WATERCOURSE REALIGNMENT

5205 KING ST, BEAMSVILLE

TOWN OF LINCOLN

ENVIRONMENTAL IMPACT STUDY

Prepared For: URBANLINK DEVELOPMENTS (BEAMSVILLE) LIMITED.



JULY 2023

MYLER ECOLOGICAL CONSULTING

ENVIRONMENTAL IMPACT STUDY

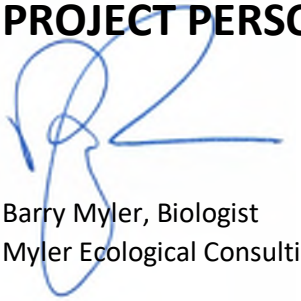
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PROJECT PERSONNEL:



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Myler Ecological Consulting

21 JULY 2023

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INTRODUCTION

Myler Ecological Consulting (Myler) was retained by Urbanlink Developments (Beamsville) Ltd. (Urbanlink) to prepare an Environmental Impact Statement (EIS) in support of an application for a Niagara Peninsula Conservation Authority (NPCA) permit for the proposed realignment of the two watercourse segments (Konkle Creek Tributaries 1B and 2A) that cross the property at 5205 King St., Beamsville, Town of Lincoln, Ontario (the site), the location and extent of which is depicted on **Figure 1**, below.



Figure 1: Location of the site at 5205 King Street, outlined in red, on an excerpt of NPCA Watershed Explorer on-line mapping showing the Konkle Creek Tributary 1B and 2A watercourse segments (thin blue lines), their floodplains (blue shading), and their associated regulated area (light blue-green shading).

AGENCY CONSULTATION

Consultation with NPCA included site visits on 18 May 2022 with Watershed Planner Taran Lennard and on 04 July 2022 with Ecologist Theresa Bukovics and Taran Lennard, to discuss the proposed realignment project and to determine EIS scope. Myler submitted to NPCA an EIS Terms of Reference (ToR) to address the NPCA Interim EIS Guidelines. The approved ToR is provided in **Appendix 1**.

As potential design alternatives were assessed and a preferred design was emerging that would preserve both watercourses as separate, but adjacent, open channels, and would maintain the flood characteristics of each, a virtual meeting was held on 26 August 2022 with NPCA's Steve Miller (Senior Manager, Infrastructure Engineering), Theresa Bukovics, and Taran Lennard, during which Steve Miller confirmed that the approach appeared to be reasonable from an engineering perspective.

Further consultation with NPCA addressed the Niagara Region decision to abandon relocation of the Tributary 2A culvert crossing as part of planned upgrades to King Street, which introduced the requirement to include an

enclosure of a portion of the realigned Tributary 2A along King Street. Preliminary design drawings were shared with NPCA in November 2022, along with Myler's 22 November 2022 letter that outlined a preliminary assessment of the enclosure's potential benefits and lack of negative ecological and fish habitat impacts. A virtual meeting was held on 08 December 2022 with Steve Miller, Theresa Bukovics, and NPCA Watershed Planner Mani Drummond to resolve NPCA questions and comments about the enclosure.

Concurrent with the November-December NPCA consultation and reflecting the realignment design with the partial enclosure of Tributary 2A along King Street, Myler submitted a Request for Review to the federal Department of Fisheries and Oceans (DFO) on 15 November 2022. DFO responded with questions about construction dates and issued a Letter of Advice on 22 December 2022 that concluded the watercourse realignment as proposed would not contravene the federal Fisheries Act through the death of fish by means other than fishing, the harmful alteration, disruption, or destruction of fish habitat (HADD), or effects to listed aquatic species at risk (SAR). The Request for Review and the DFO Letter of Advice are provided in **Appendix 2**. Urbanlink subsequently submitted the final revised realignment plan to DFO on 19 May 2023 and received confirmation that same day from DFO's Michael Bedford that the minor changes to the plan that was originally reviewed by DFO did not impact the conclusions of the original Letter of Advice and therefore the Letter of Advice remained valid.

NATURAL HERITAGE CONSTRAINTS AND OPPORTUNITIES

Existing Information Review

Existing information review included online mapping of the Provincial Natural Heritage Information Centre (NHIC), DFO online aquatic SAR mapping, NPCA's online Watershed Explorer and ELC mapping, and natural heritage mapping on Town and Region Official Plan (OP) schedules. Citizen science websites eBird and iNaturalist were visited to check for notable observations, but the site is not included within or close to birding "hotspots" registered by users of eBird and iNaturalist users near the site had only reported rather mundane species with no relevance to the site and the assessment of the realignment project.

NHIC mapping shows no woodland or wetland at the site, and only Tributary 2A, the easterly, larger, and more distinct of the two watercourses, is mapped. NHIC mapping shows the site within the Beamsville settlement area limits as the "Greenbelt Towns and Villages" designation within the broader Greenbelt Protected Countryside.

Review of NHIC species at risk (SAR) records in the vicinity if the site revealed the following species:

- Snapping Turtle (Special Concern)
- Blanding's Turtle (Threatened)
- Short-eared Owl (Special Concern)
- Eastern Meadowlark (Threatened)
- Barn Swallow (formerly Threatened, recently reclassified Special Concern)
- American Chestnut (Endangered)
- Cucumber Tree (Endangered)

The potential occurrence at the site of each of these species is addressed in the SAR screening section of this EIS.

DFO online aquatic SAR mapping shows no critical habitat and no SAR "found (or potentially found)" at or near the site or anywhere within the Konkle Creek watershed upstream/south towards the Niagara escarpment or downstream/north to its mouth at Lake Ontario.

NPCA Watershed Explorer online mapping (**Figure 1**, above) shows the two watercourse segments on the site as regulated features with associated regulatory floodplain. There are no mapped regulation wetlands or slope hazard features at or near the site. NPCA's online 2011 ELC Community Class Series mapping (**Figure 2**, below) shows "THD" = Deciduous Shrub Thicket as narrow corridors on each of the two watercourse segments at the site. Off-site to the north, patches of wooded area are mapped as "TAG" = Treed Agricultural.

Watershed Explorer mapping shows the westerly Tributary 1B watercourse as regulated only as far upstream as King Street, and with only a very narrow/small floodplain. Upstream/south of the site 1B is mapped as a minor drainage feature whose upstream limit terminates in vineyards before reaching the Niagara escarpment. Downstream of the site, 1B is mapped outside of the Beamsville settlement area, into rural lands of the Greenbelt Protected Countryside west of the residential properties along Lincoln Avenue. The easterly Tributary 2A watercourse and its regulated area is mapped as a channelized drainage ditch through vineyards upstream to the Niagara escarpment and extending above the escarpment as a headwater drainage feature that originates in crop fields, woodland, and a small wetland area. At and downstream of the site it is channelized and diverted eastwards into the western roadside ditch along Lincoln Avenue for approximately 650 metres before crossing Lincoln Avenue and joining Konkle Creek near Greenlane.



Figure 2: Excerpt of NPCA ELC Community Class Series vegetation community mapping showing a narrow strip of deciduous thicket along each of the watercourse segments at the site, terminating at King Street.

The 2014 Niagara Region OP Schedule C – Core Natural Heritage maps the blue line of Fish Habitat on Tributary 2A at, upstream of the site to the Niagara escarpment and downstream of the site to Lake Ontario, as the sole designated natural heritage feature at and near the site. The on-line mapping of the Natural Environment System (NES) of the current 2022 Niagara Region OP (excerpt on **Figure 3**, below) applies the designation "Other Woodlands" extending in a narrow strip along Tributary 2A segment, at the north end of the Tributary 1B segment, and on portions of the lands north of the site. Similar to the 2014 OP mapping, only Tributary 2A is mapped as "Permanent & Intermittent Streams", with Tributary 1B remaining unmapped by the Region.



Figure 3: Excerpt of online Niagara Region NES mapping, showing Other Woodlands (green) along the Tributary 2A segment (blue line), at the north end of Tributary 1B (not shown on Region OP mapping), and extending along the northwest site boundary and off-site to the north.

Town of Lincoln OP Schedules revealed the following designations at the site:

- Schedule A2 shows a broad "bulb" of Natural Environment designation on Tributary 2A segment and a narrow strip of Natural Environment on Tributary 1B.
- Schedule E4 confirms that the Natural Environment designation on Schedule A2 corresponds to Natural Hazard, the regulatory floodplain, associated with each of the watercourses.
- Schedule E2 Environmental Conservation Area maps Tributary 2A as Fish Habitat, the sole Environmental Conservation Area designated feature at and near the site. Unlike the 2014 Regional OP mapping, the Fish Habitat designation is not mapped upstream/south of King Street.

Accordingly, only Tributary 2A is designated Fish Habitat. And the only other natural heritage designation applicable to the watercourses at the site is the Other Woodland that was recently mapped as part of the 2022 Niagara Region OP NES mapping.

Biophysical Inventory

Field studies at the site addressed all the NPCA Checklist items per the ToR, as described in the sections below.

The site setting, context and connectivity of the watercourse segments is important and is described below, with representative photographs included to depict the conditions that were observed.

The aquatic habitat, such as it is, was investigated to identify habitat features and fish presence per applicable elements of the Ontario Stream Assessment Protocol and described for each of the Tributary 1B and 2A watercourse segments at the site. Fish presence/absence was assessed visually, as allowed by the diminutive dimensions, clear water, and lack of instream cover within Tributary 2A, and extended off-site and down Lincoln Avenue to determine whether fish migrate to or are resident within 2A at and downstream of the site. Fish presence was not an issue for Tributary 1B, as it clearly lacks aquatic habitat features at the site.

Botanical investigations included vegetation community mapping within the site limits and the immediately adjacent municipally owned lands north of the site. Botanical inventory was based on observations that spanned winter, spring, summer, and late summer / early autumn, as described further below.

Breeding birds were studied per the Ontario Breeding Bird Atlas methods. All other wildlife were addressed incidentally and through screening for habitat suitability/potential. As an example, no turtle habitat or snake overwintering habitat was observed, and neither turtles nor snakes were observed incidentally despite numerous site visits. Similarly, no terrestrial crayfish or their burrows were observed.

SAR and significant wildlife habitat (SWH) screening is described below. The SAR screening combined consideration of existing records of local SAR occurrences with Myler's on-site observations of plants, wildlife, and habitat features. The SWH screening followed guidance provided in the provincial Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E and, like the SAR screening, was based on observations of plants, wildlife, and habitat features at the site.

Site Setting

Myler first visited the site on 11 February 2022 to observe site conditions of the watercourses and their riparian areas. The 1934 air photo shows the site was historically part of an orchard and that the watercourses were already channelized across it at that time. The site includes the existing commercial plaza within its easterly extension at the intersection of King Street and Lincoln Avenue. The westerly balance of the site is a flat open field with no structures except for a gravel parking pad west of the plaza. Otherwise, the site is mostly mowed turfgrass bisected by Tributary 2A and its narrow treed riparian corridor that is dominated by young Manitoba Maple and Black Walnut.

Tributary 1B is a channelized straight ephemeral swale with no sign of substantial or sustained flow. This is not surprising given its limited upstream catchment area. The swale is comprised of turfgrass that grades to unmanicured meadow and shrub thicket to the north. Signs of erosion, down-cutting, or lateral migration of the swale were absent, and it appears that ephemeral flows are accommodated atop the turfgrass.

Tributary 2A, by contrast, is a deeper, channelized straight trench cut into what appears to be clayey and rubbly historically imported fill that covers much of the site. With its larger catchment, it appears to convey flows that have been sufficient to cut or to maintain the deep, straight, and narrow trench of a channel. There is no sign of

lateral flooding outside of the deep north-south segment of Tributary 1B. Large concrete slabs were observed to have been placed to armor the outside of the artificial bend where the watercourse is directed eastward towards Lincoln Avenue. At and downstream of the bend, the watercourse is not so deeply incised, and it appears that periodic flooding could occur outside of the narrow channel.

Each of the watercourse culvert crossings at King Street appear to barriers to upstream fish passage. Tributary 1B appears unlikely to host fish at any time, having apparently diminutive flow and no defined channel or cover for fish. Tributary 2A, although of marginal character and quality, appeared to have the potential for seasonal or episodic occurrence of fish, if fish could in fact reach the site.

A selection of site photos is provided below for reference.



Photo 1: Facing northeast across the site from its southwest corner at King Street. Head of Tributary 1B in foreground. Narrow treed riparian corridor of Tributary 2A in background.



Photo 2: Facing north, down Tributary 1B. Note the turfgrass channel, weedy east bank, and signs of a recent minor flow event. Note the flat fill pad of the site in the right background.



Photo 3: Facing west across the Tributary 2A channel. Note the sparsely distributed trees and the depth of the channel.



Photo 4: Another segment of Tributary 2A, showing the steep, narrow channel cut down through historically placed fill and rubble.



Photo 5: The small King Street culvert that is the source of flow on the site for Tributary 1B.



Photo 6: Tributary 1B culvert inlet on the south side of King Street receives only roadside ditch drainage and whatever flow is conveyed in the small buried pipe on the vineyard.



Photo 7: The Tributary 2A culvert is larger, with a concrete floor/sill perched above a small plunge pool. The culvert is a barrier to upstream fish migration, compounded by a similarly impassable culvert on the vineyard upstream.



Photo 8: Tributary 2A where it enters and becomes the Lincoln Avenue roadside ditch.



Photo 9: The Lincoln Avenue roadside ditch (Tributary 2A) further downstream, facing upstream or south towards the site. At some point or points along the road, the ditch loses flow to the underground storm sewer beneath the road, leaving downstream reaches dry or only a trickle.



Photo 10: The dry Tributary 1B, mowed and with one weedy bank in June 2022.



Photo 11: Tributary 2A in June, with no flow and mostly dry except for a few very small pools.



Photo 12: A close-up of the Tributary 2A riparian corridor, showing its young trees and shrubs next to mowed grass.



Photo 13: Tributary 2A riparian corridor viewed from across King Street, showing its narrow character and very young trees.

Aquatic Habitat Assessment

Aquatic habitat features were observed and photographed to support descriptions of fish habitat as applicable per the habitat elements of the Ontario Stream Assessment Protocol and to determine fish presence/absence on the following dates:

- 11 February 2022 – initial reconnaissance of channels, upstream culverts, and downstream conditions. Fish habitat potential judged to be nil on-site in Tributary 1B, but possible in Tributary 2A despite apparent barriers. No fish observed.
- 18 March 2022 – site visit prior to forecast rain. No flow in 1B. Clear pools and low trickle of flow in 2A, including the downstream Lincoln Avenue roadside ditch. No fish observed.
- 19 March 2022 – site visit following overnight rain. Hardly a trickle in 1B. Turbid flow in Tributary 2A obscured observations for fish.
- 21 March 2022 – follow-up site visit to observe cleared water in Tributary 2A for fish presence. No fish observed.
- 11 April 2022 – flow of clear water in Tributary 2A. No fish observed. Flow ceases in Lincoln Avenue ditch downstream of the northernmost new driveway culvert, but flow can be heard in the adjacent underground storm sewer, indicating a connection or leak between the ditch and the sewer.
- 05 May 2022 – virtually no flow in 1B. Good flow in Tributary 2A, clear water, but no fish observed.
- 17 May 2022 – zero flow in 1B. Clear flow in Tributary 2A. No fish, frogs, or turtles observed.
- 18 May 2022 – NPCA site visit with Watershed Planner, Taran Lennard. Still no fish observed.
- 16 June 2022 – zero flow in 1B. Clear trickle of flow in Tributary 2A, reaches Lincoln Avenue roadside ditch but does not persist past the northernmost new driveway culvert (trickle in adjacent storm sewer can be heard). Fish observed on site (two juvenile Creek Chub ~100mm length in a single small pool). Fish observed downstream in a stagnant section of Lincoln Avenue roadside ditch in vicinity of 4478 and 4486 Lincoln Avenue (three tiny, young-of-the-year, Creek Chub ~20mm length).
- 01 July 2022 – zero flow in both watercourses. No fish observed in Tributary 2A or in Lincoln Avenue roadside ditch.
- 04 July 2022 – NPCA site visit with Taran Lennard and NPCA Ecologist, Theresa Bukovics. No flow in either watercourse. Only very small, very shallow remnant pools observed in Tributary 2A. No fish observed.

These observations of the two watercourse segments at the site were used to identify whether, and to what extent, they may contain aquatic habitat and fish habitat that would need to be considered, protected, and restored as part of the realignment design.

The Tributary 1B segment at the site was observed to be a mowed turfgrass swale contained within a straight channelized ditch located between the historical fill on the site and the filled westerly neighbouring site. While it serves an intermittent or ephemeral conveyance function, it has no aquatic habitat features and no features of direct fish habitat. Observations on the listed dates confirmed that intermittent or ephemeral flows within 1B are of small magnitude and duration, owing to the small upstream catchment. No substantial flows were observed within it, and the uniform channel grade does not allow for standing water. As such, the terrestrial turfgrass on the ditch bottom is maintained without being drowned and no eroded low-flow channel has developed within Tributary 1B on the site. Air photo review identified an online artificial irrigation pond approximately 800 metres downstream (north) of the site on 4556 Lincoln Avenue, that would likely be a barrier

to upstream fish migration towards the site. Additionally, the observed flow, channel, and "instream" cover conditions in Tributary 1B at the site are not conducive to fish presence and although the King Street culvert is not perched and may be passable, the watercourse is enclosed in a pipe on the vineyard across King Street, so there's nothing to attract fish upstream and nowhere for fish to go.

