-052	D. Arcuri	-	2,204	2,204
	Lot 7	1.60	20-051	N & L McLachlan Farms Inc.	-	336	336
16	W 1/2 Lot 3	19.94	20-065	F. & M. Boere	-	3,606	3,606
	E 1/2 Lot 3	20.23	20-066	L & C Kennes & Sons Farms Ltd.	-	3,964	3,964
	W 1/2 Lot 4	20.20	20-067	L & C Kennes & Sons Farms Ltd.	-	4,241	4,241
	E 1/2 Lot 4	17.40	20-068	Joseph Masschelein Farms Ltd c/o J. Masschelein	-	3,653	3,653
	Lot 5	24.30	20-069	B. Willemse	-	5,101	5,101
	Lot 6	20.30	20-070	Kenhill Farms Ltd c/o J. Kennes	-	4,262	4,262
	Lot 7	12.20	20-071	J. & N. Kennes	-	2,561	2,561
17	W 1/2 Lot 3	8.00	20-102	S. Graham	-	1,679	1,679
	E 1/2 Lot 3	5.10	20-101	W. Mueller	-	1,071	1,071
	W 1/2 Lot 4	3.10	20-100	Kenhill Farms Ltd c/o J. Kennes	-	651	651
	E 1/2 Lot 4	1.60	20-099-01	L & C Kennes & Sons Farms Ltd.	-	336	336
ABCR	Lot 15	9.31	20-059	Vandenboggard Dairy Farms Ltd	-	337	337
(EAST)	S 1/2 Lot 16	10.12	20-060	Vandenboggard Dairy Farms Ltd	-	367	367
	N 1/2 Lot 16	14.57	20-061	Flat Acres Ltd c/o A. Kustermans	-	528	528
	S 1/2 Lot 17	15.38	20-062	Flat Acres Ltd c/o A. Kustermans	-	557	557
	Pt. N 1/2 Lot 17	11.83	20-063	W. Masschelein	-	428	428

Conc.	Lot or Part	Affected Hectares	Roll No.	Owner	Benefit	Outlet	Total
	Pt. Lot 17 & 18	13.05	20-064-01	M. Masschelein	-	1,680	1,680
	Pt. Lot 18	34.64	20-064	W. Masschelein	-	6,220	6,220
	Lot 19	39.27	20-103	H & E Kennes Farms Inc c/o D. Kennes	-	8,244	8,244
	Lot 20	6.07	20-104	N. & L. Eagleson	-	1,274	1,274
ABCR	Lot 16	14.16	30-066	Kenvalley Farms Ltd c/o A. Kennes	-	513	513
(WEST)	Lot 17	34.40	30-067	Kenvalley Farms Ltd c/o A. Kennes	-	1,246	1,246
	Lot 18	37.23	30-068	Centre Road Farms Inc. c/o W. Masschelein	-	1,348	1,348
	S 1/2 Lot 19	20.03	30-097	Lymarikx Farms Limited	-	1,429	1,429
	N 1/2 Lot 19	19.86	30-098	Joseph Masschelein Farms Ltd c/o J. Masschelein	-	3,320	3,320
	Lot 20	34.40	30-099	Joseph Masschelein Farms Ltd c/o J. Masschelein	-	7,222	7,222
17	Lot 3	40.27	30-096	Alsina Farms Inc c/o L. Hendrikx	5,624	4,561	10,185
	S 1/2 Lot 4 & 5	30.76	30-095-01	Centre Road Farms Inc. c/o W. Masschelein	-	1,114	1,114
	S 1/2 Lot 6	4.66	30-095	Brisher Farms Ltd. c/o B. Masschelein	-	169	169
	N 1/2 Lot 4, 5 & 6	52.57	30-093	A. Willemse	66,094	46	66,140
					71,718	95,955	167,673
				Total Benefit	71,718		
				Total Outlet	95,955		
				Total Agricultural Lands	167,673		

Conc.	Lot or Part	Affected Hectares	Roll No.	Owner	Benefit	Outlet	Total
Non-Agricultural Lands							
16	Pt. W 1/2 Lot 3	0.40	20-065-10	L & C Kennes & Sons Farms Ltd.	-	168	168
17	Pt. E 1/2 Lot 4	0.76	20-099	D. & A. Winter	-	319	319
ABCR (W)	Pt. N 1/2 Lot 19	0.37	30-098-01	Hydro One Networks Inc.	-	155	155
17	Pt. N 1/2 Lot 6	0.42	30-094	C. & B. Moir	-	30	30
					-	672	672
				Total Benefit	-		
				Total Outlet	672		
				Total Non-Agricultural Lands	672		
Public Lands: Roads							
	Springbank Road	4.20		Municipality of North Middlesex	-	1,447	1,447
	Centre Road	6.53		County of Middlesex	-	2,913	2,913
	Unopened Road Allowance (Lot 5/6)	1.57		Municipality of North Middlesex	-	165	165
	Elginfield Road	0.40		County of Middlesex	-	8	8
	Coldstream Road	3.85		Municipality of North Middlesex	-	1,044	1,044
	Nairn Road	8.30		County of Middlesex	-	4,858	4,858
					-	10,435	10,435
				Total Benefit	-		
				Total Outlet	10,435		
				Total - Public Lands: Roads	10,435		
				Total Agricultural Lands	167,673		
				Total Non-Agricultural Lands	672		
				Total Assessment	\$178,780		

SCHEDULE OF MAINTENANCE (RECOMMENDED FOR COURT OF REVISION)

To maintain the Dewar-Thompson Drain from Station 0+000 to 1+744.

Conc.	Lot or Part	Affected Hectares	Roll No.	Owner	Benefit	Outlet	Total	Equivalent Ha
Agricultural Land								
13	Lot 4	2.02	20-022	Bornish Facchina Inc.	-	3	3	2.02
14	Lot 3	19.43	20-029	F. Vermunt	-	28	28	19.43
	Lot 4	39.26	20-030	Centre Road Farms Inc. c/o W. Masschelein	-	56	56	39.26
	Lot 5	33.62	20-031	P. & C. Bax	-	105	105	33.62
	Lot 6	4.10	20-033	Pigs R Us c/o S. Willemse Ltd.	-	44	44	4.10
15	Lot 3	40.47	20-057	D. Hoogerbugge	-	58	58	40.47
	Lot 4	40.47	20-056	Porky Acres c/o Jack Willemse Ltd.	-	151	151	40.47
	W 1/2 Lot 5	20.23	20-055	I. & M. Schiestel	-	160	160	20.23
	E 1/2 Lot 5	20.20	20-054	I. Schiestel	-	216	216	20.20
	W 1/2 Lot 6	20.20	20-053	A. Vangameren & T. Haines	-	216	216	20.20
	E 1/2 Lot 6	10.50	20-052	D. Arcuri	-	113	113	10.50
	Lot 7	1.60	20-051	N & L McLachlan Farms Inc.	-	17	17	1.60
16	W 1/2 Lot 3	19.94	20-065	F. & M. Boere	-	183	183	19.94
	E 1/2 Lot 3	20.23	20-066	L & C Kennes & Sons Farms Ltd.	-	202	202	20.23
	W 1/2 Lot 4	20.20	20-067	L & C Kennes & Sons Farms Ltd.	-	216	216	20.20
	E 1/2 Lot 4	17.40	20-068	Joseph Masschelein Farms Ltd c/o J. Masschelein	-	186	186	17.40
	Lot 5	24.30	20-069	B. Willemse	-	260	260	24.30
	Lot 6	20.30	20-070	Kenhill Farms Ltd c/o J. Kennes	-	218	218	20.30
	Lot 7	12.20	20-071	J. & N. Kennes	-	131	131	12.20
17	W 1/2 Lot 3	8.00	20-102	S. Graham	-	86	86	8.00
	E 1/2 Lot 3	5.10	20-101	W. Mueller	-	55	55	5.10
	W 1/2 Lot 4	3.10	20-100	Kenhill Farms Ltd c/o J. Kennes	-	33	33	3.10
	E 1/2 Lot 4	1.60	20-099-01	L & C Kennes & Sons Farms Ltd.	-	17	17	1.60
ABCR	Lot 15	9.31	20-059	Vandenboggard Dairy Farms Ltd	-	13	13	9.31
(EAST)	S 1/2 Lot 16	10.12	20-060	Vandenboggard Dairy Farms Ltd	-	14	14	10.12