Tributary 2A has a larger catchment that extends up to Niagara escarpment and includes lands above the escarpment but was also observed to have only an intermittent flow regime, although with observed flows of greater apparent magnitude, frequency, and duration than those of Tributary 1B. Tributary 2A's channel was observed to be more substantial, with potential refuge pools that could support fish between periods of flow. So, it was important as input to assessment and design of the proposed realignment to investigate the fish habitat potential and function within the on-site segment and to determine fish presence/absence and, if present, to discover which fish species might inhabit Tributary 2A at the site.

The culvert at King Street is a perched barrier to upstream fish passage within Tributary 2A south of and beyond the site. Observations through the site, downstream along the Lincoln Avenue roadside ditch, the Lincoln Avenue culvert far north of the site, and air photo review further downstream, indicated a potential for upstream fish migration to the site. Observations on the dates listed above confirmed that flow in Tributary 2A is intermittent, and that when there is no flow the extent of refuge pools is limited to a few very small and shallow puddles along the channel. Flow in the roadside ditch downstream of the site along Lincoln Avenue was likewise observed to be intermittent, with the added wrinkle of apparent loss of some flow to the underground storm sewer in front of the new homes on Lincoln Avenue, so that sometimes there was no flow observed in the ditch north of the new driveway culverts. So any fish that could possibly migrate upstream to the site from lower in the Konkle Creek system would need to navigate the intermittent conditions in the open roadside ditch and would then be dependent on the small, shallow refuge pools to survive between flow events. And any such fish would not find functional spawning habitat because of the lack of sustained flow and of suitable spawning substrates.

The channel characteristics of Tributary 2A are best described as those of a ditch rather than a natural watercourse. The 1934 air photo shows the watercourse channelized through an orchard, so whatever its possible natural origin the watercourse has existed in an altered state and function for a very long time. The north-south channel segment runs in a straight line for approximately 106 metres from the King Street culvert outlet to the northern property boundary where it is then directed eastwards in a similarly channelized but shallower ditch towards Lincoln Avenue. The roughly trapezoidal north-south channel is about 8 metres across at the top, with steep, eroded sides and a 2-3 metre wide bottom, within which a low flow channel of approximately 1-2 metres width is contained. The eroded banks within the channel reveal historically placed clayey fill that contains brick, concrete and stone rubble, and wood and metal scrap. Channel substrate is bed clay with thin deposits of sand and gravel sized stone and scattered larger brick, concrete and stone rubble. The gravel deposits could be candidate fish spawning habitat under other circumstances, but the observed flow conditions are intermittent and generally so low that the gravel is frequently exposed during the spring and early summer spawning season. The pools along the channel are tiny and lack sufficient cover and permanency in the intermittent flow regime to provide spawning habitat for species that do not spawn on gravelly riffles.

Although there appears to be a physical potential for upstream fish migration to the site, the corresponding biological occurrence of such migration was not observed. Seasonal observations throughout the spring and into early summer, when upstream migration occurs, failed to discover any evidence of it, which would have been

obvious as numbers of migrating fish observed in the generally clear waters of the Lincoln Avenue roadside ditch and potentially within the clear waters of Tributary 2A segment at the site. The substrate and flow conditions within the on-site channel and in the Lincoln Avenue roadside ditch are not conducive to successful fish spawning. Better options for spawning fish exist elsewhere within the Konkle Creek system.

Given Tributary 2A's characteristics, setting/connectivity, and flow conditions, it would not have been surprising for fish to be entirely absent and for the channel to be nothing more than a conveyance feature. Repeated observations during late winter, throughout spring, and into early summer when flows ceased, were undertaken to confirm fish presence/absence and inferred use of the watercourse by fish as input to the assessment of the proposed realignment and to guide the realignment design. The only fish observed were the few individual juvenile Creek Chub that were discovered on only one date (16 June 2022), as noted above. These observations, of only a few scattered juvenile fish and only fleetingly and without repeat, are not indicative of upstream migration and spawning, or of residence on the site. The sightings of the small Creek Chub are instead indicative of incidental occurrence of small fish washed down from remnant upstream fish habitat located above the vineyard in the remnant natural segment of channel at the foot of the escarpment where a population of Creek Chub could persist. Unfortunately, because the King Street culvert is a barrier to upstream migration, those displaced Creek Chub probably cannot return upstream to their natal habitat and, if they survive no-flow periods in the watercourse on site and in the Lincoln Avenue roadside ditch, are forced to make their way downstream to permanent habitat in Konkle Creek.

So, the aquatic habitat / fish habitat function of the respective watercourses can be summarized as follows:

- Tributary 1B: simple conveyance of intermittent flow. Aquatic/fish habitat is absent. Its characteristics are those of a simple headwater drainage feature (HDF) for which removal, enclosure, or realignment could reasonably be proposed.
- Tributary 2A: conveyance of intermittent flow plus intermittent downstream displacement and temporary refuge/occurrence of juvenile Creek Chub with no option to but to go further downstream. Aquatic/fish habitat is marginal at best, corresponding to MNRF Type 3 (Marginal) Fish Habitat and not meeting criteria to be designated Type 2 (Important) Fish Habitat. In consideration of the upstream and incidental on-site occurrence of fish, and of a more substantial albeit intermittent flow regime, its characteristics are those of a marginal fish habitat.

Neither watercourse possesses sensitive fish spawning or nursery habitats at the site. Neither watercourse supports upstream fish migrations to the site, or beyond the site across King Street. Neither watercourse contains resident fish at or near the site. As such, neither watercourse presents complex issues of habitat form, feature, or function to be solved in the realignment design. The realignment design will simply need to preserve conveyance, avoid exacerbating flood conditions, and be able to continue to temporarily host downstream-displaced fish within Tributary 2A.

Vegetation Community Mapping and Botanical Inventory

Vegetation community investigations were initiated to characterize the vegetation communities according to the Ecological Land Classification (ELC) for Southern Ontario, beginning with site reconnaissance, and with spring, summer and late summer / early autumn observations conducted on:

- 11 February 2022 – Reconnaissance of site conditions and vegetation communities.
- 17 May 2022 – Spring.
- 04 July 2022 – Summer.
- 07 September 2022 – Late Summer / Early autumn.

As the entire site is historically placed fill, mostly covered by mown turfgrass, with natural vegetation growing on fill, and lacking wetland features, soil sampling was not required to characterize the vegetation communities. The vegetation communities observed at the site are depicted on **Figure 4**, below, and are described further below.

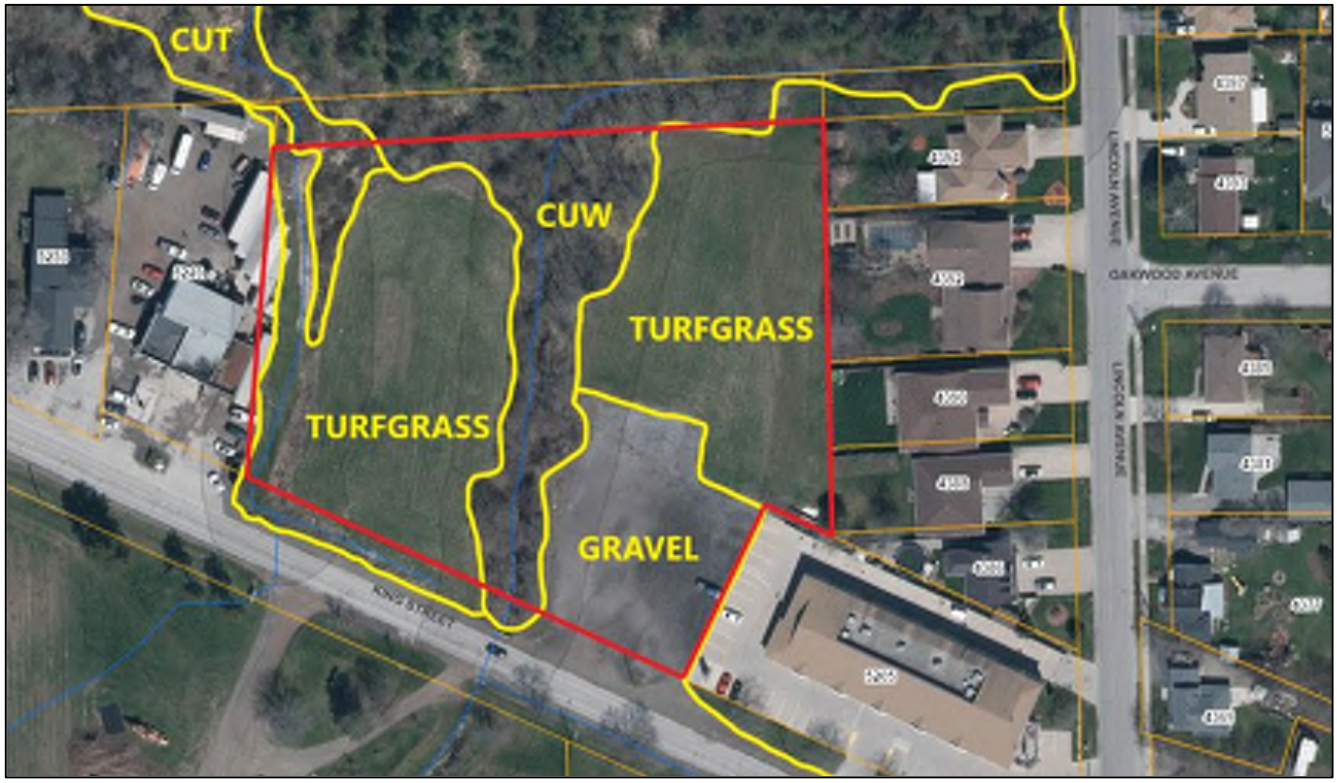


Figure 4: ELC vegetation community mapping of the site shows Cultural Woodland (CUW) in a narrow riparian corridor along Tributary 2A, Cultural Thicket (CUT) on parts of Tributary 1B, and otherwise maintained turfgrass and a gravel parking lot.

The entire site is filled and was historically an orchard with what appears to be buildings (house and barn?) east of Tributary 2A where there is currently a large gravel parking pad. The open area of the site west of the plaza was observed to be mostly mowed turfgrass and the large gravel parking pad. Natural vegetation communities are confined to the watercourse riparian areas and the site's northern limit as follows:

- Cultural Woodland (CUW): A narrow fringe of deciduous trees and shrubs extends southward along Tributary 2A from the planted rows evergreens and scattered "volunteer" deciduous trees that occur in a small block north of the site. The entire site and neighbouring lands were historically orchards, but there is no sign of remnant orchard. Between the east and west mowed turfgrass and gravel areas on the site, young specimens of Manitoba Maple and Black Walnut line the filled and channelized banks of Tributary 2A. The trees are sparsely distributed and the corridor very narrow, such that it would not

satisfy definitions of Forest, and is rather Cultural Woodland or "Other Woodland" as designated by Niagara Region, except that much of the corridor is <20m wide and would therefore not meet the minimum width criterion that defines "Other Woodland". Nevertheless, the narrow strip of trees, whatever its designation, comprises a vegetated riparian corridor along Tributary 2A that would otherwise be mowed turfgrass. Beneath the trees is shrubby, open, weedy ground, with specimens of native Black Raspberry, Riverbank Grape, and Virginia Creeper but many more non-native shrubs including Common Buckthorn, Multiflora Rose, Sweetbrier, Tatarian Honeysuckle, and Privet. The herb layer is likewise dominated by non-native species, with only 20 of 44 observed species native and invasives such as Burdock, Dame's Rocket, and Garlic Mustard not over-running the riparian area but well established and abundant within it. A few watercourse/wetland plants such as Spotted Jewelweed and the introduced Reed Canary Grass and Moneywort occur in the bottom of the channel, where intermittent flow sustains them. But given the narrowness of the channel bottom and the steepness of the eroded banks, the extent of wetland vegetation is negligible and there is no wetland vegetation community.

- Cultural Thicket (CUT): Unlike Tributary 2A, the path of Tributary 1B across the site is not flanked by trees. On the site, the watercourse is mostly a mowed turfgrass swale, with a bit of shrubby Rose, Gray Dogwood, and Raspberry on part of its east bank. Just before it leaves the site, and extending northwards, Tributary 1B occupies a swale of unkempt weedy meadow and scattered shrubs. Numbers of native and non-native species are roughly similar in the unmowed portion of the swale. As flow conditions in the swale appeared to be miniscule, there was no notable occurrence of wetland vegetation along Tributary 1B.

68 vascular plant species or hybrids were observed within the Cultural Thicket and Cultural Woodland riparian areas of the two tributaries. Trees are represented by 9 species, of which 5 are native. Shrubs and woody vines total 15 species, of which 10 are native. Of the 44 herbaceous plants, many are introduced weeds and only 20 are native species. In total, about half or 35 of the 68 species/types of plants are native, (see list in **Appendix 3**). The Cultural Thicket and Cultural Woodland on the site are dominated by upland species, with a few wetland species showing up at the bottom of the watercourse intermittent channels.

No SAR plants were observed. No plants were observed that are listed as rare native species in the Niagara Region Natural Areas Inventory (2010) (the "NAI"). Two regionally uncommon native species were observed, a specimen or two of Eastern White Cedar, and scattered specimens of Wild Garlic, each of which is nevertheless designated S5. None of the vegetation communities at the site are designated as rare, such that they might possibly be SWH.

Breeding Bird Survey

The breeding bird survey was conducted using Ontario Bird Atlas methods as a roving survey (as opposed to fixed point-count locations) conducted around the small site, on the following dates:

- 16 June 2022 – 28^{o}C, moderate breeze, sunny, hazy, 0800

- 04 July 2022 – 22°C, calm, sunny, clear 0940

Thirteen bird species were observed during the breeding bird survey (see list in **Appendix 4**), all of which are listed in the Niagara Natural Areas Inventory (NAI) as common or very common. Starling and House Sparrow are non-native, and typical in the suburban setting. The remaining 11 species are native and typical of the suburban setting except Killdeer which would have been attracted to the openness of the site, and of the gravel parking lot pad in particular. Only one is provincially designated species at risk. But the four Barn Swallow seen foraging over the field are no longer Threatened, and since January 2023 are now designated Special Concern, for which the Endangered Species Act provides no protection. And, in any case, there is no nesting habitat for the Barn Swallow on the open site. No nesting activity was confirmed, but observations indicated that nesting on or near the small site is probable for seven of the observed species.

The breeding bird survey confirmed use of the site by common bird species that is not a constraint to the proposed watercourse realignment but that can inspire restoration landscaping to maintain and enhance bird habitat along the realigned channel.

Incidental Wildlife Observations

During each site visit, incidental wildlife observations were noted to contribute to SAR and SWH screening and to a fulsome understanding of the ecological functions at the site.

As early reconnaissance confirmed that there was no substantial amphibian breeding habitat, amphibian breeding surveys were not included in the scope and ToR. Myler observed no amphibians at the site.

Myler was on the lookout for incidental evidence of amphibians and reptiles during all visits, particularly as NPCA had expressed interest in the potential occurrence of turtles and turtle habitat, and sometimes snakes and snake hibernacula are associated with watercourses. But no turtles or snakes were observed, and the watercourses were found to lack habitat suitable for turtles and for snake hibernacula.

There were no notable incidental bird observations outside of the breeding bird survey observations.

Mammals and mammal sign observed at the site included direct observations of Eastern Gray Squirrel, Red Squirrel, Woodchuck, Eastern Cottontail, and observed tracks and droppings of White-tailed Deer.

No terrestrial crustaceans (burrowing crayfish) or their burrows were observed.

The mowed turfgrass and narrow treed and shrubby riparian strips were unremarkable in extent and habitat quality, including for insect SAR and SWH. The ephemeral flow and lack of aquatic habitat in the Tributary 1B segment was observed to be devoid of aquatic insect habitat. The intermittent flow and miniscule refuge pools within the Tributary 2A segment provides only very limited potential habitat for a few of the toughest aquatic insects and is neither substantial nor significant, particularly as the reach downstream of the site is artificial roadside ditch.

Incidental wildlife observations did not identify any species or ecological functions that could be a constraint to the proposed watercourse realignment, but similar to the breeding bird results the observations of common mammalian wildlife inspire restoration landscaping to maintain and enhance wildlife habitat along the realigned channel.

SAR Screening

The SAR screening combined consideration of existing provincial NHIC records of local SAR occurrences with Myler's on-site observations of plants, wildlife, and habitat features.

Review of NHIC species at risk (SAR) records in the vicinity if the site revealed the following species:

- Snapping Turtle (Special Concern) – no suitable aquatic habitat on site.
- Blanding's Turtle (Threatened) – no suitable aquatic habitat on site.
- Short-eared Owl (Special Concern) – extensive open foraging habitat is absent.
- Eastern Meadowlark (Threatened) – no suitable meadow habitat on site.
- Barn Swallow (formerly Threatened, recently reclassified Special Concern) – observed during the breeding bird survey, but no nesting habitat on site.
- American Chestnut (Endangered) – not observed/recorded among site plant species.
- Cucumber Tree (Endangered) – not observed/recorded among site plant species.

No designated SAR are among the plants and animals that were observed at the site during the botanical inventory, breeding bird survey and incidental observations.

The leaf-off survey of the treed riparian corridor and shrub thicket included the February and March 2022 site visits and found trees to be young and of tight-barked species in good condition and lacking cavities. As such, candidate maternity roost habitat of endangered bats was determined to be absent.

Accordingly, there are no SAR constraints to the proposed realignment.

SWH Screening

The SWH screening followed guidance provided in the provincial Significant Wildlife Habitat Criteria Schedules for Ecoregion 7E and, like the SAR screening, was based on the sum of observations of plants, wildlife, and habitat features at the site during all the site visits. Ecoregion 7E Criteria Schedules describe the various types of SWH that are defined for the ecoregion within which the site occurs. The types of SWH are organized into five categories:

- Seasonal Concentration Areas of Animals
- Rare Vegetation Communities or Specialized Habitat for Wildlife
- Habitat for Species of Conservation Concern (Not including Endangered or Threatened Species)

- Animal Movement Corridors
- Exceptions for Ecoregion 7E (Note: this category simply identifies Long Point, on Lake Erie, as Bat Migratory Stopover Area SWH and has no bearing on the site.)

None of the types of seasonal concentration areas and specialized habitat for wildlife, such as woodland amphibian breeding habitat, occur within or next to the site.

No rare vegetation community was observed at the site and adjacent lands.

Barn Swallow was the sole species of conservation concern that was observed, but its presence on the site was incidental, related only to general aerial foraging, and did not include nesting habitat.

The site is not situated between amphibian breeding pools/sloughs and broader amphibian summer habitat, so there is no animal movement corridor SWH associated with the site.

Accordingly, there are no SWH constraints to the proposed realignment.

Summary of Natural Heritage Constraints and Opportunities

Review of existing information combined with confirmatory and supplementary field observations revealed that:

- Tributary 1B is not direct fish habitat on the site and is limited to a simple flow conveyance function to downstream habitats.
- Only Tributary 2A is direct fish habitat, and even that is based only on incidental occurrence of fish swept downstream and not on the occurrence of sensitive or productive fish habitat at the site.
- The treed riparian corridor of Tributary 2A is too narrow to be designated Other Woodlands per the Niagara Region Official Plan.
- SAR and SWH are absent from the site and adjacent lands.

As noted above, neither watercourse possesses sensitive fish spawning or nursery habitats. Neither watercourse supports upstream fish migrations. Neither watercourse contains resident fish at or near the site. As such, neither watercourse presents complex issues of habitat form, feature, or function to be solved in the realignment design. The realignment design will simply need to preserve conveyance, avoid exacerbating flood conditions, and be able to temporarily host displaced fish within the eastern channel. Additionally, the realignment design acknowledges the occurrence of treed riparian corridor, however narrow, and includes proposed restorative landscaping to create and maintain a robust native-species riparian corridor along the realigned channel.

PROPOSED WATERCOURSE REALIGNMENT

The proposed realignment includes both watercourse segments at the site, Konkle Creek Tributaries 1B and 2A, on the realignment design prepared by Matrix Solutions, with hydraulic engineering contributed by S. Lewellyn Associates.

Prior to development of the proposed realignments, and consideration of alternatives to/for realignment of each of the watercourse segments separately, a universal "Do Nothing" option or alternative was considered whereby the existing segments would be retained in their current alignment and condition on the site. However, the "Do Nothing" option was determined not to be feasible in consideration of the existing instability and ongoing erosion of fill and soils along the Tributary 2A channel and the need to maintain the site and improve conditions of conveyance through the site presently and in anticipation of its anticipated future contribution to the Beamsville urban area. The existing alignment and condition of the watercourse segments is the purely artificial result of historical artificial realignment and channelization of local drainage, combined with fill placement, that served the historical fruit orchard land use. That drainage pattern and the configuration of the channels is no longer relevant in the urban setting and is unstable in the case of Tributary 2A. If the existing Tributary 2A channel was stable and functional, it could make sense to consider leaving it as it is. But as it will clearly require extensive rehabilitation to a desired long-term stable and functional configuration, it must also be considered that the current artificial alignment is not the best long-term alignment for conveyance, for conservation, or ultimately to achieve the efficient use land, and that an alternative alignment, while also artificial, could be much better. Additionally, the existing configuration does not possess any significant fisheries or natural heritage features or functions that would be lost or negatively affected by a well-designed realignment. Any physical or ecological function of the channels could be maintained and improved in a realigned configuration that would simultaneously halt the existing erosion, would simplify site maintenance in the short term, and would promote the efficient use of land and eventual urban intensification in the long term.

Realignment of 1B will be limited to minor adjustments to its existing channel in the western limit of the site. Tributary 1B will be maintained as a separate watercourse, distinct from Tributary 2A. Early consideration of alternatives included diversion of 1B's minor catchment and channel to 2A to create a single realigned channel, but the diversion would complicate and perhaps exacerbate flooding, particularly downstream of the site along Lincoln Avenue, and was therefore rejected. Early consideration of alternatives also included enclosure of 1B in a pipe within the western bank of a realigned 2A, but retention of an open, separate, and naturalized 1B channel as part of a wider combined realigned riparian corridor next to the realigned 2A channel was selected as a superior alternative in terms of simplicity, cost, conveyance and flood storage performance, and enhancement of natural heritage form and function at the site.

Realignment of 2A will see the existing north-south segment abandoned in favour of a new channel that is shifted westward within the site to lay adjacent to the slightly realigned 1B. The westward shift will be accomplished with an enclosure along King Street that will convey discharge from the existing King Street culvert westward to the head of the new channel. Alternatives that were considered included westward relocation of the Tributary 2A culvert crossing that was being considered as part of a Regional study of King Street improvements and westward diversion from the existing culvert location within an open channel adjacent to King Street. However, consideration of the culvert relocation was abandoned by the Regional study due to concerns with utility location, maintenance, and sequencing, and because the road widening and improvements were already at an

advanced stage of design. The alternative creation of an open realigned channel directly adjacent to King Street was abandoned due to public safety concerns. Enclosure of the segment adjacent to the road would be safer than a deep open channel. Additionally, the enclosure would have no negative effect on the total extent of fish habitat, and as there is no upstream fish passage at King Street it would not affect access to off-site fish habitat.

The new 2A channel segment design includes creation of 8 pools to accommodate the channel gradient and to substantially increase the occurrence and extent of refuge pools for fish that are incidentally swept downstream to the site. The pools will also be a source of water for birds and other wildlife between intermittent flow events. The new channel will include a "tie-in" segment within the Town's lands north of the site to connect to the existing east-west channel segment that is located within the Town's lands and leads to the 2A Tributary reach within the Lincoln Avenue roadside ditch (also on Town lands). Rehabilitation of the channel on the Town's lands will include removal of the many large concrete slabs that were placed to armour the artificial bend in the channel and restoration of stable, vegetated banks. The approximately 111 metre total length of the resulting 2A channel will be slightly longer than the existing 102 metre total channel length, such that there will be a net increase in the length and area of fish habitat on Tributary 2A.

S. Llewellyn Associates contributed flood analysis to the design so that the separate realigned channels would continue to convey event flows such that flooding will not be exacerbated downstream along Lincoln Avenue and to the west on rural lands behind the Lincoln Avenue residences.

Matrix Solutions specified a staged approach to construction whereby the new 2A channel segments and the enclosure are first constructed in isolation and then brought online with decommissioning of the existing 2A segment. Staging is not required for the 1B channel, as the adjustments to its configuration are minor and can be accomplished in the dry as flow in 1B is highly ephemeral and short-lived and of low magnitude.

Finally, a landscape planting plan has been prepared by Matrix Solutions with species selection and placement provided by Myler. The realigned channel corridor containing the 1B and 2A channels will be seeded with native grasses and wildflowers (OSC Rural Ontario Roadside Native Seed Mix) as a base into which 66 native trees of 8 species and 392 native shrubs of 10 species will be planted. The native seed, shrubs and trees were selected to be appropriate to the Beamsville area and to provide high wildlife value and ecological function in addition to being aesthetically appealing. A uniformly broad, approximately 19.5 metre width, natural riparian corridor will be created along the realigned channels, similar in average width to the existing riparian corridor, most of which is 14-18 metres wide. Existing canopy cover associated with Other Woodland at the site will be replaced as the planted trees grow and fill in. Approximately 2330 m^2 of planted, naturalized riparian corridor will replace a similar area of existing riparian vegetation that will be removed along Tributary 2A.

Excerpts of the Matrix Solutions design of the proposed realignment of Tributary 1B and Tributary 2A are provided in **Appendix 5**, including depiction of the minor adjustment of Tributary 1B, the Tributary 2A enclosure and new channel, and the riparian restoration landscape plan.

IMPACT ASSESSMENT AND RECOMMENDED MITIGATION MEASURES

The realignment of 1B does not involve direct fish habitat or treed riparian habitat and will not affect conveyance of flow in the watercourse. There is negligible scope for impact associated with Tributary 1B, and that is limited to erosion and sedimentation during construction. Staged construction that includes the 1B channel, including the use of erosion and sedimentation controls and stabilization of disturbed soils, will mitigate the potential impacts associated with Tributary 1B realignment.

The 2A realignment is more involved, with the above-noted periodic downstream fish passage and incidental occurrence of fish and with the existing treed riparian corridor to consider.

The downstream fish passage and incidental occurrence of fish will continue to be supported during staged construction while the existing channel is online but will then be shifted to the newly constructed channel and pools of the realigned 2A channel. Incidentally occurring fish will be sought and salvaged from any pools remaining within the abandoned 2A channel, to be released alive to pools in the adjacent new channel.

As upstream fish migration in 2A is not possible past the site and does not appear to extend from downstream areas to the site, the realignment does not negatively affect upstream fish passage. Additionally, it cannot improve upstream fish passage because it is the King Street culvert and the private enclosure on the vineyard south of King Street that prevent upstream passage. However, the new channel segment design is such that upstream fish passage is possible within it during periods of flow, similar to the existing channel but enhanced by the provision of a series of larger refuge pools.

As specified in the DFO Request for Review, timing of the connection of the new 2A channel and abandonment of the existing 2A channel segment will avoid the spring spawning timing window of 15 March – 15 July as a conservative measure to mitigate erosion and sedimentation impacts on water quality downstream of the site.

Portions of the treed riparian corridor along 2A will be maintained during construction where they do not conflict with staging and construction of the new channel segments and the enclosure. Tree, shrub, and other vegetation removal is recommended to be completed during the September – March period to avoid bird nesting season. Tree and vegetation removal during the April – August bird nesting season must be guided by a qualified biologist who would conduct a nest search and recommend avoidance, mitigation and monitoring for any active nests that are discovered. None of the riparian trees are bat maternal roost habitat.

There is no vegetated riparian corridor upstream of the site on the vineyard, so the riparian corridor on the site is, like upstream fish passage, essentially the “end of the line” of upstream terrestrial/riparian linkage. The realignment design includes measures to maintain and enhance the upstream extent of natural riparian habitat through creation of a riparian corridor using native trees, shrubs, grasses, and wildflowers as specified on the landscape plan. As such, there will be no permanent loss of riparian function or canopy cover, and the quality and function of the riparian habitat will be enhanced by the increased diversity of the carefully selected native species that are specified on the plan.

Implementation of the proposed realignment includes measures to mitigate erosion and sedimentation and to restore and enhance riparian habitat. Annual monitoring of channel stability and the successful establishment

of riparian vegetation is recommended for a period of up to 5 years, with annual technical memoranda provided to NPCA to confirm success and to describe solutions implemented to address identified shortcomings.

POLICY COMPLIANCE

Town of Lincoln By-law 2020-57 Site Alteration and Tree Removal

The proposed watercourse realignment is not a Planning Act application subject to the Town's Official Plan policies. But the Town of Lincoln does have By-law 2020-57 that governs site alteration by grading and fill application/removal and protects against tree removal in settlement areas. Review of the By-law confirms that it contains an exemption where Regulation applies pursuant to the Conservation Authorities Act Section 28, in this case the NPCA Permit for the proposed watercourse alteration permit. This exemption is intended to avoid unnecessary duplication of review and permitting.

As such, By-law 2020-57 does not apply and review, compliance, and approval proceed under the NPCA permit process.

Federal Fisheries Act

As noted above, when the realignment design was sufficiently advanced, Myler submitted a Request for Review to the federal Department of Fisheries and Oceans (DFO). DFO issued a Letter of Advice that concluded the watercourse realignment as proposed would not contravene the federal Fisheries Act through the death of fish by means other than fishing, HADD, or effects to listed aquatic SAR. The Request for Review and the DFO Letter of Advice are provided in **Appendix 2**.

As such, Fisheries Act and Species at Risk Act compliance is assured, simplifying the NPCA permit review and approval process.

NPCA Policies

The test in NPCA policy of a proposed watercourse alteration is described in section 9.2.3.2 Criteria for Assessing Watercourse Alterations in the 2022 NPCA Policy Documents, as follows:

a) The need for the *watercourse* alteration has been demonstrated to the satisfaction of the NPCA;
b) The *watercourse* has been evaluated under NPCA's Procedural Manual and the alteration would be supported;
c) The proposed works are in accordance with NPCA standards;
d) Any proposed channel realignment shall only be allowed such that any required riparian *buffer* will not cross any property lines;

e) The proposed *watercourse* alteration does not increase *flood plain* elevations, flood frequency, erosion rates or erosion frequency along either side of the *watercourse*, upstream and/or downstream of the proposed works;
f) The works will not adversely affect the *ecological* and *hydrologic function* of the *watercourse* and *riparian zone*;
g) Adequate erosion protection measures are utilized when required; and
h) Sediment control measures are incorporated during the construction phase to the satisfaction of the NPCA.

Each of the Criteria for Assessing Watercourse Alterations is addressed, below:

a) The watercourse alteration, realignment in this case, is required to transition the site from its rural/agricultural past to its current urban context. It proposes to replace the historical alterations that served agricultural needs with a well-designed realignment and restoration that will serve the current and future urban needs that the site must fulfil. The existing watercourses were historically channelized to convey drainage through/between orchards within minimal width and footprint. Historical fill placement on the property confined the watercourses to narrow channels. The Tributary 2A channel is unstable and is actively eroding its steep, artificially filled banks. The historical alignment of the watercourses, particularly the easterly Tributary 2A, splits the site in two, limiting access to the western portion which is not conducive to current maintenance of the site and would ultimately complicate and limit the efficient use of serviced urban lands on the site.
b) The NPCA Procedural Manual Appendix L Channel Modification Checklist and Submission Requirements 2022 includes a note in the Introduction section that "*NPCA recognizes Natural Channel Design (NCD) is an approach to watercourse restoration and realignment which attempts to reconstruct channels to emulate the natural physical form of the river or stream that would be appropriate for that location. The result should be a channel that is in balance with the natural process of erosion and deposition in the watercourse so that the ecological functions of the watercourse, which depend on these processes, can be maintained or restored."* The Matrix Solutions realignment design employed natural channel principles to realign and enhance the form and function of the two artificially altered watercourse segments at the site with stable, functional channels with hydrologic performance that will achieve the conveyance and flood criteria defined by S. Llewellyn Associates and that will maintain and enhance the ecological functions that were identified by Myler. Section 2.0 of the NPCA's Channel Modification Checklist lists 8 objectives (reproduced for reference, below), each of which has been fully achieved by the proposed plan (as noted in brackets after each objective):
    1. Preserve and enhance the physical and ecological function of the watercourse and natural system. (S. Llewellyn Associates and Matrix Solutions hydrologic and fluvial geomorphological contributions to the realignment design ensure preservation of watercourse physical function. The realignment design also addressed ecological function of the watercourses as determined by Myler and includes measures in natural channel design to substantially enhance the Tributary 1B riparian corridor and to restore an enhanced Tributary 2A channel and riparian corridor.)
    2. Ensure no adverse impacts on the watercourse upstream or downstream of the proposed alteration. (Realignment design was developed to accept conveyance from upstream, with no upstream impacts. There is no upstream ecological connection to consider for either

watercourse. The design further ensures no adverse impacts on downstream watercourse segments by maintaining the two, separate subwatersheds and employing channel design that maintains and enhances hydrologic performance and ecological function and linkage and prevents downstream impacts of excessive erosion and sedimentation.)