Conc.	Lot or Part	Affected Hectares	Roll No.	Owner	Benefit	Outlet	Total	Equivalent Ha
	N 1/2 Lot 16	14.57	20-061	Flat Acres Ltd c/o A. Kustermans	-	21	21	14.57
	S 1/2 Lot 17	15.38	20-062	Flat Acres Ltd c/o A. Kustermans	-	22	22	15.38
	Pt. N 1/2 Lot 17	11.83	20-063	W. Masschelein	-	17	17	11.83
	Pt. Lot 17 & 18	13.05	20-064-01	M. Masschelein	-	83	83	13.05
	Pt. Lot 18	34.64	20-064	W. Masschelein	-	315	315	34.64
	Lot 19	39.27	20-103	H & E Kennes Farms Inc c/o D. Kennes	-	421	421	39.27
	Lot 20	6.07	20-104	N. & L. Eagleson	-	65	65	6.07
ABCR	Lot 16	14.16	30-066	Kenvalley Farms Ltd c/o A. Kennes	-	20	20	14.16
(WEST)	Lot 17	34.40	30-067	Kenvalley Farms Ltd c/o A. Kennes	-	49	49	34.40
	Lot 18	37.23	30-068	Centre Road Farms Inc. c/o W. Masschelein	-	53	53	37.23
	S 1/2 Lot 19	20.03	30-097	Lymarikx Farms Limited	-	66	66	20.03
	N 1/2 Lot 19	19.86	30-098	Joseph Masschelein Farms Ltd c/o J. Masschelein	-	167	167	19.86
	Lot 20	34.40	30-099	Joseph Masschelein Farms Ltd c/o J. Masschelein	-	369	369	34.40
17	Lot 3	40.27	30-096	Alsina Farms Inc c/o L. Hendrikx	808	186	994	40.27
	S 1/2 Lot 4 & 5	30.76	30-095-01	Centre Road Farms Inc. c/o W. Masschelein	-	44	44	30.76
	S 1/2 Lot 6	4.66	30-095	Brisher Farms Ltd. c/o B. Masschelein	-	7	7	4.66
	N 1/2 Lot 4, 5 & 6	52.57	30-093	A. Willemse	2,680	-	2,680	52.57
					3,488	4,686	8,174	
				Total Benefit	3,488			
				Total Outlet		4,686		
				Total Agricultural Lands			8,174	

Conc.	Lot or Part	Affected Hecatares	Roll No.	Owner	Benefit	Outlet	Total	Equivalent Ha
Non-Agricultural Lands								
16	Pt. W 1/2 Lot 3	0.40	20-065-10	L & C Kennes & Sons Farms Ltd.	-	9	9	0.80
17	Pt. E 1/2 Lot 4	0.76	20-099	D. & A. Winter	-	16	16	1.52
ABCR (W)	Pt. N 1/2 Lot 19	0.37	30-098-01	Hydro One Networks Inc.	-	8	8	0.74
17	Pt. N 1/2 Lot 6	0.42	30-094	C. & B. Moir	-	1	1	0.84
					-	34	34	
				Total Benefit	-			
				Total Outlet	34			
				Total Non-Agricultural Lands	34			
Public Lands: Roads								
	Springbank Road	4.2		Municipality of North Middlesex	-	71	71	12.60
	Centre Road	6.53		County of Middlesex	-	142	142	26.12
	Unopened Road Allowance (Lot 5/6)	1.57		Municipality of North Middlesex	-	8	8	1.57
	Elginfield Road	0.4		County of Middlesex	-	-	-	1.60
	Coldstream Road	3.85		Municipality of North Middlesex	-	50	50	11.55
	Nairn Road	8.3		County of Middlesex	-	243	243	33.20
					-	514	514	
				Total Benefit	-			
				Total Outlet	514			
				Total - Public Lands: Roads	514			
				Total Agricultural Lands	8,174			
				Total Non-Agricultural Lands	34			
				Total Assessment	\$8,722			

Dewar-Thompson Drain
Municipality of North-Middlesex
March 5, 2019

SPECIFICATION OF WORK

1. Location

The Dewar-Thompson Drain outlets into an open channel near the east limit of Lot 3, Concession 17. The Dewar-Thompson Drain will, under this report, be extended downstream to a sufficient outlet on the west side of Elginfield Road.

2. Scope of Work

The work shall be completed in the N ½ of Lots 4, 5 and 6, Concession 17.

- Brushing and tree removal
- Excavation of an open channel
- Levelling of excavated material
- Supply and install of erosion protection

3. General

Each tenderer must inspect the site prior to submitting their tender and satisfy themselves by personal examination as to the local conditions that may be encountered during this project. The Contractor shall make allowance in their tender for any difficulties which they may encounter. Quantities or any information supplied by the Engineer is not guaranteed and is for reference only.

All work and materials shall be to the satisfaction of the Drainage Superintendent who may vary these specifications as to minor details but in no way decrease the proposed capacity of the drain.

The Contractor shall be responsible for the notification of all utilities prior to the start of construction.

Measurement for Payment Clauses have not been included in these specifications and will be part of the Construction document. If the Construction document has not identified Measurement for Payment Clauses, the Contractor must notify the Municipality of North Middlesex and request clarification 2 days prior to pricing the project.

4. Plans and Specifications

These specifications shall apply and be part of the Contract along with the General Specifications for Closed Drains and the General Specifications for Open Drains. This Specification of Work shall take precedence over all plans and general conditions pertaining to the Contract. The Contractor shall provide all labour, equipment, and supervision necessary to complete the work as shown in the Plans and described in these specifications. Any work not described in these specifications shall be completed according to the Ontario Provincial Standard Specifications and Standard Drawings.

Any reference to the Owner contained in these Contract Documents shall refer to The Municipality of North Middlesex or the Engineer authorized by The Municipality of North Middlesex to act on its behalf.

5. Health and Safety

The Contractor at all times shall be responsible for health and safety on the worksite including ensuring that all employees wear suitable personal protective equipment including safety boots and hard hats.

When applicable the Contractor shall be responsible for traffic control as per the Ontario Traffic Manual Book 7 – Temporary Conditions (latest revision).

The Contractor shall be responsible to ensure that all procedures are followed under the Occupational Health and Safety Act to ensure that work sites are safe and that accidents are prevented. In the event of a serious or recurring problem, a notice of non-compliance will be issued. The Contractor will be responsible for reacting immediately to any deficiency and correcting any potential health and safety risk. Continuous disregard for any requirement of the Occupational Health and Safety Act could be cause for the issuance of a stop work order or even termination of the Contract.

The Contractor shall also ensure that only competent workers are employed onsite and that appropriate training and certification is supplied to all employees.

6. Workplace Safety and Insurance Board

The Contractor hereby certifies that all employees and officers working on the project are covered by benefits provided by the Contractor. The WSIB Clearance Certificate must be furnished prior to the execution of the Contract and updated every 90 days.