3. Ensure no increase in upstream and downstream flooding. (S. Llewellyn analysis as the basis of realignment design ensures no increase in upstream and downstream flooding.)
4. Ensure no decrease in riparian/floodplain storage. (S. Llewellyn analysis as the basis of realignment design ensures no decrease in flood storage.)
5. Preserve and/or restore natural vegetation such as trees and shrubs to the maximum possible extent. (Jackson Arboriculture Tree Inventory and Preservation Plan identifies tree preservation opportunities. Matrix Solutions landscape planting plan specifies native species restoration and enhancement of the realigned riparian corridor.)
6. Implement adequate erosion and sediment control (in-stream and off-stream) during and after construction. (Matrix Solutions construction staging plan identifies erosion and sediment control measures, including the fundamental isolation and staging of construction.)
7. Protect sensitive species during and after construction, including critical life processes. (EIS recommends fish salvage, avoidance of the spring spawning season in consideration of downstream fish habitat, and terrestrial vegetation removal to avoid bird nesting season and/or based on nest survey and biologist advice.)
8. Ensure no net loss of the productive capacity of the watercourse for fisheries. (DFO confirmed Fisheries Act compliance through their Letter of Advice, and acknowledged specifically that the realignment project would not cause death of fish or HADD.)

c) The combined application of engineering, fluvial geomorphology and ecology to the assessment of existing conditions and design of the proposed realignment is considered to meet NPCA standards.
d) The riparian buffer will be unchanged for Tributary 1B, which will remain in place with only minor adjustment, and will be maintained within the site for the north-south segment of Tributary 2A that will be shifted westward within the site. The “tie-in” to the existing east-west channel will be contained within the Town’s lands that contain the east-west channel.
e) S. Llewellyn Associates’ fundamental input to the realignment design ensures that existing conditions of flood plain elevations and flood frequency will not be increased. The Matrix Solutions natural channel design ensures that erosion rates and erosion frequency will not be increased.
f) The realignment has been designed to maintain and enhance aquatic and terrestrial ecological function of the watercourse and riparian zone through the natural channel design and the restoration landscape plan. The realignment design preserves and enhances the hydrologic function of the realigned channels, with substantial improvements to the Tributary 2A channel, in particular, by replacing the narrow, eroded, steep-sided ditch with a far superior realigned natural channel.
g) The Matrix Solutions realignment design specifies site-specific and appropriate staging and erosion protection measures.
h) The Matrix Solutions realignment design specifies sediment control measures that are anticipated to be acceptable to NPCA.

CONCLUSION AND RECOMMENDATIONS

This EIS has described existing fish habitat and natural heritage conditions of the subject regulated watercourses and has determined that the proposed watercourse realignment will have no negative impact on the watercourses and associated riparian natural heritage features or their ecological functions.

Screening for SWH and SAR has determined that both are absent from the site and neither will be impacted by the proposed watercourse realignment.

Design of the proposed realignment to maintain hydraulic performance (i.e., conveyance and flood limits) and employing natural channel design principles and creation of a native species riparian corridor will enhance watercourse physical and ecological functions.

Implementation of the proposed realignment includes measures to mitigate erosion and sedimentation and to restore and enhance riparian habitat. Annual monitoring of channel stability and the successful establishment of riparian vegetation is recommended for a period of up to 5 years, with annual technical memoranda provided to NPCA to confirm success and to describe solutions implemented to address identified shortcomings.

Accordingly, the proposed watercourse realignment conforms to applicable NPCA policies and is recommended for approval through issuance of a NPCA Permit.

APPENDIX 1:
EIS Scope / ToR

Myler Ecological Consulting

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14 October 2022

Taran Lennard, Watershed Planner
Niagara Peninsula Conservation Authority
250 Thorold Road West, 3rd Floor
Welland ON L3C 3W2

cc: Theresa Bukovics

RE: EIS Terms of Reference – 5205 King St., Beamsville Watercourse Realignment.

Introduction

Urbanlink Developments (Beamsville) Limited (Urbanlink) has retained Myler Ecological Consulting (Myler) to prepare an Environmental Impact Study (EIS) in support of proposed realignment of the two watercourse segments that cross the property at 5205 King Street, Beamsville, Ontario (the Site) (see Figure 1 map, below). This EIS Terms of Reference (ToR) has been prepared to describe the approach and content of the required supporting EIS.

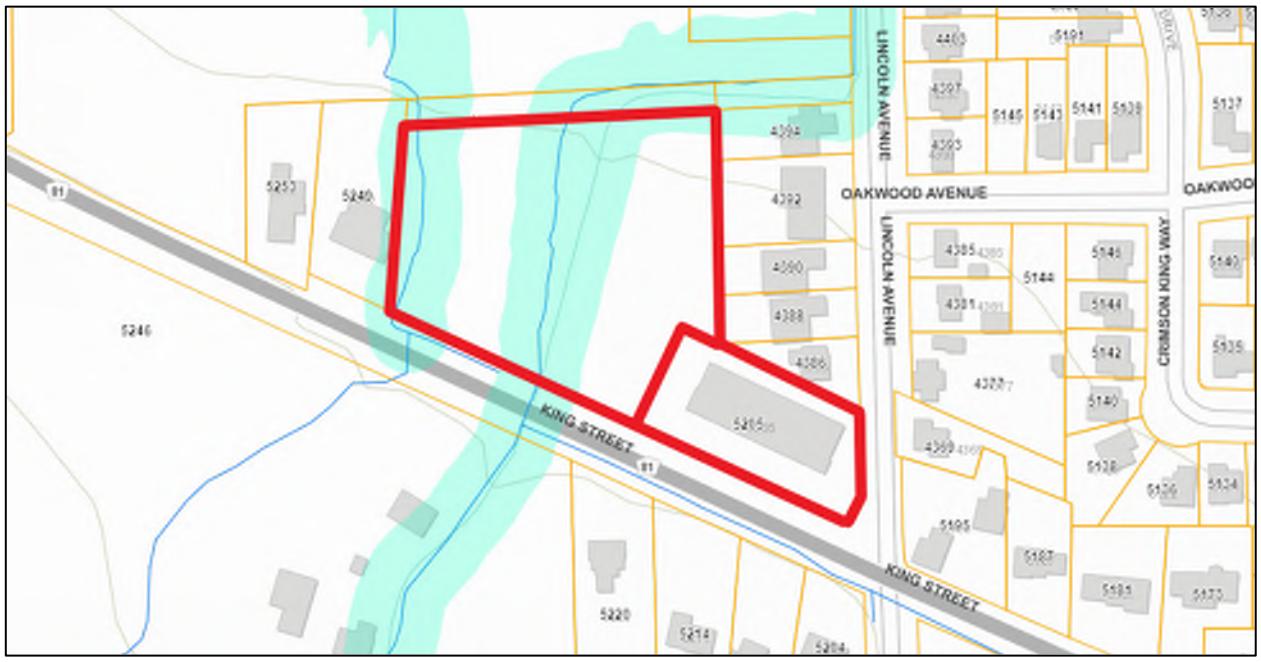


Figure 1: Location of the site and extent of watercourse segments and NPCA regulation lands.

The property is currently mostly manicured grass and gravel parking lot on historically placed and levelled fill. It is crossed from south to north by two historically realigned and channelized watercourses within the upper, headwaters reaches of the Konkle Creek subwatershed that are regulated by the Niagara Peninsula Conservation Authority (NPCA). The western watercourse occupies a shallow swale/ditch of mostly

manicured turfgrass. The eastern watercourse occupies a narrow channel incised within and/or flanked by fill and has a small riparian corridor of trees and shrubs. The Town of Lincoln Official Plan Schedule A2 shows "Natural Environment" mapped along each of the watercourse segments.

Policy Context

NPCA policy 9.2.3 *Watercourse Alterations* is relevant to the proposed watercourse realignment (9.2.3.1a) and includes 9.2.3.2 *Criteria for Assessing Watercourse Alterations* which will be addressed in the realignment design and in the EIS and other supporting studies as appropriate.

Background Review

Existing information and mapping of the designated natural features was sought in Town of Lincoln and Regional Municipality of Niagara Official Plans and Schedules. Department of Fisheries and Oceans (DFO) online Aquatic Species at Risk (SAR) mapping was used to screen for aquatic SAR in the Konkle Creek system and the watercourse segments at the site. Natural Heritage Information Centre (NHIC) online natural heritage mapping was used to screen for significant natural features and for recorded SAR occurrences in the vicinity of the site.

The Natural Heritage Summary Report for the Road and Drainage Improvements on Regional Road 81 (King Street) Between Greenlane and Lincoln Avenue (Colville Consulting Inc., February 2019) was reviewed for natural heritage information relevant to the site.

NPCA online Watershed Explorer mapping (see Figure 2, below) was accessed by the project engineer to confirm the extent of floodplain at and near the site.



Figure 2: Excerpt of NPCA Watershed Explorer mapping showing the watercourse segments and associated regulation floodplain (dark blue) and regulation lands (lighter blue-green) at the site over 2020 aerial imagery.

Biophysical Inventory

The EIS study area is focused within the site where the watercourse realignments are proposed and where the Town of Lincoln has mapped Natural Environment (see Figure 2, above). Upstream and downstream reaches of the watercourses are included in the study area to the extent that they and their characteristics relate to fish habitat, fish passage and the extent of riparian habitat.

Study approach and methods for each of the inventories and delineations identified in Part 2 of the ToR Checklist (attached) is summarized as follows:

- **SAR:** Screening of aquatic and terrestrial SAR based on DFO and NHIC mapping, respectively, plus on-site observations of habitat and plant/wildlife species.
- **Significant Wildlife Habitat (SWH):** Screening of site habitat features against SWH listed in the Ecoregion 7E SWH Criteria Schedules plus on-site observations of habitat and plant/wildlife species.
- **Ecological Land Classification:** Mapping based on aerial imagery and on-site observations of vegetation to discriminate manicured, cultural and natural cover on the site.
- **Botanical Inventory:** A single season survey would suffice for the simple riparian vegetation community, but vegetation has been observed during all four seasons concurrent with other observations at the site. Contributes to screening of SAR and SWH.
- **Avifauna:** Breeding bird survey conducted using Ontario Breeding Bird Atlas methods, plus incidental bird observations, to characterize ecological function of riparian corridor and contribute to screening of SAR and SWH.
- **Herpetofauna:** Habitat observations to screen for presence/absence of suitable amphibian, turtle and snake habitats. Contributes to SAR and SWH screening. Incidental wildlife observations include amphibians and reptiles if encountered.
- **Mammals:** Habitat observations to screen for presence/absence of suitable mammalian wildlife habitats, including the potential occurrence of bat maternity colony habitat as part of SAR and SWH screening. Incidental observations of observed mammals.
- **Terrestrial Crustaceans:** Habitat observations include checking for the occurrence of crayfish chimneys.
- **Insects:** Habitat observations contribute to SAR and SWH screening relevant to insect SAR and SWH and generally to determine presence/absence and character of aquatic insect habitat.
- **Aquatic:** Multi-season (i.e., winter, spring, summer and fall in this case) observations generally per the descriptive habitat elements of the Ontario Stream Assessment Protocol to describe existing aquatic habitat, its features (e.g., channel form, substrates, in-stream cover, and flow characteristics) and functions (e.g., fish presence/absence and species, general/specialized habitats, access/migration barriers).
- **Delineation of Features:** Existing watercourses are depicted on the site topographical survey. Staking of the watercourse limits (i.e., limit of fish habitat) is not applicable as the existing channelized reaches of the two watercourses will be abandoned and a new design and ultimate limit of floodplain and watercourse channel features will be based on engineering and fluvial geomorphological analysis.

Biophysical Analysis

The general approach to the Checklist's list of Biophysical Analysis considerations is described as follows:

- **SAR:** The site is small, mostly manicured, adjacent to busy King Street, and surrounded by commercial and residential properties. Watercourses at the site are intermittent, channelized and lacking in natural channel characteristics. Riparian vegetation is young, of low diversity, and of limited extent. Aquatic SAR

and SAR habitat is absent on DFO online mapping. None of the SAR listed within NHIC 1km squares at/near the site would occur on or within the site's limited natural habitat features. The potential occurrence of SAR is very low, but the watercourses were checked for potential turtle habitat and trees in the riparian corridor were checked for the occurrence of Butternut and for potential as bat maternity roost/colony, none of which were observed.

- **SWH:** Similar to the observations conducted to screen for SAR, observations of the site setting and its very limited habitat characteristics did not indicate the presence of candidate SWH.
- **Regulated Features:** The watercourse regulated features, and their regulated floodplains, will be evaluated to address compliance with the Fisheries Act and NPCA Regulation.
- **Enhancement Area(s):** The proposed watercourse realignments have from the beginning been conceived by the proponent and their consultants as an opportunity to enhance the aquatic and riparian features and functions at the site.
- **Natural Hazard:** Floodplain is the sole natural hazard and is being addressed in design of the realignment by the project engineer, with input from the project fluvial geomorphologist.
- **Buffer Recommendations:** A buffer width and composition will be recommended upon completion of the evaluation and design of the proposed watercourse realignments.

Alternative Assessment

Realignment of the eastern watercourse was identified as the preferred alternative to management of the watercourses on the site to achieve *efficient use of land* within the existing urban boundary without compromising natural heritage features and their ecological functions.

Watercourse enclosure, of the western watercourse segment in particular, was initially considered as an alternative but was abandoned in favour of maintaining open channels.

Westward realignment of the larger eastern watercourse was selected in preference to eastern realignment to avoid conflict with the existing commercial plaza at the site, to realize the greater functional and ecological benefits of a single, wider, and longer naturalized watercourse corridor at the western limit of the site, and to facilitate tie-in with the downstream reach within the Town lands.

Impact Assessment

The scope of the EIS impact assessment will include consideration of direct on-site and indirect off-site (i.e., upstream and downstream) impacts, including cumulative impacts. Impacts are expected to be *positive*, with the realigned channels designed to possess features and functions superior to the existing channels.

Mitigation

Mitigation discussion within the EIS will include specific recommendations for physical measures, activities and seasonal avoidance strategies to mitigate harm to aquatic and terrestrial wildlife during site preparation and construction. Enhancement and restoration are among the principal elements of the realignment approach and design.

Monitoring Program

A monitoring program is anticipated to include monitoring of erosion and sedimentation controls during construction and post-construction monitoring of channel stability and successful establishment of riparian vegetation. It will be developed in consultation with and/or on the recommendations of the project engineer and fluvial geomorphologist.

Recommendation and Conclusions

The EIS is concerned with compliance with NPCA watercourse policies and Regulation of the subject watercourses, and their realignment in compliance "interference with" tests relevant to watercourses and will therefore include corresponding recommendations and conclusions.

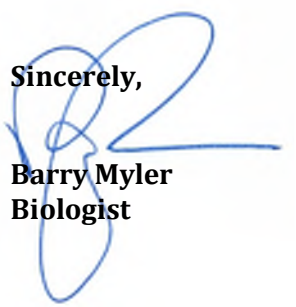
Additionally, as the EIS is also concerned with the Town's Natural Environment designation and generally with the ecological features and functions of the watercourses, recommendations and conclusions relating to "no negative impact" will also be included.

Maps and Figures

Maps and Figures are expected to include depiction of site location, extent of NPCA regulated features, excerpts of Official Plan schedules, aerial imagery, ELC, locations of notable observations, and ultimately the proposed realignment design and riparian restoration plan.

Field Notes / Data Sheets

Field notes / data, including relevant soil data, will be included within the EIS or will be cited in the EIS as it relates to the work of others (e.g., geotechnical, engineering and fluvial geomorphological reports).



Sincerely,

Barry Myler
Biologist

Appendix D: EIS Scoping and Terms of Reference Checklist

The **Scoping Checklist** provides a brief summary of components to be considered in the preparation of an EIS Terms of Reference. Scoping is to be completed in consideration of the following:

- Scope and scale of the proposed *development* or *site alteration*;
- Scope and scale of potential impacts resulting from the proposed *development* or *site alteration*;
- Sensitivity or complexity of the features on or adjacent to the proposed project to proposed development and site alteration, and specific impacts associated with the proposed project;
- Surrounding land use context (e.g., existing *development*);

Depending on the items above, not all elements listed below will necessarily be required. Large projects, those with a higher risk of potential impact, and those with complex natural heritage featuresand functions will generally require a more comprehensive set of assessments, analyses, etc. Smaller scale projects with lower potential impacts and where natural heritage features and functions are less complex are suitable for a scoped EIS and a greater number of items may be 'scoped out' (i.e., not required). In all cases, some items listed below may not be required depending on the specific site conditions and project.

Part 1 – Project Information

1-A | General Information

Project Name: 5205 King St Beamsville - Watercourse Realignment

Applicant: Urbanlink Developments (Beamsville) Ltd

Primary Contact: Andrew Bear

Contact Information: 905-906-1982 andrew.bear@urbanlink.ca

Project Location: (Street Address or Lot and Concession): 5205 King St Beamsville ON

Consultant: Myler Ecological Consulting

Consultant Lead Contact Information: Barry Myler 289-700-3038 bmyler@cogeco.ca

NPCA File Number:

Other Agency File Number (if applicable):

1-B | Project Type

- ☐ Accessory Structures (e.g. in ground pools, decks, docks, gazebos)
- ☐ Buildings: New Construction, reconstruction, redevelopment, additions (less than 1000 square feet)
- ☐ Buildings: New Construction, reconstruction, redevelopment, additions (greater than or equal to 1000 square feet)
- ☐ Building: Addition to existing dwelling
- ☐ Septic System or other service
- ☐ Other development or site alteration
- ☐ Subdivision
- ☐ Commercial/Industrial
- ☐ Lot Severance for single detached dwelling on an existing lot
- ☑ Other: realignment of channelized watercourses

Part 2 – Scoping of Inventories and Delineations

This section provides general guidance on what types of field inventories and feature delineations are anticipated to be required for the EIS. The applicant (or consultant) is to provide detailed description(s) of the proposed approach (survey type, specific methods, seasons, etc.), rationale and locations for surveys as part of a Draft Terms of Reference.

This section includes scoping of the project area and if applicable, the adjacent lands.

☑	**Species at Risk** ☐ Screening Assessment[1] ☐ Targeted surveys are anticipated to be required. To be confirmed through Screening Assessment and/or in consultation with MECP, as appropriate ☑ **All of the above**
☑	**Significant Wildlife Habitat**

[1] The Terms of Reference (TOR) is to include a preliminary Species at Risk (SAR) screening assessment to identify if anySAR have potential to occur within or adjacent to the study area within a distance appropriate to determine impacts to the species or influence of species presence on the proposed *development* or *site alteration*. This may include species listed Provincially (ESA 2007) or federally (SARA 2004), as applicable to the species type and project.

	☐ Screening Assessment[2] ☐ Field program to address assessment of Significant Wildlife Habitat, as appropriate ☑ **All of the above**
☑	**Terrestrial** ☑ Ecological Land Classification (ELC)[3] ☑ Botanical Inventory ☑ Avifauna (Birds) ☑ In-field Habitat Assessment ☑ Incidental/ General Observations[4] ☑ Detailed or Targeted Survey(s) ☑ Herpetofauna (Amphibians and Reptiles) ☑ In-field Habitat Assessment ☑ Incidental/ General Observations[5] ☐ Detailed or Targeted Survey(s) ☑ Mammals ☑ In-field Habitat Assessment ☑ Incidental/ General Observations ☐ Detailed or Targeted Survey(s) ☑ Terrestrial Crustaceans (e.g., chimney crawfish) ☑ In-field Habitat Assessment ☐ Incidental/ General Observations ☐ Detailed or Targeted Survey(s)

[2] A Screening Assessment for *Significant Wildlife Habitat* (SWH) includes a desktop and secondary-source level assessmentof habitats present against criteria for SWH in the applicable Ecoregion Criteria Schedule for the Project. This assessment approach is suitable for identifying most candidate habitat areas (e.g., by vegetation community); for most SWH types this approach is not enough to confirm presence or absence. Where candidate areas may be impacted, additional field surveys toconfirm will be required.

[3] Ecological Land Classification codes should follow the ELC Second Approximation (Lee 2008). Each ELC polygon requires representative soil sample(s).

[4] This survey approach should be limited to only those projects with low risk of impact to this species group and where the potential presence of Species at Risk or *Significant Wildlife Habitat* is very low.

[5] This survey approach should be limited to only those projects with low risk of impact to this species group and where the potential presence of Species at Risk or *Significant Wildlife Habitat* is very low.

☑	☑ Insects ☑ In-field Habitat Assessment ☑ Incidental/ General Observations ☐ Detailed or Targeted Survey(s) **Aquatic** ☑ In-field Habitat Assessment/ General Assessment ☑ Incidental/ General Observations ☑ Detailed or Targeted Survey(s)
☑	**Delineation of Features**[6] ☐ Wetland[7]* ☐ Riverine Flood Hazard/ Erosion Hazard ☐ Floodplain ☐ Hazard Land ☐ Watercourse ☐ Shoreline Flood and Erosion Hazard *At this time, the NPCA is requesting consultants to pre-stake the feature prior to NPCA conducting a site visit. **NOTES:** Existing watercourses are depicted on the site topographical survey. Staking of the watercourse limits (i.e., limit of fish habitat) is n/a as the existing channelized reaches of the two watercourses will be abandoned and a new design and ultimate limit of floodplain and watercourse channel features will be based on engineering and fluvial geomorphological analysis.

[6] Where Species at Risk are found to occur, delineation of habitat will also be required, but cannot be known at the scoping stage. Delineation of habitat is to be done in consultation with, or be approved by the MECP, as appropriate.

[7] Any changes to provincially evaluated wetlands must be reviewed and approved by the NDMNRF prior to inclusion within the EIS and correspondence from the NDMNRF appended to the EIS.

Part 3- Other Studies[8]

☑	**Geotechnical** ☐ Secondary Source ☑ Study Required
☐	**Hydrogeological** ☐ Secondary Source ☐ Study Required
☑	**Geomorphological** ☐ Secondary Source ☑ Study Required
☑	**Surface Water (e.g. hydrologic review, fluvial geomorphology)** ☐ Secondary Source ☑ Study Required
☑	**Natural Hazard(s)** ☐ Secondary Source ☑ Study Required
☐	**Wetland Water Balance (Risk Evaluation)**[9]
☐	**Other (Specify)**_____

[8] These studies are generally prepared as stand-alone reports. Relevant information on the interaction of these processes and functions with natural heritage features and functions is to be addressed in the EIS. It is strongly encouraged that the programs for these studies be integrated with the EIS Terms of Reference to ensure information appropriate to information the EIS is collected. This includes slopes, valleylands, dunes, karst formations etc.

[9] This study will determine the need for further wetland hydrologic monitoring.

Part 4- Terms of Reference Requirements

☑ **Introduction**

- ☑ Description of Subject Property
- ☑ Description
- ☐ Of proposed development or site alteration
- ☑ Description of known site history pertinent to the EIS (e.g., former land use(s), grading, filling)
- ☑ Description of landscape context
- ☑ **Map:** location of subject property, orthophotography base.

☑ **Policy Context**

- ☑ Legislative, regulatory and policies applicable to the property and the proposed development or site alteration
- ☐ Current land use designation and zoning
- ☐ Proposed land use designation and zoning to support proposed development if a *Planning Act* application is also required.

☑ **Background Review**

- ☑ List relevant natural heritage and hazard information secondary sources (e.g., species atlases, databases);
- ☑ List relevant existing studies, plans etc. (if/ as available)
- ☑ **Map:** location of subject property, orthophotography base.

☑ **Biophysical Inventory**

- ☑ Define and provide rational for study area
- ☑ Detailed study approach and methods for all identified inventories and delineations identified in **Part 2.** Where there is rationale to exclude a specific feature or area
- ☐ From assessment, provide rationale for consideration. Appropriate justification /rationale for single-season or multi-season surveys shall be provided (e.g.,vegetation community / ELC, wetland delineation, etc.)
- ☑ Map: location of proposed surveys, subject property, proposed study area, orthophotography base.

☑ **Biophysical Analysis**

Describe the general approach and anticipated approach and/or method(s) of analyses for the following:

- ☑ Species at Risk: Preliminary screening assessment to be provided as part of the TOR. This will inform the field program staff.
- ☑ Significant Wildlife Habitat: Preliminary screening assessment to be provided as part of the TOR. This will inform the field program staff.
- ☑ Evaluation of regulated features and/or areas within the study area against appropriate policies and guidelines.[10]
- ☑ Enhancement Area(s)
- ☑ Natural Hazard within the study area
- ☑ Buffer recommendations

☑ **Alternative Assessment**

Outline approach to identifying or assessing alternatives to avoid or minimize impacts.

☑ **Impact Assessment**

Confirm scope includes an impact assessment that will consider direct, indirect and cumulative impacts and provide general approach to impact assessment.

☑ **Mitigation**

Confirm scope includes identification of mitigation measures that effectively address anticipated impacts resulting from the proposed development or site alteration. Mitigation isto include recommendations for enhancement or restoration.

☑ **Monitoring Program**

If a monitoring program may be required, confirm that consideration and recommendationsfor a monitoring plan (or rationale that one is not required) will be included in the EIS.

☑ **Recommendations and Conclusions**

Confirm that recommendations and conclusions with respect to the 'no negative impact' or 'interference with' tests be included in the EIS.

[10] This may include provincial, federal legislation, policies, plans and guidance documents, asappropriate and applicable to the study area, project type, species and features.

☑ **Maps and Figures**

Outline anticipated maps and figures to be prepared for and included in the EIS todocument and support assessment(s), recommendations, and conclusions.

☑ **Field Notes / Data Sheets**

Field notes / data sheets are required to be appended to the completed EIS. Please ensure that soil data is included with the appended data.

Note: Maps / figures may be combined for ease of production and review. The maps / figures listed areprovided to illustrate the information that is to be included as part of the TOR submission.

CHECKLIST COMPLETION RECORD

A record of the individuals who complete the checklist is provided below.

COMPLETED BY:	
Name: Barry Myler	Name:
Position: Consulting Biologist	Position:
Agency: Myler Ecological Consulting	Agency:
Contact Information: bmyler@cogeco.ca 289-700-3038	Contact Information:
Date: 10/11/22	Date:

APPENDIX 2:

DFO Request for Review and Letter of Advice

Request for Review

Please note that Guidance on Submitting a Request for Review is available at the end of this form. This guidance explains the requirements for a Request for Review by DFO under the fish and fish habitat protection provisions of the *Fisheries Act*. All information requested must be provided. If you attach documents to your application with additional information, you must still provide appropriate summaries in the spaces provided on the application document or your application will be considered incomplete.

A) Contact information

Name of Business/Company:

Urbanlink Developments (Beamsville) Ltd

Name of Proponent:

Andrew Bear

Mailing address:

5205 King St., Suite 5

City/Town:

Beamsville

Province/Territory:

Ontario

Postal Code:

L3J 1P6

Tel. No. :

905-906-1982

Fax No.:

Email:

andrew.bear@urbanlink.ca

Select additional contact:
Contractor/Agency/Consultant *(if applicable):*

Barry Myler
Myler Ecological Consulting

Mailing address:

7 Olive Crescent

City/Town:

Stoney Creek

Province/Territory:

Ontario

Postal Code:

L8G 2T2

Tel. No. :

289-700-3038

Fax No.:

Email:

bmyler@cogeco.ca

Is the Proponent the main/primary contact? ○ Yes ◉ No

**All definitions are provided in Section G of the Guidance on Submitting a Request for Review*

If no, please enter information for the primary contact or any additional contact.

Barry Myler, Myler Ecological Consulting 289-700-3038 bmyler@cogeco.ca

B) Description of Project

If your project has a title, please provide it.

5205 King St Beamsville - Watercourse Realignment

Is the project in response to an emergency circumstance*? ○ Yes ◉ No

Does your project involve work in water? ◉ Yes ○ No

If yes, is the work below the High Water Mark*? ◉ Yes ○ No

What are you planning to do? Briefly describe all project components you are proposing in or near water.

Realignment of a historically channelized watercourse. Ditch-like existing segment will be replaced by a channel designed to meet engineering requirements of flood conveyance and storage, and according to natural channel design principles. The channel and riparian corridor will be naturalized through seeding and planting of native trees, shrubs and herbaceous vegetation.

How are you planning to do it? Briefly describe the construction materials, methods and equipment that you plan to use.

New channel will be excavated in existing soils in the dry, separate from the existing flowing channel. Channel cross-section dimensions and design gradient and substrates have been specified by the project engineer and fluvial geomorphologist to create a stable channel segment. The excavated channel will stabilized through application of stone, erosion blanket or similar where required, and application of seed and shrub plantings. The new channel segment will be connected to downstream and upstream once it has been determined to be stable and in a condition suitable to convey flow (i.e., erosion controls in place, seed germinated and stabilizing soil surface). Note that the upstream portion of the realignment includes a piped enclosure extension from the existing upstream King Street culvert, essentially a culvert extension, to achieve the westward realignment in a manner that preserves public safety but that does not compromise upstream fish passage because upstream fish passage at the King Street culvert is not possible.

Include a site plan (figure/drawing) showing all project components in and near water.

Are details attached? ◉ Yes ○ No

Identify which work categories apply to your project.

- ☐ Aquaculture Operations
- ☐ Aquatic Vegetation Removal
- ☐ Beaches
- ☐ Berms
- ☐ Blasting / Explosives
- ☐ Boat Houses
- ☐ Boat Launches / Ramps
- ☐ Breakwaters
- ☐ Bridges
- ☐ Cable Crossings
- ☐ Causeways
- ☐ Culverts
- ☐ Dams
- ☐ Log Handling / Dumps
- ☐ Log Removal
- ☐ Moorings
- ☐ Open Water Disposal
- ☐ Piers
- ☐ Riparian Vegetation Removal
- ☐ Seismic Work
- ☐ Shoreline Protection
- ☐ Stormwater Management Facilities
- ☐ Surface Water Taking
- ☐ Tailings Impoundment Areas
- ☐ Temporary Structures
- ☐ Turbines

All definitions are provided in Section G of the Guidance on Submitting a Request for Review

- [ ] Dewatering / Pumping
- [ ] Docks
- [ ] Dredging / Excavation
- [ ] Dykes
- [ ] Fishways / Ladders
- [ ] Flow Modification (hydro)
- [ ] Groundwater Extraction
- [ ] Groynes
- [ ] Habitat Restoration
- [ ] Ice Bridges
- [ ] Water Control Structures
- [ ] Water Intakes / Fish Screens
- [ ] Water Outfalls
- [x] Watercourse Realignment
- [ ] Weirs
- [ ] Wharves
- [ ] Wind Power Structures
- [ ] Other Please Specify

Was your project submitted for review to another federal or provincial department or agency? ○ Yes ◉ No

If yes, indicate to whom and associated file number(s).

C) Location of the Project

Coordinates of the proposed project Latitude N Longitude W

OR UTM zone 17T ; 4780791 Easting

622854 Northing

Include a map clearly indicating the location of the project as well as surrounding features.

Name of Nearest Community (City, Town, Village): Beamsville

Municipality, District, Township, County, Province: Town of Lincoln, Niagara Region, Ontario

Name of watershed (if applicable): Konkle Creek (Lake Ontario)

Name of watercourse(s) or waterbody(ies) near the proposed project: Tributary of Konkle Creek

Provide detailed directions to access the project site:

Site is at 5205 King Street, Beamsville, north of King Street, accessible by existing driveway / parking area.

D) Description of the Aquatic Environment

Identify the predominant type of aquatic habitat where the project will take place.

- ○ Estuary (Estuarine)
- ○ Lake (Lacustrine)
- ○ On the bank/shore at the interface between land and water (Riparian)

**All definitions are provided in Section G of the Guidance on Submitting a Request for Review*

- (•) River or stream (Riverine)
- ( ) Salt water (Marine)
- ( ) Wetlands (Palustrine)

Provide a detailed description of biological and physical characteristics of the proposed project site. This description should include information on aquatic species at risk* (https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html), their residence* and critical habitat* if found in the area. An overview of the distribution of aquatic species at risk and the presence of their critical habitat within Canadian waters can be found here http://dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html

There are no mapped aquatic species at risk.

The watercourse has an intermittent flow regime.

Only two fish, both juvenile Creek Chub, have been observed on-site in the watercourse during observations conducted over the past 8 months. Several juvenile Creek Chub have been observed further downstream. Observations of upstream and downstream off-site portions of the watercourse support a conclusion of intermittent downstream "migration" or flushing of Creek Chub from upstream habitat near the Niagara Escarpment rather than upstream migration of these fish.

The watercourse is a channelized ditch-like feature flanked by historically placed fill in a formerly agricultural setting. It is down-cut, with steep eroded banks and a narrow riparian corridor of young trees, a mix of native and exotic shrubs, and weedy herbaceous vegetation.

Off-site portions of the watercourse upstream of the site are narrow, channelized, ditch-like features within existing vineyards. Fish passage upstream of King Street is not possible.

Off-site downstream portions include a short reach of channelized ditch conveying flow eastward, after which the watercourse occurs as the western roadside ditch of Lincoln Avenue in front of numerous residences and passing through numerous driveway culverts. Flow in the roadside ditch is also intermittent. No permanent refuge pools occur in the roadside ditch.

Include representative photos of affected area (including upstream and downstream area) and clearly identify the location of the project.

E) Potential Effects of the Proposed Project

Have you reviewed the Pathways of Effects (PoE) diagrams (http://www.dfo-mpo.gc.ca/pnw-ppe/pathways-sequences/index-eng.html) that describe the type of cause-effect relationships that apply to your project?

(•) Yes ( ) No

If yes, select the PoEs that apply to your project.