7. Benchmarks

The benchmarks are based on geodetic elevations. Elevations are available at the locations shown on the Plan and Profile drawings. Where these elevations are on existing structures to be replaced, they shall be transferred by the Contractor prior to the removal of the culvert.

The Contractor is required to complete a benchmark loop prior to construction to verify the benchmarks. If discrepancies exist the Contractor must notify the Drainage Superintendent and Engineer prior to completing any work.

8. Access and Working Area

Access to the work site for construction and maintenance of the Dewar-Thompson Drain shall be from Elginfield Road and along the proposed Dewar-Thompson Drain. All access to the work site shall be restricted to a width of 6 metres. The working area for construction shall be restricted to a width of 20m from the top of bank where the work is taking place and 5m from the top of bank on the opposite side. The excavation shall generally be done from the north side of the channel, however can be changed under direction of the Drainage Superintendent.

The working area at each culvert shall extend 10 metres from the bank on both sides and for 10 metres along the channel on either side of the culvert.

Access for installation of the access culverts and also for any future maintenance and repair shall be through individual properties along existing lanes along property limits, existing lanes or as provided by the Landowner.

Access for future maintenance and repair of the channel shall generally be along one side of the channel for the length of the drainage works and shall be from Elginfield Road. The side will be determined by the Drainage Superintendent at the time of maintenance. The working area shall extend from the top of the bank that the work is being carried out from for a distance of 10 metres for the length of the drainage works.

9. Brushing and Tree Removal

All brush, trees, woody vegetation, etc. shall be removed from the working area. They shall be removed in their entirety including stumps.

It is recommended that a mechanical grinder attached to an excavator be used for the removal of brush and trees. Any brush and trees too large to grind shall be close cut. The

Contractor shall be responsible for disposal of the trees and brush. The Contractor is responsible for obtaining all necessary permits for any disposal sites. Burning of the trees and brush is subject to local bylaws and guidelines of the Ministry of the Environment.

Certain trees may be left in place at the direction of the Drainage Superintendent. Any trees to be salvaged by individual Landowners shall be marked by the landowner prior to construction. These trees shall be close cut and piled in one pile for each landowner. The disposal of these trees is the responsibility of the landowner.

For future maintenance it is recommended that, if necessary, appropriate spray be applied to the stumps, brush, and after-growth for two years following construction to maintain brush control.

10. Excavation of Open Channel

The open channel shall be excavated and maintained to the depths and grades as per the profile and drawings as contained in this Engineers Report. The channel shall be excavated to the proper depth using a laser or similar approved device with a labourer onsite to ensure correctness of grade and to confirm location of tile ends.

The excavated material shall be cast on the north side of the channel at least 1.5 metres clear of the bank. Excavated material shall not be placed in low runs or swales out letting surface water to the channel. The excavated material shall be levelled to a maximum depth of 150mm and left in a condition suitable for cultivation. All high spots above grade shall be removed. The sediment shall be removed leaving a rounded bottom with the intent not to undercut the existing side slopes.

11. Erosion Protection in New Channel

Erosion protection shall be placed at locations where the channel bends, and erosion occurs. The exact locations shall be determined by the Drainage Superintendent at the time of construction.

Severe bends are noted at Stations 0+123, 0+176, 0+264 and 0+578. Possible erosion would occur at the entrance of the 16th Concession Drain into the Dewar-Thompson Drain (Station 0+417). This area shall receive rip rap.

The areas to receive the rip rap shall first be graded to allow the placement of the rip rap to a depth of 300 mm below finished grade. After grading, filter cloth (Terrafix 270R or approved equal) is to be placed with any joints overlapped a minimum of 600 mm. Rip

rap shall then be placed with the smaller pieces placed in the gaps and voids to give it a uniform appearance.

Erosion protection consisting of rip rap (100mm x 250mm quarry stone) shall be placed as per the paragraph above. It shall extend from the outside top of bank to the inside toe of the channel for the entirety of the bend plus 5 metres upstream and downstream.

12. Removals (Future)

The existing access culverts shall be removed in its entirety from the open channel. The culvert and the concrete rubble shall be disposed offsite at the expense of the Contractor. Suitable backfill shall be stockpiled adjacent to the site for reuse during installation of the proposed culvert. Any broken concrete or rip rap (concrete bags) from the existing structures may be reused as erosion protection in the immediate vicinity (within 1 metre) of the proposed culvert replacement. The broken concrete or rip rap must be placed over filter fabric flush with the existing channel side slope. Large pieces of concrete, excavated material from the side slope to accommodate erosion protection and any material not suitable for use shall be disposed offsite by the Contractor.

13. Installation of Access Culvert (Future)

The Contractor shall supply, install, and backfill aluminized corrugated steel pipe with a minimum wall thickness of 2.8mm in all cases. All corrugation profiles shall be of helical lockseam manufacture using 68 x 13mm corrugations for 1600mm dia. pipe and smaller and 125 x 25mm corrugations for 1800mm dia. pipe and larger. Pipe with 125 x 25mm corrugations shall be used if 68 x 13mm corrugations are not available. Future culvert replacements shall be to the same specifications.

The culvert designated to be replaced in the future under this report shall be examined after any cleanout of the open channel as to its condition. If it is found to be in disrepair (i.e. there are holes corroded in the bottom or sides) it shall be replaced as per these specifications.

The access culverts shall be installed in the same general location as the existing access culvert. The culvert shall be installed with the invert 10% (minimum 150mm) below the proposed channel bottom elevation. The location of the culvert may be moved a short distance upstream or downstream if approved by the engineer.

If an owner requests a longer culvert than that specified above, please refer to the report. The culvert lengths are based on using concrete block walls. If rip rap ends are to be utilized in the future, the culverts may be lengthened to accommodate the sloped ends

(1.5:1.0). The proposed access culvert shall be installed in the same general location as the existing access culvert. The culvert may be moved upstream or downstream as necessary to avoid existing tile outlets. The pipes that shall be extended upstream or downstream of the proposed culvert shall be done with non-perforated HDPE agricultural tubing with a manufactured coupling, elbow and rodent grate. Any tile outlets extended as a result of extra length requested by an owner shall be extended at the owner's expense. The culvert shall be installed with the invert set 10% below the design channel bottom (minimum 150mm) and to grade shown on the Profile.

The bottom of the excavation shall be excavated to the required depth with any over excavation backfilled with granular material or drainage stone. When the pipe has been installed to the proper grade and depth, the excavation shall be backfilled with granular or drainage stone from the bottom of the excavation to the springline of the pipe. Care shall be taken to ensure that the backfill on either side of the culvert does not differ by more than 300mm so that the pipe is not displaced. The access culverts shall be backfilled from the springline to finished grade with excavated material to within 150mm of finished grade. If extra backfill material is required, it shall be supplied by the Contractor at the expense of the drainage works. The top 150mm shall be backfilled with compacted granular "A" material to finished grade.

All backfill shall be free from deleterious material. Any excess granular material shall be placed at the surface on the travel portion of the access culvert. All granular bedding material shall be mechanically compacted to 95% modified standard proctor density. All backfill material above the springline shall be mechanically compacted using appropriate compaction equipment. The Contractor shall supply any extra backfill material required above the springline.

End protection shall consist of concrete blocks with dimensions of approx. 600mm x 600mm x 1200mm, 600mm x 600mm x 2400mm or 300mm x 600mm x 1200mm as required. The top of the culvert shall govern block elevation. The correct block shall be set with the top of the block equal to the top of the culvert. The blocks shall be set at each end of the culvert so that each row of blocks will be offset approx. 100mm from the row below. The bottom row shall consist of one block placed parallel to the culvert. The blocks shall be imbedded a minimum of 300mm into each bank and shall extend into the drain bottom to match the pipe invert or below.