- [ ] Addition or removal of aquatic vegetation
- [ ] Change in timing, duration and frequency of flow
- [ ] Cleaning or maintenance of bridges or other structures
- [ ] Dredging
- [x] Excavation
- [ ] Fish passage issues
- [x] Grading
- [ ] Marine seismic surveys
- [ ] Organic debris management
- [ ] Placement of marine finfish aquaculture site
- [ ] Placement of material or structures in water
- [ ] Riparian Planting
- [ ] Streamside livestock grazing
- [ ] Structure removal
- [ ] Use of explosives
- [x] Use of industrial equipment
- [ ] Vegetation Clearing
- [ ] Wastewater management
- [ ] Water extraction

Will there be changes (i.e., alteration) in the fish habitat*? (•) Yes ( ) No ( ) Unknown

If yes, provide a description.

Ditch-like existing channel segment will be replaced by a longer channel segment designed according to natural channel principles, including refuge pools, and enhanced/buffered with native species tree, shrub and herbaceous planting/seeding. Fish migration/passage will not be

All definitions are provided in Section G of the Guidance on Submitting a Request for Review

affected.

Is there likely to be a harmful alteration, disruption or destruction of habitat used by fish? (•) Yes ( ) No ( ) Unknown

Is there likely to be destruction or loss of habitat used by fish? (•) Yes ( ) No ( ) Unknown

What is the footprint (area in square meters) of your project that will take place below the high water mark*?

Approximately 200 sq. metres (i.e., ~2m x ~100m of channel). This area will be more than offset by the new channel segment.

Is your project likely to change water flows or water levels? ( ) Yes (•) No ( ) Unknown

If your project includes withdrawing water, provide source, volume, rate and duration.

If your project includes a water control structure, provide the % of flow reduction.

If your project includes discharge of water, provide source, volume and rate.

Will your project cause death of fish? ( ) Yes (•) No ( ) Unknown

If yes, how many fish will be killed (for multi-year project, provide average)? What species and lifestages?

Connection of the realigned channel segment and abandonment of the existing channel segment will be timed to occur when the existing segment has neither flow nor standing water. If isolated pools remain, fish salvage will prevent the death of incidentally occurring Creek Chub in those refuge pools.

What is the time frame of your project?

The construction will start on MM/DD/YYYY and end by MM/DD/YYYY

If applicable, the operation will start on MM/DD/YYYY and end by MM/DD/YYYY

If applicable, provide schedule for the maintenance

If applicable, provide schedule for decommissioning

Are there additional effects to fish and fish habitat that will occur outside of the time periods identified above? ( ) Yes ( ) No

(If yes, provide details)

Can you follow appropriate Timing Windows (http://www.dfo-mpo.gc.ca/pnw-ppe/timing-periodes/index-eng.html) for all your project activities below the High Water Mark*? (•) Yes ( ) No

(If no, provide explanations.)

Have you considered and incorporated all options for redesigning and relocating your project to avoid negative effects to fish and fish habitat?

(•) Yes ( ) No

All definitions are provided in Section G of the Guidance on Submitting a Request for Review

If yes, describe.

The historically artificially channelized watercourse cuts through the centre of the property, leaving only very small developable parcels to the east and west of the channel. Maintaining the channel in that location prevents the efficient contribution of the property to intensification of development on serviced lands within the existing settlement area boundary. The realignment facilitates efficient development and will increase the length of open channel, area of fish habitat, and quality of fish habitat.

Have you consulted DFO's Fish and Fish Habitat Protection Measures Habitat (https://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures-eng.html) to determine which measures apply to your project? (●) Yes ( ) No

Will you be incorporating applicable measures into your project? (●) Yes ( ) No

If yes, identify which ones. If No, identify which ones and provide reasons.

Prevent the death of fish: Timing Window (spring spawning) and choosing a period of no flow in the intermittent watercourse for connection of the realigned segment and abandonment of the old segment. Fish salvage if any small pools remain in the old segment.
Maintain riparian vegetation: The existing riparian vegetation will be retained during construction of the new segment as a buffer zone.
Carry out works, undertakings and activities on land: The new channel will be constructed "on land", in the dry, isolated from the existing channel while the existing channel remains active.
Maintain fish passage: The existing channel will remain active during isolated construction of the new segment. Connection of the new channel and abandonment of the existing channel will be completed during a period of no flow. As such, fish passage will be unaffected.
Ensure proper sediment control: The new channel will be constructed in isolation and in the dry, with a vegetated buffer between it and the existing channel. The new channel will be stabilized against erosion with stone, erosion blanket, and/or vegetation before it is connected.
Prevent entry of deleterious substances in water: Machinery will be parked, refueled, and serviced away from the watercourse. Machinery will be continuously monitored for leaks and any leaks will be repaired immediately upon detection. Spill clean-up materials will be maintained on site in case of a fuel/lubricant/coolant leak from equipment.

Have you considered whether DFO standards and codes of practice apply to your project? ( ) No (●) Yes

If Yes, include a list.

None of the Codes of Practice are applicable to the project.

Have you considered other avoidance and mitigation measures? ( ) No (●) Yes

If Yes, include a list.

Avoidance and mitigation measures are described above. Key measures are construction and stabilization of the realigned segment in isolation, in the dry, before connection, and connection of the new segment during a period of no flow.

Are there any relevant measures that you are unable to incorporate? ( ) Yes (●) No

(If yes, identify which ones.)

What harmful effects to fish and fish habitat do you foresee after taking into account the avoidance and mitigation measures described above?

No harmful effects, only positive effects are foreseen. No fish are anticipated to be killed. Fish habitat in the new channel segment has been designed to be of higher quality and function and of greater length and area than existing habitat in the segment that will be abandoned.

Do these include effects on aquatic species at risk*? ( ) Yes (●) No

If yes, please describe, including how many individuals will be harmed, harassed, or otherwise affected by the project, and how?

All definitions are provided in Section G of the Guidance on Submitting a Request for Review

Do these include effects on areas identified as their residence or critical habitat? ○ Yes ◉ No

If yes, please describe

Are there any aquatic invasive species in the vicinity of your project area? ○ Yes ◉ No

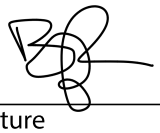
(If yes, identify which ones.)

Does your project aim to, or will it be likely to, effect any of these aquatic invasive species? ○ Yes ◉ No

If yes, how?

F) Signature

I, Barry Myler (print name) certify that the information given on this form is to the best of my knowledge, correct and completed.



Signature

15/11/2022
Date

Information about the above-noted proposed work or undertaking is collected by DFO under the authority of the *Fisheries Act* for the purpose of administering the Fish and Fish Habitat protection provisions of the *Fisheries Act*. Personal information will be protected under the provisions of the *Privacy Act* and will be stored in the Personal Information Bank DFO-PPU-680. Under the *Privacy Act*, Individuals have a right to, and on request shall be given access to any personal information about them contained in a personal information bank. Instructions for obtaining personal information are contained in the Government of Canada's Info Source publications available at www.infosource.gc.ca or in Government of Canada offices. Information other than "personal" information may be accessible or protected as required by the provision of the *Access to Information Act*.

**All definitions are provided in Section G of the Guidance on Submitting a Request for Review*

**All definitions are provided in Section G of the Guidance on Submitting a Request for Review*

Guidance on Submitting a Request for Review

This document explains the requirements for a Request for Review by DFO under the fish and fish habitat protection provisions of the *Fisheries Act*. To determine whether you should request a review, visit DFO's Projects Near Water webpage (http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html).

Incomplete Requests for Review will be returned to the applicant without review by DFO. All information requested must be provided. If you attach documents to your application with additional information, you must still provide appropriate summaries in the spaces provided on the application document or your application will be considered incomplete.

Section A: Contact Information

Provide the full legal name of the proponent and primary mailing address for the proponent. When the proponent is a company, identify the full legal registered name of the company.

If applicable, also provide the contact information of the duly authorized representative of the proponent. Please note that a copy of correspondence to Contractor/Agency/Consultant will also be sent to the Proponent.

Section B: Description of Project

This information is meant to provide background about the proposed project. All components of the proposed project in or near water, must be described.

Proponents should provide information about all appropriate phases of the project, i.e., the construction, operation, maintenance and closure phases for the proposed project.

All details about the construction methods to be used, associated infrastructure, permanent and temporary structure, structure type (e.g. corrugated steel pipe vs box culvert), structures dimension, building materials to be used, machinery and equipment to be used must also be provided. For example, the construction of p**ermanent structures** may require the construction of temporary structures such as temporary dikes, in conjunction with other associated activities like the withdrawal of water, land clearing, excavation, grading, infilling, blasting, dredging, installing structures, draining or removing debris from water. Similarly, the equipment and materials to be used may include hand tools, backhoes, gravel, blocks or armor stone (provide the average diameter), concrete (indicate if pre-cast or poured in-water), steel beams or wood.

When physical structures in or near water are proposed, provide the plan and specifications of those works which would require a review.

Section C: Location of the Project

The purpose for this information is to describe and illustrate the location of the proposed project, and to provide geographical and spatial context. The information should also facilitate an understanding of how the project will be situated in relation to existing structures.

The details to be provided must include:

- Coordinates of the project (e.g., Latitude and Longitude or Universal Transverse Mercator Grid coordinates);
- A map(s), site plan, or diagrams indicating the high water mark and the location, size and nature of proposed and existing structures (e.g., floating or fixed), landmarks and proposed activities. In a marine setting, it may be helpful to depict the approximate location of the proposed development on a nautical chart or showing the relation of the site to sea marks or other navigational aids. These plans, maps or diagrams should be at an appropriate scale to help determine the relative size of the proposed structures and activities, the proximity to the watercourse or waterbody and the distance from existing structures;
- The community nearest to the location of the proposal as means to provide a general reference point. When possible, proponents should use geographical names recognized by the Geographical Names Board of Canada (http://www.nrcan.gc.ca/earth-sciences/geography-boundary/geographical-name/11680).
- If available, provide aerial photographs or satellite imagery of the water source(s) and waterbody(ies);
- Names of the watershed(s), water source(s) and/or waterbody(ies) likely to be affected by the proposal; and
- Brief directions to access the proposed project site.

**All definitions are provided in Section G of the Guidance on Submitting a Request for Review*

Section D: Description of the Aquatic Environment

Proponents must describe the environmental context and aquatic resources present at the proposed site. The information must identify the current state of the fish and fish habitat prior to the carrying on of the project.

It is important to include information about the fish species present, the biological, chemical, physical features present (habitat characteristics), and the fish life-cycle functions (fish characteristics).

The spatial scope for assessing fish and fish habitat should encompass the direct physical footprint of the project, and the upstream and downstream areas affected.

As an example, the following is a non-exhaustive and non-prescriptive list of some common attributes which may characterize the aquatic environment:

- Type of water source or watercourse (groundwater, river, lake, marine, estuary, etc.);
- Characteristics of the water source or waterbody could include:
  - Substrate characterization - describe the types of substrate (e.g., bedrock, boulder, cobble, gravel etc.), identify the predominant substrate type (e.g., 80% cobble, 20% gravel etc.) and provide maps of the substrate;
  - Aquatic and riparian vegetation characterization - identify the prevalent types of vegetation (e.g. rooted, submerged, emergent, etc.), identify the relative abundance of the vegetation (e.g., 10% cattails, 80% grass, 10% sedge) , indicate the predominant vegetation (e.g., by species or types) and identify the vegetation densities (e.g., type of vegetation/ area);
  - Flow characterization - specify if the flow is controlled or if it is natural, identify if the flow is permanent or intermittent, identify the current and tide (marine environment) etc.;
  - Physical waterbody characterization - identify the average depth of water for water bodies, identify bathymetry of water bodies, provide bathymetric maps where available, channel width (determine the width of the channel from the high water mark), slope ;
  - Water quality characterization - (e.g., annual or average pH, salinity, alkalinity, total dissolved solids, turbidity, temperature etc.);
  - Biological water quality characterization - (e.g., benthic macro-invertebrates, zooplankton, phytoplankton, etc.)
- Fish species characterization - identify the fish species (including molluscs, crustaceans, etc.) known or suspected to be in the area, predator prey relationships etc. Identify what source of information was used to determine the presence of fish in that area; and
- Estimate the fish abundance - estimate the number of fish present, estimate the year class for each species etc.

There are many different methods and attributes available to characterize fish and fish habitat. Proponents must describe all sources of information used, all fish and environment sampling techniques used, all modelling techniques used and all other approaches used to define the fish and fish habitat. Proponents are encouraged to use recognized fisheries inventory methods such as those approved by DFO or provinces and territories, and/or scientifically defensible methodologies and techniques whenever possible.

Whenever possible, proponents should support descriptions of the aquatic environment with the use of detailed drawings, such as plans or maps and photographs of the habitat features. In an offshore marine setting, photos may not be useful to depict the proposed development site. Instead describe and/or sketch the specific features of the sea floor which may include the presence of submarine features such as canyons, cliffs, caverns, etc.

Section E: Potential Effects of the Proposed Project

The objective of this section is to identify all anticipated effects on fish and fish habitat likely to be caused by the project. Proponents should consider all mitigation or avoidance techniques.

The description must include qualitative and/or quantitative information about the predicted/potential effects to fish species and fish habitat. Some examples of likely effects may include mortality to fish, area of habitat loss, change to flow, changes to habitat function, reduction in prey availability etc.

**All definitions are provided in Section G of the Guidance on Submitting a Request for Review*

The spatial scope of the aquatic effects assessment would include the direct physical "footprint" of the proposed project, and any areas indirectly affected, such as downstream or upstream areas. The footprint of each component of the project below the higher water mark should be provided individually. This may also include areas in or on the water, on the shoreline, coast or bank(s) (i.e., in the riparian zone).

The assessment must include the following attributes:

- Identification of all fish species affected by the proposed project as well as their life stages (e.g., juvenile, yearling, adult, etc.);
- Identification of the type of fish habitat affected (e.g., spawning habitat - gravel and cobble, feeding and rearing areas - side channel slough, small tributaries, etc.), estimate of the affected area (e.g., square meters or hectares);
- Description of the effect (e.g., mortality to fish from entrapment, delayed migration of spawning adults, reduction in prey availability, etc.)
- Probability of the effect - this is the likelihood of the effect occurring (e.g., probability of fish strike from turbines for specific fish sizes, probability of sediment plume within a distance from source, etc., or qualitative assessment: low, medium, high)
- Magnitude of the effect - this is the intensity or severity of the effect (e.g., total number of fish affected, or qualitatively assessment: low, medium, high).
- Geographic extent of the effect - this is the spatial range of the effect (e.g., localized to 100m from the work, channel reach or lake region, entire watershed etc.); and
- Duration of the effect - this is the temporal period for which the effect will persist (e.g., duration of delay to fish migration in hours, days, months or years).

The information to be provided must also describe the methods and techniques used to conduct the assessment. As much as possible, methods and techniques used should be scientifically defensible.

The schedule should, at minimum, identify the proposed start and end dates for carrying out each proposed activity, and where applicable, identify the respective phase of the proposal; i.e., the construction, operation, maintenance and closure phases. In some cases, in order to provide additional context, it may be relevant to identify other information such as the expected life span of permanent and temporary structures.

Proponents must provide comprehensive information about all available measures that are proposed to avoid or mitigate potential harmful alteration, disruption or destruction of fish habitat, or death of fish (e.g., in standards or codes of practice).

Residual harmful impacts that remain after the application of such measures.

It is important to clearly describe and quantify harmful impacts because DFO will use this information as part of its decision making on whether harmful alteration, disruption or destruction of fish habitat or death of fish is likely and an authorization is required under subsection 35(2)(*b*) or 34.4(2)(b) of the *Fisheries Act*.

Section F: Submission and Signature

The proponent must sign their application. A signed original of the Request for Review must be provided to the regional DFO office (http://www.dfo-mpo.gc.ca/pnw-ppe/contact-eng.html), even if an electronic copy was sent by email. Should the review of your project indicate that harmful alteration, disruption or destruction of fish habitat or death of fish is likely, the information provided in the Request for Review document can be referred to in the subsequent application for an authorization under Paragraphs 35(2)(*b*) or 34.4 of the *Fisheries Act*.

Section G: Definitions

Aquatic Species at Risk: an extirpated, endangered, threatened species, or a species of special concern. A non-exhaustive list of aquatic species at risk found in Canadian waters can be found here (http://www.dfo-mpo.gc.ca/species-especes/sara-lep/identify-eng.html).

Aquatic Species at Risk Critical Habitat
the habitat that is necessary for the survival or recovery of a listed wildlife species and that is identified as the species critical habitat in the recovery strategy or in an action plan for the species.

**All definitions are provided in Section G of the Guidance on Submitting a Request for Review*

Aquatic Species at Risk Residence: the specific dwelling place, such as a den, nest or other similar area or a place that is occupied or habitually occupied by one or more individuals during all or part of their life cycles, including breeding, rearing, staging, wintering, feeding, or hibernating.

Aquatic invasive species: are fish, invertebrate or plant species that have been introduced into a new aquatic environment, outside of their natural range. Once introduced, aquatic invasive species populations can grow quickly because they don't have natural predators in their new environment. As a result, they can outcompete and harm native species. They can even alter habitats to make them inhospitable for the native species. A non-exhaustive list of aquatic invasive species can be found here (http://www.dfo-mpo.gc.ca/species-especes/ais-eae/identify-eng.html).