The blocks shall be placed over a layer of filter fabric (Terrafix 270R or approved equal). The culvert shall be backfilled in conjunction with the placement of the blocks. The gaps between the culvert and the blocks shall be filled with concrete cinder blocks/bricks and mortar to give the endwall a finished appearance.

If rip rap ends are to be used, the pipes shall be lengthened to accommodate the travel width plus minimum 1.5:1 sideslopes. The rip rap shall consist of 100mm x 250mm quarry stone or approved equal. The area to receive the rip rap shall be graded to a depth of 400mm below finished grade. Filter fabric (Terrafix 250R or approved equal) shall then be placed with any joints overlapped a minimum 600mm. The quarry stone shall then be placed with the smaller pieces placed in the gaps and voids to give it a uniform appearance.

The Contractor shall maintain a dry working area during construction. The Contractor shall install a silt fence downstream of the work area (at bottom end of channel improvement if all work is completed at the same time). The silt fence shall consist of filter fabric or manufactured silt fence supported with posts (OPSD 219.190).

After completion of the construction, the silt fence and any collected sediment shall be removed.

14. Subsurface Drainage

Landowners are required to mark field tile prior to construction.

All existing subsurface drains encountered during construction of the open channel shall be reconnected to the open channel unless otherwise noted on the drawings or as directed by the Drainage Superintendent.

A suitable length of equivalent sized PE agricultural tubing shall be used to connect the drain to the open channel. Manufactured fittings shall connect the PE tile to the existing drain and to the concrete tile. The connections shall be carefully backfilled to ensure there is adequate support under the pipe and large clumps of clay do not displace the tile.

15. Oxbow (FUTURE)

The existing oxbow south of the Dewar-Thompson Drain (as shown on the detailed plan) shall be incorporated as part of the drainage works. The oxbow has maintained channel characteristics and does not require improvement under this report. It shall be maintained with the removal of any sediment and brush as needed. Rip rap may be placed at the outlet or inlet of the oxbow as required.

16. Seeding/Restoration and Buffer Strip

The side slopes of the channel, where disturbed by construction, shall be hand seeded on a daily basis with the seed mixture, fertilizer and application rate as shown below. Spreading of the seed shall be by use of a mechanical spreader.

Upon completion of excavation, the disturbed side slopes of the channel plus a buffer strip extending 1.0 metre from the north top of bank from station 0+043 to 0+419 shall be restored with hydraulic seed and mulch in accordance with OPSS 572. Seed mixture, fertilizer and application rates are as follows:

- Primary seed (85 kg/ha.) consisting of 50% red fescue, 40% perennial rye-grass and 5% white clover.
- Nurse crop consisting of Italian (annual) rye-grass at 25% of total weight.
- Fertilizer (300 kg/ha.) consisting of 8-32-16.
- Hydraulic mulch (2,999 kg/ha.) type “B” and water (52,700 litres/ha.).

The above seed mixture shall apply unless otherwise approved by the Drainage Superintendent or Engineer.

17. Environmental Considerations

The Contractor shall take care to adhere to the following considerations.

- Operate machinery in a manner that minimizes disturbance to the banks of the watercourse.
- Erosion and sediment control measures must be installed prior to construction to prevent sediment from entering the water body.
- Material shall not be placed in areas regulated by the Conservation Authority or Ministry of Natural Resources.
- All granular and erosion control materials shall be stockpiled a minimum of 3.0m from the top of the bank or excavation. Material shall not be placed in surface water runs or open inlets that enter the channel.
- All activities, including maintenance procedures, shall be controlled to prevent the entry of petroleum products, debris, rubble, concrete, or other deleterious substances into the water. Vehicle and equipment refuelling and maintenance shall be conducted away from the channel, any surface water runs, or open inlets. All waste materials shall be stockpiled well back from the top of the bank and all surface water runs and open inlets that enter the drain.
- When possible, all construction within the open channel shall be carried out during periods of low flow or in dry conditions.

- The Contractor shall conduct regular inspections and maintain erosion and sediment control measures and structures during the course of construction.
- The Contractor shall repair erosion and sediment control measures and structures if damage occurs.
- The Contractor shall remove non-biodegradable erosion and sediment control materials once site is stabilized.
- **The channel is to maintain its natural meander.**
- Remove all construction materials from site upon project completion.

18. Silt Fence

Light duty silt fencing shall be installed down-gradient of the work for the duration of construction.

The light duty silt fencing shall be supplied and installed in accordance with OPSS 577 and OPSD 219.110. The light duty silt fencing shall be removed once the disturbed area has been re-vegetated.

19. Miscellaneous

When crossing utilities the Contractor is responsible to co-ordinate construction with the affected companies and complete construction in accordance with the affected company requirements.

December 11, 2018

File: L.2.11.

Municipality of North Middlesex
Attn: Glen Bullock Drainage Superintendent
34665 Creamery Rd
RR#3
Ailsa Craig, ON
N0M 1A0

Dear Mr. Bullock:

**Re: Final Report for the Dewar-Thompson Drain
Lots 4-6, Concession 17
Municipality of North Middlesex, (Former Township of West Williams)**

We acknowledge receipt of your correspondence regarding the above-noted matter and we advise of the following comments:

Ontario Regulation 147/06 (Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses)

We have no concerns with the scope of the work as presented in the report submitted to this office with regards to Ontario Regulation 147/06. We would like to remind the Municipality that as of February 2004, the ABCA has been charging a review fee of \$300 for reviews under Section 28 of the Conservation Authorities Act pertaining to new Municipal Drainage Reports. An invoice pertaining to this review is attached.

The existing Dewar-Thompson Drain is to be extended downstream from Lot 20, Concession ABCR, utilizing the existing privately constructed channel from Station 1+744 to Station 0+000 (West side of Elginfield Road).

Open Channel Construction:

A cleanout of the open channel will occur for a total of 1297m. From Stations 0+043 to Station 0+110, the cross section of the drain will be re-shaped to include 3:1 side slopes on both banks, and a 3 metre bottom. No bottom excavation is required downstream of approximately Station 0+130. From Station 0+110 to Station 0+419 (confluence with 16th Concession Drain), the drain will be constructed with a 3 metre bottom, and 3:1 side slopes on the north side only.

.../2

As discussed at a meeting with R. Dobbin Engineering and the Municipality of North Middlesex (November 15, 2018), a connection is going to be maintained to the old oxbow channel to provide additional water storage during high flow events, thereby reducing peak flows in the receiving natural watercourse.

In addition, the natural meanders of the channel will remain in place. In the "Design" section of the report, it is suggested that a provision be added that clearly states that the natural channel meander is to be maintained as such, including the natural bottom, specifically from Station 0+043 to Station 0+119. It is expected that there will be minimal alteration within the wetted width of the existing channel through this section.

Upstream of the confluence with the 16th Concession Drain (Station 0+419) through Station 1+340, a bottom cleanout of the existing ditch will occur, with the north bank shaved back to a more stable 2:1 slope. Additional works will include the removal of material from Station 1+470 to Station 1+590 to re-establish grade in the profile through that reach.

Specifications of Work

10. Excavation of Open Channel references a 1.5m setback for placed material. This distance should ensure that material is set back far enough to avoid re-entry into channel during a flooding event.

11. Bank stabilization will occur at 4 locations. The 4 locations are as follows:

Station 0+123
Station 0+176
Station 0+264
Station 0+578

12 and 13. With regards to future works, the ABCA understands the rationale behind including the design specifications and options in this report and is supportive of this approach. However, future works will need to be circulated to the ABCA as they may not fall under maintenance, and thus subject to the DART Protocol for drain maintenance. This letter does not cover future works, not completed under this construction tender.