Emergency circumstance: If your project must be conducted in response to an emergency, you may apply for an Emergency Authorization. The emergency situations are:

- The project is required as a matter of national security
- The project is being conducted in response to a national emergency where special temporary measures are being taken under the federal *Emergencies Act*
- The project is required to address an emergency that poses a risk to public health or safety or to the environment or property.

Fish habitat: means habitat that can directly or indirectly support life processes. This includes but is not limited to: spawning grounds, nursery, rearing, food supply and migration areas.

Harmful alteration, disruption or destruction means any temporary or permanent change to fish habitat that directly or indirectly impairs the habitat's capacity to support one or more life processes of fish.

High Water Mark: The usual or average level to which a body of water rises at its highest point and remains for sufficient time so as to leave a mark on the land.

**All definitions are provided in Section G of the Guidance on Submitting a Request for Review*

Fisheries and Oceans Canada
Pêches et Océans Canada

Ontario and Prairie Region
Fish and Fish Habitat Protection Program
867 Lakeshore Rd.
Burlington, ON
L7S 1A1

Région de l'Ontario et des Prairies
Programme de protection du poisson et de son habitat
867 chemin Lakeshore
Burlington, ON
L7S 1A1

December 22, 2022

Our file *Notre référence*
22-HCAA-02762

Andrew Bear
5205 King St. Suite 5
Beamsville, ON
L3J 1P6

Subject: Watercourse Realignment, Konkle Creek, Town of Lincoln (22-HCAA-02762) – Implementation of Measures to Avoid and Mitigate the Potential for Prohibited Effects to Fish and Fish Habitat

Dear Andrew Bear:

The Fish and Fish Habitat Protection Program (the Program) of Fisheries and Oceans Canada (DFO) received your proposal on November 15, 2022. We understand that you propose to:

- ***Realign 100 m of Konkle Creek channel (200 m^2); and***
- ***Install a 51.3 m by 900 mm piped enclosure extension from existing upstream culvert.***

Our review considered the following information:

- Request for Review form and associated documents submitted on November 15, 2022.

Your proposal has been reviewed to determine whether it is likely to result in:

- the death of fish by means other than fishing and the harmful alteration, disruption or destruction of fish habitat which are prohibited under subsections 34.4(1) and 35(1) of the *Fisheries Act*; and
- effects to 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*.

The aforementioned impacts are prohibited unless authorized under their respective legislation and regulations.

To avoid and mitigate the potential for prohibited effects to fish and fish habitat (as listed above), we recommend implementing the measures listed below:

- Plan in-water works, undertakings and activities to respect timing windows to protect fish, including their eggs, juveniles, spawning adults and/or the organisms upon which they feed and migrate ;
    - No in-water work March 15th to July 15th
- Capture, relocate and monitor for fish trapped within isolated, enclosed, or dewatered areas;
    - Dewater gradually to reduce the potential for stranding fish
- Conduct in-water undertakings and activities during periods of low water levels;
- Screen intake pipes to prevent entrainment or impingement of fish;
    - Use the code of practice for water intake screens
- Limit impacts on riparian vegetation to those approved for the work, undertaking or activity;
    - Limit access to banks or areas adjacent to waterbodies
    - Construct access points and approaches perpendicular to the watercourse or waterbody
    - Re-vegetate the disturbed area with native species suitable for the site
- Restore stream geomorphology (i.e., restore the bed and banks, gradient and contour of the waterbody) to its initial state;
- Avoid introducing sediments (e.g., silts, clays and sand) in the water;
- Develop and implement an erosion and sediment control plan to avoid or minimize the introduction of sediment into any waterbody during all phases of the work, undertaking or activity; and
    - Conduct all in-water works, undertakings or activities in isolation of open or flowing water to reduce the introduction of sediment into the watercourse
    - Monitor the watercourse to observe signs of sedimentation during all phases of the work, undertaking or activity and take corrective action
- Develop and implement a response plan to avoid a spill of deleterious substances.

Provided that you incorporate these measures into your plans, the Program is of the view that your proposal is not likely to result in the contravention of the above mentioned prohibitions and requirements.

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 remain in compliance with the *Fisheries Act* and the *Species at Risk Act*.

It is also your *Duty to Notify* DFO if you have caused, or are about to cause, the death of fish by means other than fishing and/or the harmful alteration, disruption or destruction of fish habitat. Such notifications should be directed to (http://www.dfo-mpo.gc.ca/pnw-ppe/CONTACT-eng.html).

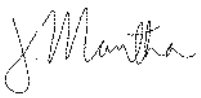
We recommend that you notify this office at least 10 days before starting your project and that a copy of this letter be kept on site while the work is in progress. It remains your

.../3

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 Jessica Mantha at Jessica.mantha@dfo-mpo.gc.ca. Please refer to the file number referenced above when corresponding with the Program.

Yours sincerely,



Jessica Mantha
Biologist | Biologiste
Fisheries and Oceans Canada| Pêches et Océans Canada
Fish and Fish Habitat Protection Program | Programme de Protection du Poisson et de Son Habitat
Email/Courriel: Jessica.Mantha@dfo-mpo.gc.ca

APPENDIX 3:
Plant Species List

Botanical Inventory - 5205 King St, Beamsville

Scientific Name	Common Name	Niagara Status NAI (2010)	SRANK
Trees			
Acer negundo	Manitoba Maple	Common (Native)	S5
Acer platanoides	Norway Maple	Introduced (Common)	SE5
Fraxinus pennsylvanica	Red/Green Ash	Common (Native)	S5
Juglans nigra	Black Walnut	Common (Native)	S4
Juglans x bixbyi	Japanese Walnut - Butternut Hybrid	hybrid	SNA
Juniperus virginiana	Eastern Red Cedar	Common (Native)	S5
Salix alba	White Willow	Introduced (Uncommon)	SE4
Thuja occidentalis	Eastern White Cedar	Uncommon (Native)	S5
Ulmus pumila	Siberian Elm	Introduced (Uncommon)	SE3
Shrubs & Vines			
Cornus foemina	Gray Dogwood	Common (Native)	S5
Crataegus mollis	Downy Hawthorn	Common (Native)	S5
Ligustrum vulgare	European Privet	Introduced (Common)	SE5
Lonicera tatarica	Tartarian Honeysuckle	Introduced (Common)	SE5
Parthenocissus inserta	Virginia Creeper	Common (Native)	S5
Rhamnus cathartica	Common Buckthorn	Introduced (Common)	SE5
Rhus typhina	Staghorn Sumac	Common (Native)	S5
Rosa blanda	Smooth Wild Rose	Common (Native)	S5
Rosa multiflora	Multiflora Rose	Introduced (Common)	SE4
Rosa rubiginosa	Sweetbrier	Introduced (Rare)	SE4
Rubus occidentalis	Black Raspberry	Common (Native)	S5
Salix bebbiana	Bebb's Willow	Common (Native)	S5
Salix discolor	Pussy Willow	Common (Native)	S5
Vitis aestivalis	Summer Grape	Common (Native)	S4
Vitis riparia	Riverbank Grape	Common (Native)	S5
Herbaceous Plants			
Allaria petiolata	Garlic Mustard	Introduced (Common)	SE5
Allium canadense	Wild Garlic	Uncommon (Native)	S5
Allium schoenoprasum	Wild Chives	Introduced (Rare)	S4
Arctium minus	Common Burdock	Introduced (Common)	SE5
Calystegia sepium	Hedge Bindweed	Common (Native)	S5

Botanical Inventory - 5205 King St, Beamsville

Scientific Name	Common Name	Niagara Status NAI (2010)	SRANK
Carex blanda	Woodland Sedge	Common (Native)	S5
Centaurea stoebe ssp. micranthos	Spotted Knapweed	Introduced (Uncommon)	SE5
Circaea lutetiana	Enchanter's-nightshade	Common (Native)	S5
Cirsium arvense	Canada Thistle	Introduced (Common)	SE5
Convolvulus arvensis	Field Bindweed	Introduced (Common)	SE5
Dactylis glomerata	Orchard Grass	Introduced (Common)	SE5
Daucus carota	Wild Carrot	Introduced (Common)	SE5
Galium aparine	Cleavers	Common (Native)	S5
Geum aleppicum	Yellow Avens	Common (Native)	S5
Geum canadense	White Avens	Common (Native)	S5
Glechoma hederacea	Gill-over-the-ground	Introduced (Common)	SE5
Hesperis matrionalis	Dame's Rocket	Introduced (Common)	SE5
Impatiens capensis	Spotted Touch-me-not	Common (Native)	S5
Linaria vulgaris	Butter-and-eggs	Introduced (Common)	SE5
Lolium perenne	Perennial Rye Grass	Introduced (Uncommon)	SE4
Lysimachia nummularia	Moneywort	Introduced (Common)	SE5
Melilotus alba	White Sweet-clover	Introduced (Common)	SE5
Myosotis laxa	Smaller Forget-me-not	Common (Native)	S5
Nepeta cataria	Catnip	Introduced (Common)	SE5
Onothera biennis	Hairy Yellow Evening-primrose	Common (Native)	S5
Oxalis stricta	European Wood-sorrel	Common (Native)	S5
Persicaria maculosa	Lady's-thumb	Introduced (Common)	SE5
Phalaris arundinacea	Reed Canary Grass	Introduced (Common)	SE5
Plantago lanceolata	English Plantain	Introduced (Common)	SE5
Poa pratensis ssp. Pratensis	Kentucky Blue Grass	Introduced (Common)	SE5
Prunella vulgaris	Heal-all	Common (Native)	S5
Rumex crispus	Curly Dock	Introduced (Common)	SE5
Setaria pumila	Yellow Foxtail	Introduced (Common)	SE5
Solidago altissima	Late Goldenrod	Common (Native)	S5
Solidago caesia	Blue-stem Goldenrod	Common (Native)	S5
Solidago canadensis	Canada Goldenrod	Common (Native)	S5
Symphyotrichum novae-angliae	New England Aster	Common (Native)	S5
Symphyotrichum puniceum	Purple-stemmed Aster	Common (Native)	S5
Taraxacum officinale	Common Dandelion	Introduced (Common)	SE5

Botanical Inventory - 5205 King St, Beamsville

Scientific Name	Common Name	Niagara Status NAI (2010)	SRANK
Trifolium pratense	Red Clover	Introduced (Common)	SE5
Tussilago farfara	Coltsfoot	Introduced (Common)	SE5
Urtica dioica	American Stinging Nettle	Common (Native)	S5
Vicia cracca	Cow Vetch	Introduced (Common)	SE5
Viola sororia	Common Blue Violet	Common (Native)	S5

APPENDIX 4:

Breeding Bird Survey Summary Table

Breeding Bird Survey - 5205 King St, Beamsville

Common Name	Scientific Name	16-Jun-22	04-Jul-22	Niagara Status (NAI, 2010)	SRANK	OBBA Breeding Evidence Codes (see below)	Summary Breeding Evidence	Notes
Killdeer	Charadrius vociferus	X		common resident	S4B	A	Probable	
Blue Jay	Cyanocitta cristata		X	very common permanent resident	S5	A	Probable	
Barn Swallow	Hirundo rustica		X	very common resident	S4B	flyover	Observed	foraging, no nest habitat
European Starling	Sturnus vulgaris		X	very common permanent resident	SNA	X	Observed	
American Robin	Turdus migratorius	X	X	very common resident	S5	S, A	Probable	
House Wren	Troglodytes aedon	X	X	common resident	S5B	S	Probable	
House Sparrow	Passer domesticus		X	very common permanent resident	SNA	X	Observed	no nest habitat on site
American Goldfinch	Carduelis tristis	X	X	common resident	S5	flyover	Observed	no sign of nesting, territoriality
Chipping Sparrow	Spizella passerina	X		common resident	S5B	A	Probable	
Song Sparrow	Melospiza melodia	X	X	very common resident	S5	S, A	Probable	
Red-winged Blackbird	Agelaius phoeniceus		X	very common resident	S5	flyover	Observed	
Common Grackle	Quiscalus quiscula	X		very common resident	S5	X	Observed	
Northern Cardinal	Cardinalis cardinalis	X		common permanent resident	S5	S, P	Probable	

OBSERVED

X Species observed in its breeding season (no breeding evidence).

POSSIBLE

H Species observed in its breeding season in suitable nesting habitat.

S Singing male(s) present, or breeding calls heard, in suitable nesting habitat in breeding season.

PROBABLE

P Pair observed in suitable nesting habitat in nesting season.

T Permanent territory presumed through registration of territorial behaviour (song, etc.) on at least two days, a week or more appart, at the same place.

D Courtship or display, including interaction between a male and a female or two males, including courtship feeding or copulation.

V Visiting probable nest site

A Agitated behaviour or anxiety calls of an adult.

B Brood Patch on adult female or cloacal protuberance on adult male.

N Nest-building or excavation of nest hole.

CONFIRMED

DD Distraction display or injury feigning.

NU Used nest or egg shells found (occupied or laid within the period of the survey).

FY Recently fledged young (nidicolous species) or downy young (nidifugous species), including incapable of sustained flight.

AE Adult leaving or entering nest sites in circumstances indicating occupied nest.

FS Adult carying fecal sac.

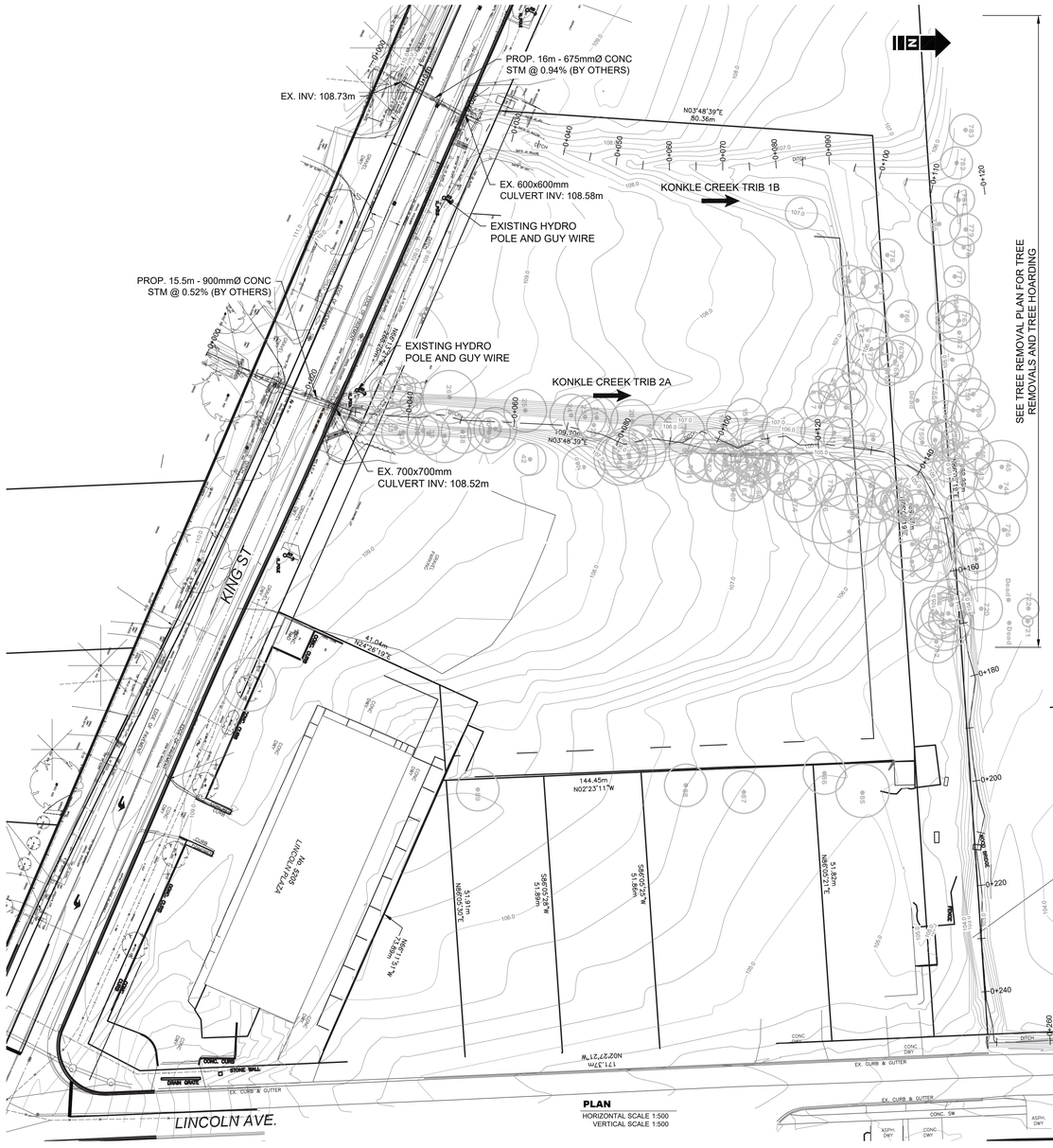
CF Adult carying food for young.