✓ 17. This should read that "material shall not be placed in..."

Ontario Regulation 147/06

The following mitigation measures, in respect to Ontario Regulation 147/06 are intended to minimize the threat of downstream and site impacts, including erosion and flooding concerns. They are listed below for your information:

- (i) In accordance to Ontario Regulation 147/06 (Regulation of Development, Interference with Wetlands and Alterations to Shorelines and Watercourses), all spoil materials hauled away from the work site are to be taken to a non-regulated area unless prior written permission is given from an Officer of the ABCA.
- (ii) To minimize potentially negative impacts to the downstream water quality and in the receiving watercourse, works should take place during dry conditions.
- (iii) As noted in the report, erosion and sediment control measures should be installed prior to construction and remain in place until vegetation cover and work site becomes stabilized.
- (iv) There will be no increase in flows resulting from this drainage works. No increased erosion shall occur in the receiving watercourse as a result of these works.

Specific to works in the open channel portion (Construction):

- (v) Place brush, debris and sediment outside of the floodplain area in such a location as to minimize entry into the channel.
- (vi) Leveled spoil should be gapped in low run areas to allow for drainage of flood waters back into the watercourse.
- (vii) Perform work in appropriate flow conditions to minimize debris movement and erosion.
- (viii) Limit soil movement and erosion; use appropriate control measures before work begins and inspect and maintain those measures regularly until all disturbed areas are stabilized.
- (ix) Any natural areas of disturbed or bare soil should be seeded with native, non-invasive herbaceous material while the ground is moist and conditions are appropriate for germination.

Section 35: Federal Fisheries Act

This ABCA advice shall not be construed as any form of review or advice in regard to compliance with requirements under the Federal Fisheries Act. Please refer to the following links in regard to the requirements of the Federal Fisheries Act or Self Assessment process for project proponents.

<http://www.dfo-mpo.gc.ca/pnw-ppc/index-eng.html>

fisheriesprotection@dfo-mpo.gc.ca

Phone: 1-855-852-8320

Further, this correspondence does not release the proponent of the responsibility for obtaining any other permits that may be required under federal, provincial or municipal legislation.

Please be advised that Endangered Species could be present in this area and are protected under the Endangered Species Act (ESA 2007). Contact your local Ontario Ministry of Natural Resources office to ensure your proposal does not contravene the ESA 2007.

Additional information on species at risk can be found at www.mnr.gov.on.ca/en/Business/Species/index.html

I trust this information is clear. However, if you have any questions regarding the above, please do not hesitate to contact the undersigned at our office.

Yours truly,

AUSABLE BAYFIELD CONSERVATION AUTHORITY



Davin Heinbuck
Water Resources Coordinator
DH:dh

cc. **R. Dobbin Engineering Inc.**, Att: Michael Gerrits, P. Eng



Fisheries and Oceans
Canada

Pêches et
Océans Canada

Central & Arctic Region
Fisheries Protection Program
867 Lakeshore Road
Burlington, ON
L7S 1A1

Région centrale et de l'Arctique
Programme de Protection des Pêches
867 Chemin Lakeshore
Burlington, ON
L7S 1A1

March 4, 2019, 2019

Our file *Notre référence*

18-HCAA-01438

Municipality of North Middlesex
229 Parkhill Main Street
Parkhill, Ontario
N0M 2K0

Subject: Dredging, 16th Concession Drain and Dewar-Thompson Drain, Unrated, Municipality of North Middlesex – Implementation of Measures to Avoid and Mitigate Serious Harm to Fish and Prohibited Effects on Listed Aquatic Species at Risk

Dear Joanne Sadler:

The Fisheries Protection Program (the Program) of Fisheries and Oceans Canada (DFO) received your proposal on October 31, 2018. We understand that you propose to:

- Dredge the 16th Concession Drain to widen the drain to 1.5 m in width for 750 m; and,
- Dredge the Dewar-Thompson drain to widen the drain to 1.5 m in width for 1300 m.

Our review considered the following information:

- DFO Request for Review received on October 31, 2018;
- Drain Photos received on October 31, 2018; and,
- Drain reports for the 16th Concession Drain and Dewar-Thompson Drain received on October 31, 2018.

Your proposal has been reviewed to determine whether it is likely to result in serious harm to fish which is prohibited under subsection 35(1) of the *Fisheries Act* unless authorized. Your proposal has also been reviewed to determine whether it is likely to affect listed aquatic species at risk, any part of their critical habitat or the residences of their individuals in a manner which is prohibited under sections 32, 33 and subsection 58(1) of the *Species at Risk Act*, unless authorized.

To avoid and mitigate the potential for serious harm to fish as well as prohibited effects on listed aquatic species at risk, we recommend implementing the measures listed below:

- No in-water work between March 15 to July 15;
- Work in low or no flow conditions; and,
- Install or implement appropriate Erosion and Sediment Control measures.

Provided that you incorporate these measures into your plans, the Program is of the view that your proposal will not result in serious harm to fish or prohibited effects on listed aquatic species at risk. As such, an authorization under the *Fisheries Act* or a permit under the *Species at Risk Act* is not required.

Should your plans change or if you have omitted some information in your proposal, further review by the Program may be required. Consult our website (<http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html>) or consult with a qualified environmental consultant to determine if further review may be necessary. It remains your responsibility to avoid causing serious harm to fish and avoid prohibited effects on listed aquatic species at risk, any part of their critical habitat or the residences of their individuals.

It is also your *Duty to Notify* DFO if you have caused, or are about to cause, serious harm to fish that are part of or support a commercial, recreational or Aboriginal fishery. Such notifications should be directed to <http://www.dfo-mpo.gc.ca/pnw-ppe/violation-infraction/index-eng.html>.

Please notify this office at least 10 days before starting your project. A copy of this letter should be kept on site while the work is in progress. It remains your responsibility to meet all other federal, territorial, provincial and municipal requirements that apply to your proposal.

If you have any questions with the content of this letter, please contact Steve Cho at 905-336-6248 or by email at Steve.Cho@dfo-mpo.gc.ca. Please refer to the file number referenced above when corresponding with the Program.

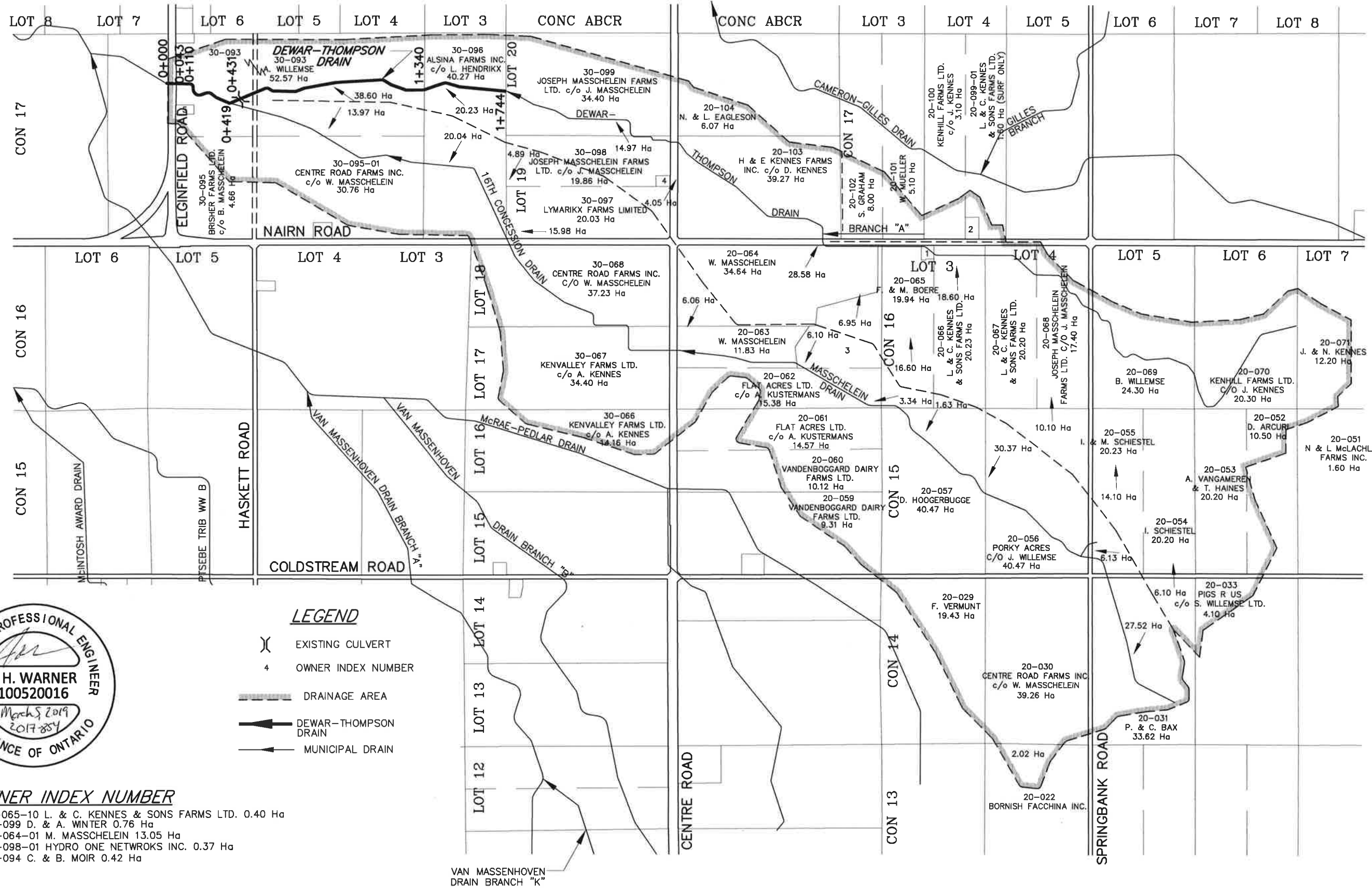
Yours sincerely,



Andrea Doherty
Senior Fisheries Protection Biologist

COPY:

Josh Warner, R. Dobbin Engineering Inc. (josh@dobbineng.com).



- LEGEND**
- () EXISTING CULVERT
 - 4 OWNER INDEX NUMBER
 - DRAINAGE AREA
 - DEWAR-THOMPSON DRAIN
 - MUNICIPAL DRAIN

- OWNER INDEX NUMBER**
1. 20-065-10 L. & C. KENNES & SONS FARMS LTD. 0.40 Ha
 2. 20-099 D. & A. WINTER 0.76 Ha
 3. 20-064-01 M. MASSCHELEIN 13.05 Ha
 4. 30-098-01 HYDRO ONE NETWORKS INC. 0.37 Ha
 5. 30-094 C. & B. MOIR 0.42 Ha



4218 Oil Heritage Road
 Petrolia Ontario, N0N 1R0
 Phone: (519) 882-0032 Fax: (519) 882-2233

DRAWING NAME:
 Dewar-Thompson Drain Plan

PROJECT No.
 2017-854

APPROVED	NO.	REVISIONS	DATE	BY
J. WARNER				
CHECKED	1	FINAL REPORT	MAR. 5, 2019	JW
B. VAN RUITENBURG				
DRAWN				
J. WARNER				

SCALE: 1:20,000
 0 200 400 600m

MUNICIPALITY of NORTH-MIDDLESEX

DEWAR-THOMPSON DRAIN
 PLAN

1
 OF 5

Last Updated: October 3, 2018



R Dobbin
Engineering Inc.

4218 Oil Heritage Road
Petrolia Ontario, N0N 1R0
Phone: (519) 882-0032 Fax: (519) 882-2233

DRAWING NAME:
Dewar-Thompson Drain Detailed Plan

PROJECT No.
2017-854

APPROVED	NO.	REVISIONS	DATE	BY
J. WARNER				
CHECKED	1	FINAL REPORT	MAR. 5, 2019	JW
B. VAN RUITENBURG				
DRAWN	SCALE 1:1250			
J. WARNER	0 10 20 30m			

MUNICIPALITY of NORTH-MIDDLESEX
DEWAR-THOMPSON DRAIN
DETAILED PLAN

2
OF 5

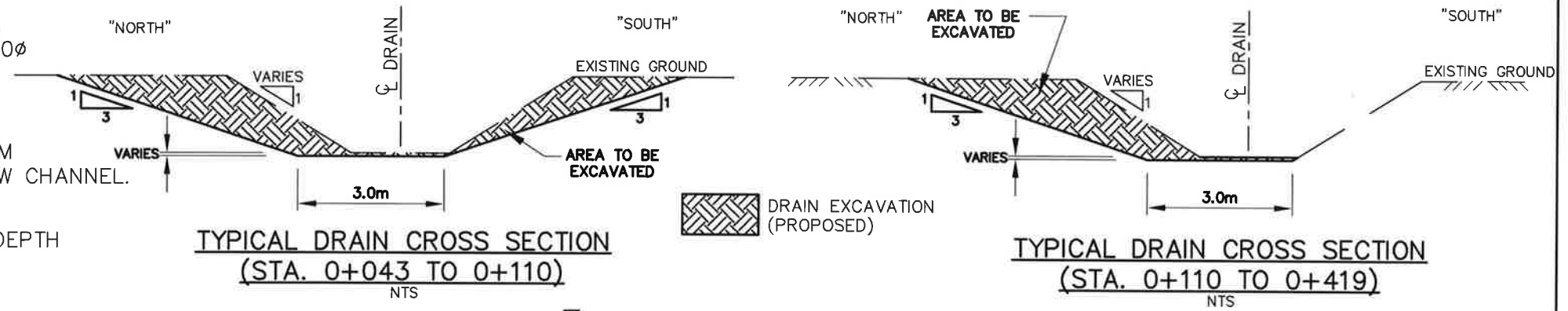
GENERAL NOTES

1. BENCHMARK No.1 ELEV. 201.90
TOP NORTHEAST CORNER OF EAST
END OF EXISTING 3100x3600mm
CONCRETE BOX CULVERT UNDER
ELGINFIELD ROAD

BENCHMARK No.2 ELEV. 201.81
TOP WEST END OF EXISTING 1600Ø
CSP, STATION 0+431

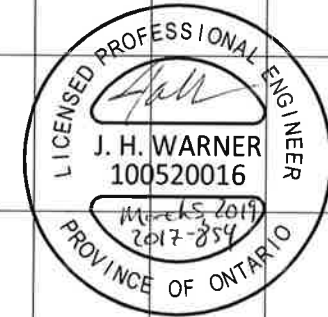
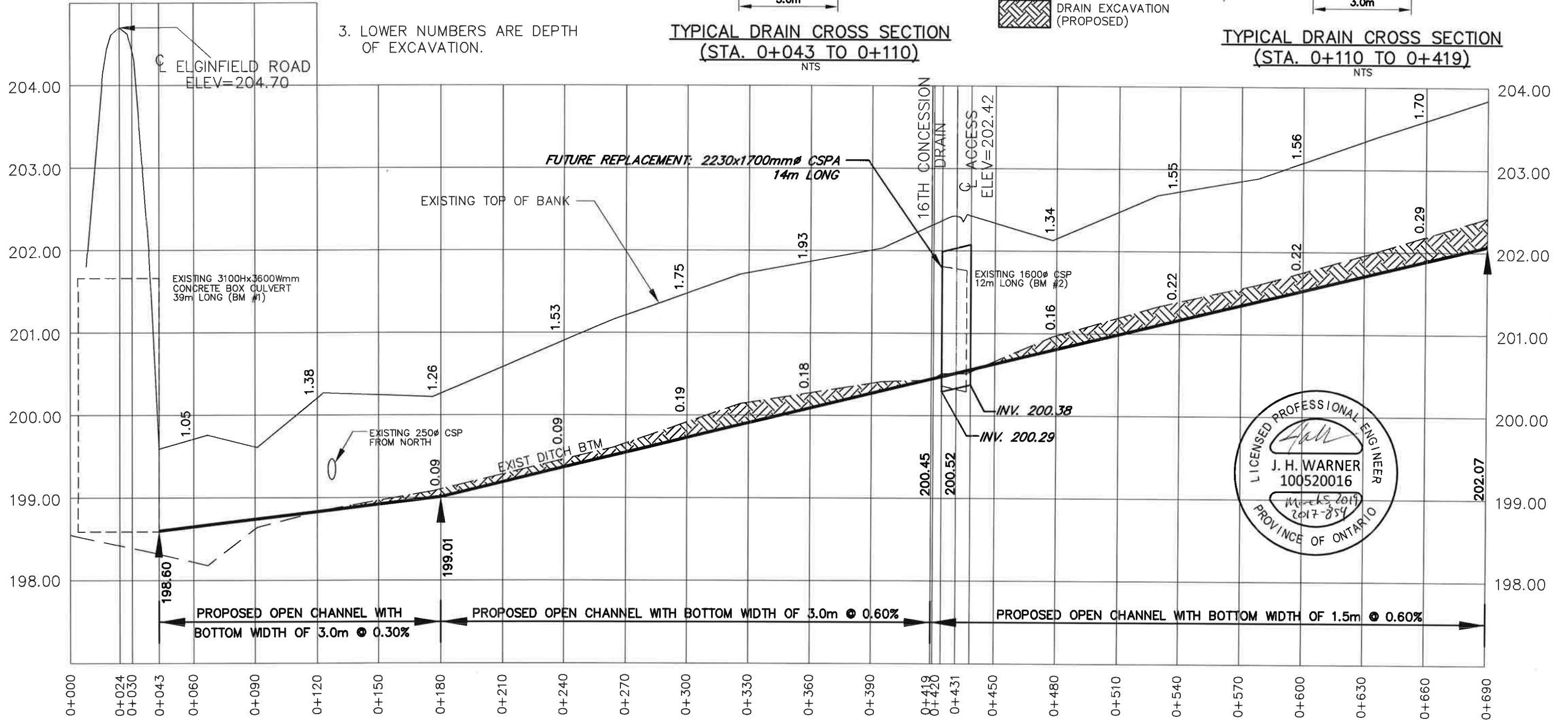
2. UPPER NUMBERS ARE DEPTH FROM
TOP OF BANK TO BOTTOM OF NEW CHANNEL.

3. LOWER NUMBERS ARE DEPTH
OF EXCAVATION.



TYPICAL DRAIN CROSS SECTION
(STA. 0+043 TO 0+110)
NTS

TYPICAL DRAIN CROSS SECTION
(STA. 0+110 TO 0+419)
NTS



4218 Oil Heritage Road
Petrolia Ontario, NON 1R0
Phone: (519) 882-0032 Fax: (519) 882-2233

DRAWING NAME:
Dewar-Thompson Drain Profile 1

PROJECT No.
2017-854

APPROVED	NO.	REVISIONS	DATE	BY
J. WARNER				
CHECKED	1	FINAL REPORT	MAR. 5, 2019	JW
B. VAN RUITENBURG				
DRAWN				
J. WARNER				

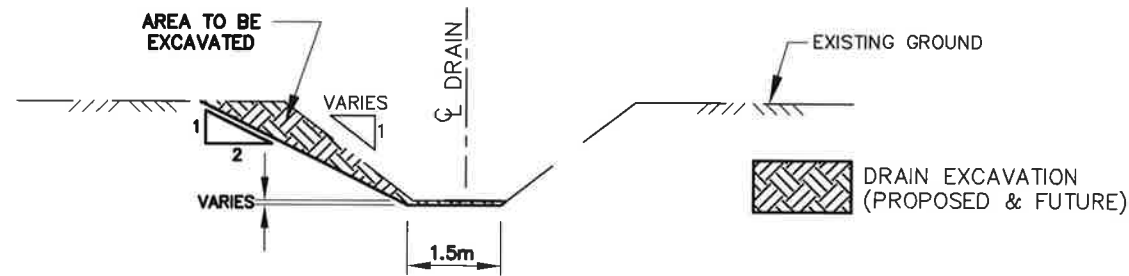
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MUNICIPALITY of NORTH MIDDLESEX
DEWAR-THOMPSON DRAIN
PROFILE

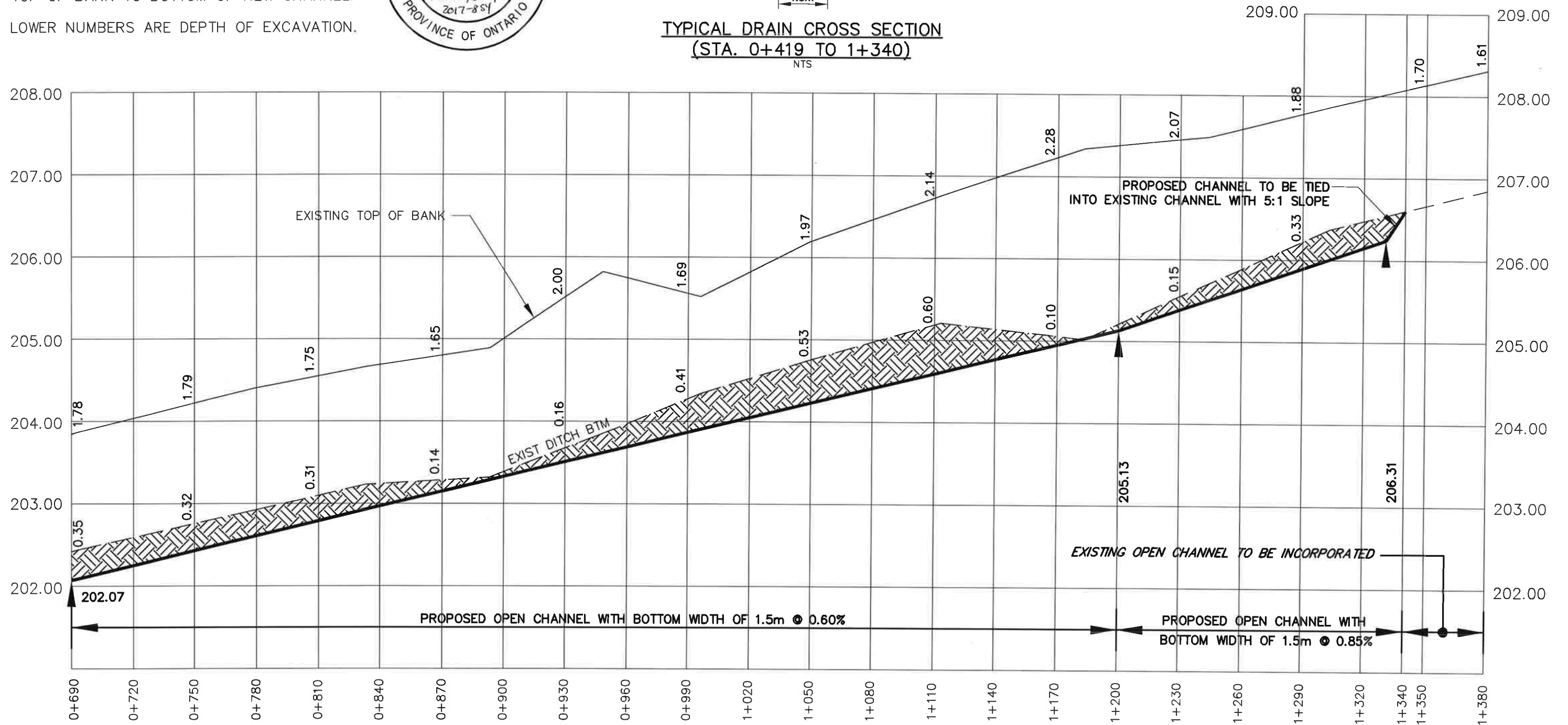
3
OF 5

GENERAL NOTES

- BENCHMARK No.2 ELEV. 201.81
TOP WEST END OF EXISTING 1600Ø
CSP, STATION 0+431
- UPPER NUMBERS ARE DEPTH FROM
TOP OF BANK TO BOTTOM OF NEW CHANNEL.
- LOWER NUMBERS ARE DEPTH OF EXCAVATION.



TYPICAL DRAIN CROSS SECTION
(STA. 0+419 TO 1+340)
NTS



4218 Oil Heritage Road
Petrolia Ontario, N0N 1R0
Phone: (519) 882-0032 Fax: (519) 882-2233

DRAWING NAME:
Dewar-Thompson Drain Profile 2

PROJECT No.
2017-854

APPROVED	NO.	REVISIONS	DATE	BY
J. WARNER				
CHECKED	1	FINAL REPORT	MAR. 5, 2019	JW
B. VAN RUITENBURG				
DRAWN	SCALE: 1:2,000			
J. WARNER	0 20 40 60m			

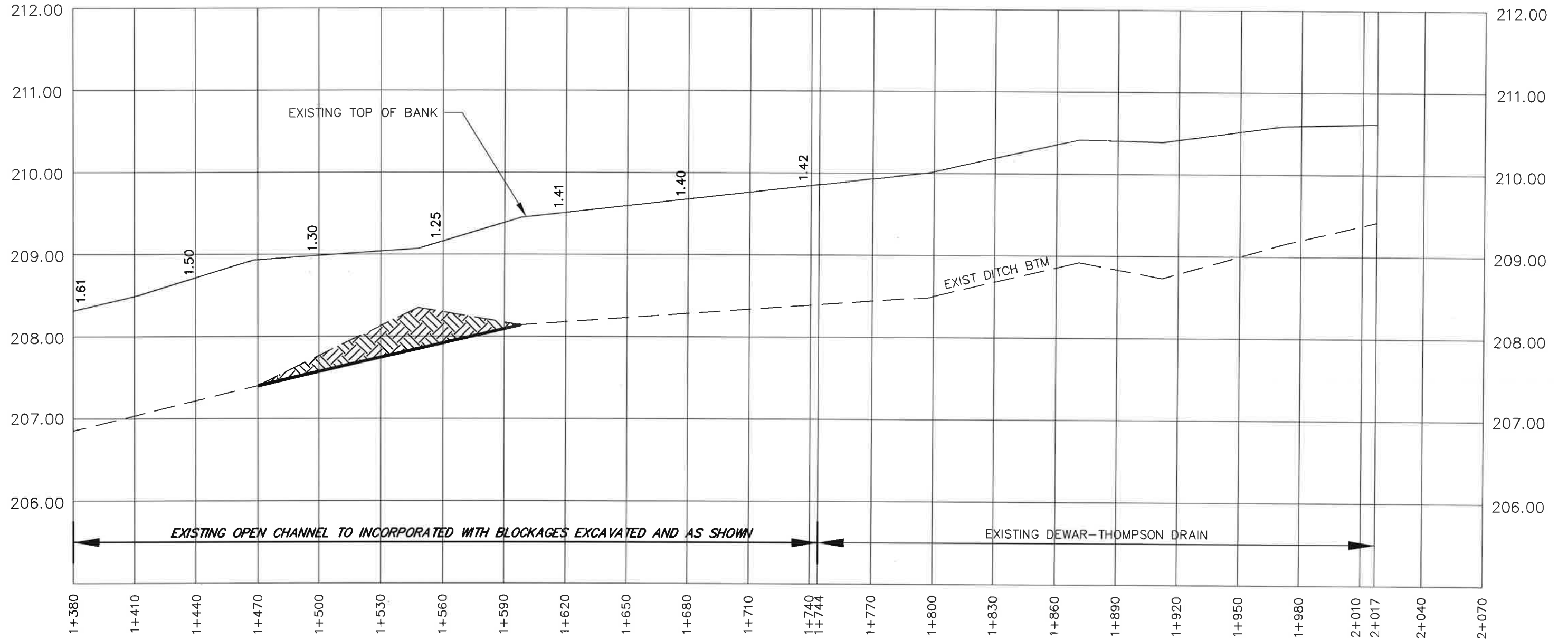
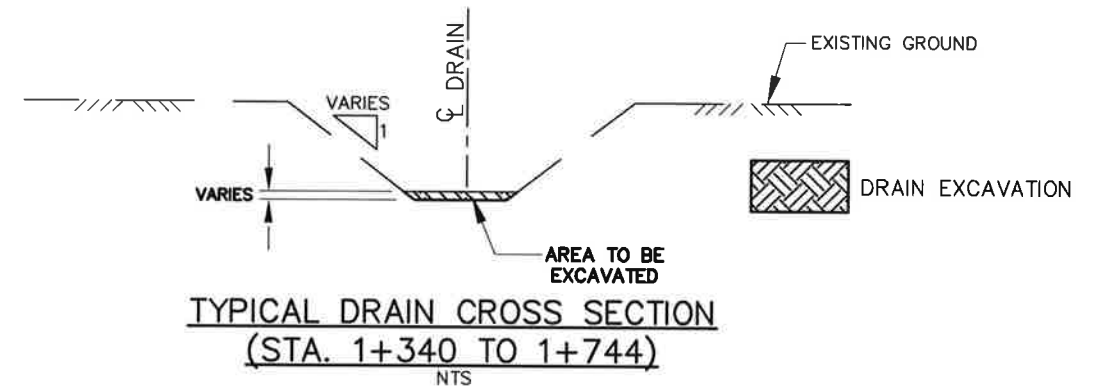
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DEWAR-THOMPSON DRAIN PROFILE

4
OF 5

GENERAL NOTES

1. BENCHMARK No.2 ELEV. 201.81
TOP WEST END OF EXISTING 1600Ø
CSP, STATION 0+431
2. UPPER NUMBERS ARE DEPTH FROM
TOP OF BANK TO BOTTOM OF NEW CHANNEL.



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DRAWING NAME:
Dewar-Thompson Drain Profile 3

PROJECT No.
2017-854

APPROVED	NO.	REVISIONS	DATE	BY
J. WARNER				
CHECKED	1	FINAL REPORT	MAR. 5, 2019	JW
B. VAN RUITENBURG				
DRAWN				
J. WARNER				

SCALE: 1:2,000
0 20 40 60m

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DEWAR-THOMPSON DRAIN
PROFILE

5
OF 5