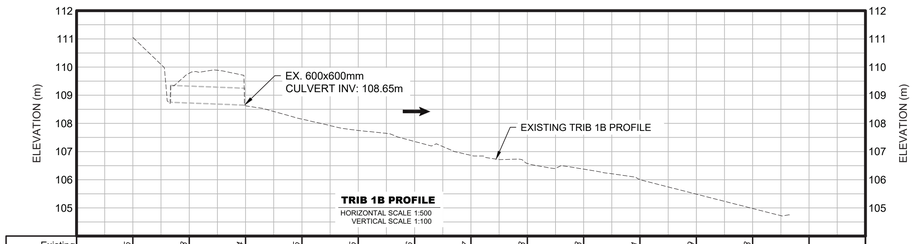
NE Nest containing eggs.

NY Nest with young seen or heard.

APPENDIX 5:

Excerpts of Matrix Solutions Realignment Design, Staging, and Landscape Plan





Chainage	0+000	0+010	0+020	0+030	0+040	0+050	0+060	0+070	0+080	0+090	0+100	0+110	0+120	0+130
Existing Grade on Centerline	111.05	109.78	108.64	108.15	107.75	107.36	106.87	106.58	106.38	106.01	105.49	104.98		
Proposed Grade on Centerline	111.05	109.78	108.64	108.15	107.75	107.36	106.87	106.58	106.38	106.01	105.49	104.98		

Chainage	0+000	0+010	0+020	0+030	0+040	0+050	0+060	0+070	0+080	0+090	0+100	0+110	0+120	0+130	0+140	0+150	0+160	0+170	0+180	0+190	0+200	0+210	0+220	0+230	0+240	0+250	0+260	0+270	0+280	0+290	0+300	0+308
Existing Grade on Centerline		109.90	109.84	109.04	107.23	106.75	106.45	106.15	105.85	105.58	105.70	105.23	105.07	104.81	104.67	104.51	103.82	103.74	103.43	103.38	103.20	103.23	103.04	102.72	102.87	102.61	102.24	102.19	101.94	103.09	101.78	
Proposed Grade on Centerline		109.90	109.84	108.04	107.23	106.75	106.45	106.15	105.85	105.58	105.70	105.23	105.07	104.81	104.67	104.51	103.82	103.74	103.43	103.38	103.20	103.23	103.04	102.72	102.87	102.61	102.24	102.19	101.94	103.09	101.78	
Chainage	0+000	0+010	0+020	0+030	0+040	0+050	0+060	0+070	0+080	0+090	0+100	0+110	0+120	0+130	0+140	0+150	0+160	0+170	0+180	0+190	0+200	0+210	0+220	0+230	0+240	0+250	0+260	0+270	0+280	0+290	0+300	0+308

GENERAL NOTES

1. THE POSITION OF POLES, LINES, CONDUITS, WATERMAINS, SEWERS AND OTHER UNDERGROUND UTILITIES AND STRUCTURES IS NOT NECESSARILY SHOWN ON THE CONTRACT DRAWINGS, AND WHERE SHOWN, THE ACCURACY OF THE POSITION OF SUCH UTILITIES AND STRUCTURES IS NOT GUARANTEED. BEFORE STARTING WORK, THE CONTRACTOR SHALL INFORM HIMSELF OF THE EXACT LOCATION OF ALL SUCH UTILITIES AND STRUCTURES, AND SHALL ASSUME ALL LIABILITY FOR DAMAGE TO THEM.
2. ALL DIMENSIONS AND LOCATION OF ALL AND ANY EXISTING UTILITIES WILL BE CHECKED AND VERIFIED BY THE CONTRACTOR PRIOR TO COMMENCING CONSTRUCTION OF THE WORKS SHOWN HEREON. ANY DISCREPANCY WILL BE REPORTED IMMEDIATELY TO THE ENGINEER.
3. THE MUNICIPALITY REQUIRES THAT THE PROPOSED CIVIL WORKS (SITE SERVICING, GRADING, DRAINAGE, SURFACE WORKS) DETAILED ON THIS DRAWING SET, ARE REVIEWED BY THE DESIGN ENGINEER DURING CONSTRUCTION. ANY CHANGES TO THE SITE PLAN, AND/OR CIVIL DRAWINGS CAN ONLY BE MADE IN CONSULTATION WITH THE DESIGN ENGINEER. THE DESIGN ENGINEER MUST BE GIVEN A MINIMUM OF 48 HOURS NOTICE PRIOR TO CONSTRUCTION OF ANY CIVIL WORKS DETAILED ON THIS DRAWING SET, IN ORDER TO ARRANGE FOR SITE PERSONNEL.
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- EXISTING BOTTOM OF SLOPE
- CHANNEL CENTRELINE
- 2+000 CHANNEL CHAINAGE
- EXISTING TREES
- 7.9 TREE LABELS

REFERENCE:

1 : 500 metres (10 0 10 20) HORIZONTAL

1 : 300 metres (6 0 6 12) VERTICAL

MATRIX SOLUTIONS INC.
CERTIFICATE OF AUTHORIZATION
No.: 100187406
Professional Engineers Ontario

No.	DATE	DESCRIPTION	BY	CHK.	DRN.
1	2023/05/18	ISSUED FOR APPROVAL	MP	NK	KV

REVISION

Matrix Solutions Inc. ENVIRONMENT & ENGINEERING

URBANLINK
KONKLE CREEK TRIBUTARY 2A, 1B REALIGNMENT

TRIBUTARY 1B & 2A
EXISTING PLAN AND PROFILES

DATE:	TECHNICAL:	REVIEWER:	DRAWN:
MAY 2023	N. KRYGSMAN	M. PUSHKAR	K. VANDER

PROJECT: 35511-522
REVISION: 3
SHEET: 2

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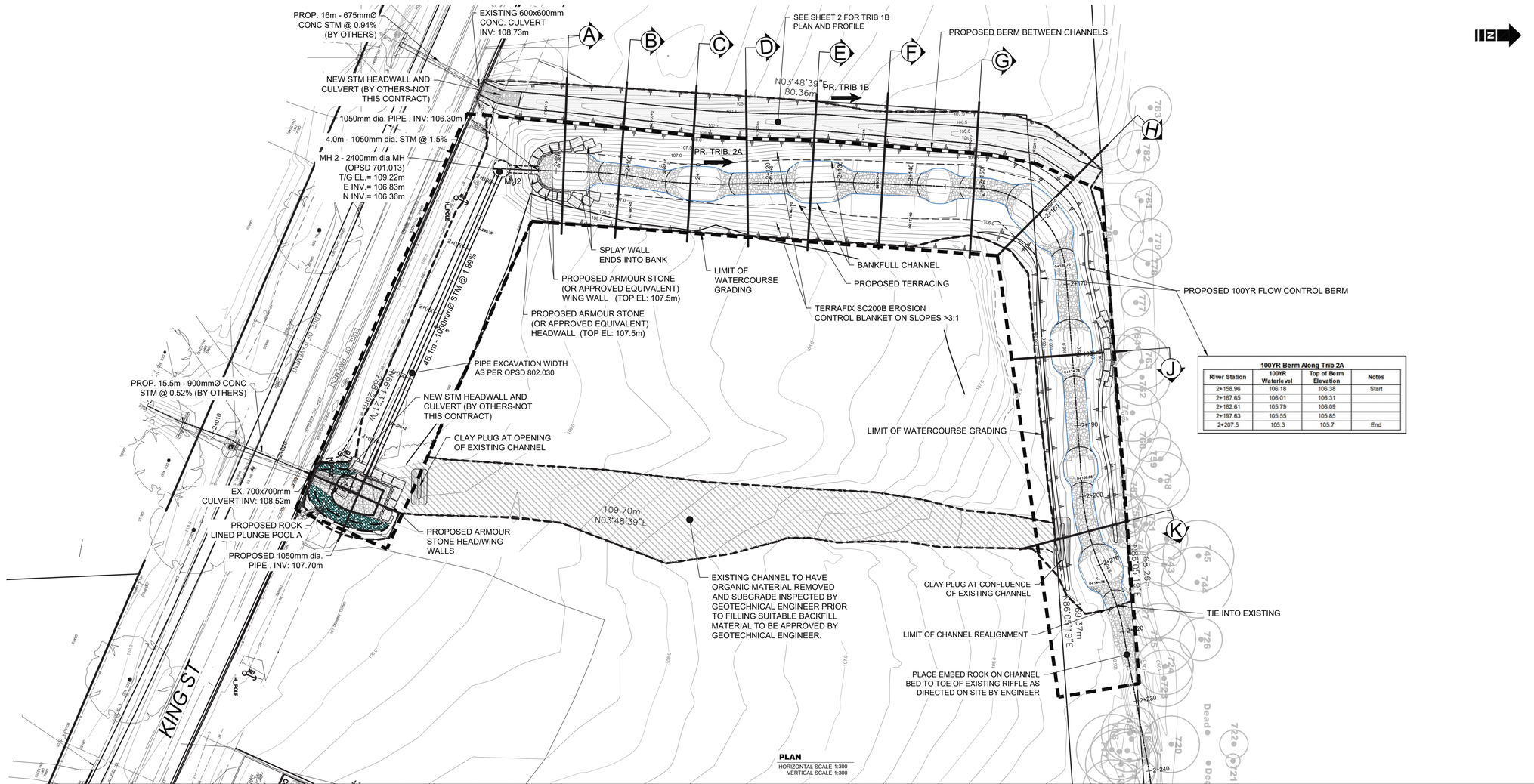
= 20 mm WHEN PRINTED ON ARCH D - 24" x 36" (L)

N:\PROJECTS\35511 - Urbanlink - Bowmanville Creek\03 Data\DrawPlus\Urbanlink_Bowmanville_Design Jeys - Existing - May 18, 2023 5:15:53 PM - Kelly Vanderlaan


EXISTING 600x600mm CONC. CULVERT INV: 108.58m
TIE PROPOSED SWALE INTO EXISTING CULVERT
PROP. 16m - 675mmØ CONC STM @ 0.94% (BY OTHERS)
EXISTING 600x600mm CONC. CULVERT INV: 108.73m
NEW STM HEADWALL AND CULVERT (BY OTHERS-NOT THIS CONTRACT)
MH 2
2400mm dia MH
(OPSD 701.013)
T/G EL.= 109.22m
E INV.= 106.83m
N INV.= 106.36m
MH2
PR. TRIB 1B
N03°48'39"E
80.36m
LIMIT OF WATERCOURSE GRADING
TERRAFIX SC200B EROSION CONTROL BLANKET ON SLOPES >3:1
LOW FLOW CHANNEL
TIE INTO EXISTING
PR. TRIB. 2A
LINE THE FIRST 6.0m OF SWALE WITH ROCK SOIL MIX (VALLEY FLOOR MIX) (SEE ROCK MIX TABLE)
SEE SHEET 3 FOR TRIB 2A PLAN AND PROFILE
46.1m - 1050mmØ STM @ 1.89%
PROP. 15.5m - 900mmØ CONC STM @ 0.52% (BY OTHERS)
NEW STM HEADWALL AND CULVERT (BY OTHERS-NOT THIS CONTRACT)
CLAY PLUG AT OPENING OF EXISTING CHANNEL
LIMIT OF WATERCOURSE GRADING
EX. 700x700mm CULVERT INV: 108.52m
PROPOSED ROCK LINED PLUNGE POOL A
PROPOSED ARMOUR STONE HEAD/WING WALLS
109.70m
N03°48'39"E
EXISTING CHANNEL TO HAVE ORGANIC MATERIAL REMOVED AND SUBGRADE INSPECTED BY GEOTECHNICAL ENGINEER PRIOR TO FILLING; SUITABLE BACKFILL MATERIAL TO BE APPROVED BY GEOTECHNICAL ENGINEER.
CLAY PLUG AT CONFLUENCE OF EXISTING CHANNEL
PROPOSED 1050mm dia. PIPE . INV: 107.70m
N86°05'19"E
68.26m
N86°05'19"E
63.37m
0+114.74
0+129.69
0+089.24
0+084.18
0+068.71
COOK BRIDGE
Dead
Dead
PLAN
HORIZONTAL SCALE 1:300
VERTICAL SCALE 1:300

EXISTING 600x600mm CONC. CULVERT
INV: 108.73m
INV: 108.58m
2.0%
2.0%
5.1%
6 m
LINE THE FIRST 6.0m OF SWALE WITH ROCK SOIL MIX (VALLEY FLOOR MIX) (SEE ROCK MIX TABLE)
PROPOSED SWALE - TRIBUTARY 1B PROFILE
PR. TRIB 1B
3.8%
5.1%
EXISTING GRADE
ELEVATION (m)
111
110
109
108
107
106
105
104
TRIB 1B PROFILE
HORIZONTAL SCALE 1:300
VERTICAL SCALE 1:60

| | | |



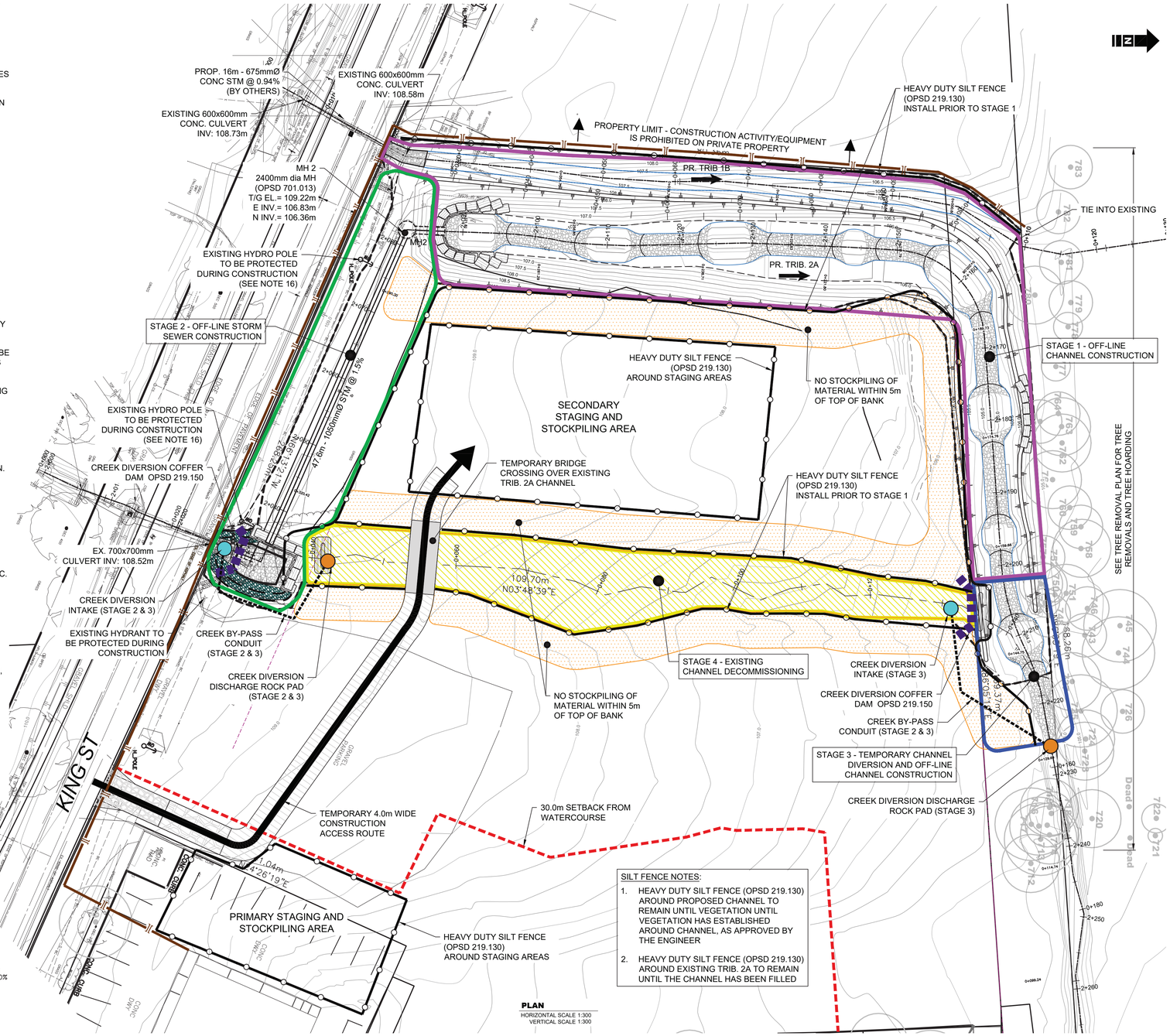
100YR Berm Along Trib 2A

River Station	100YR Waterlevel	Top of Berm Elevation	Notes
2+158.96	106.18	106.38	Start
2+167.65	106.01	106.31	
2+182.61	105.79	106.09	
2+197.63	105.55	105.85	
2+207.5	105.3	105.7	End

| | | |

CONSTRUCTION STAGING AND ENVIRONMENTAL PROTECTION PLAN NOTES

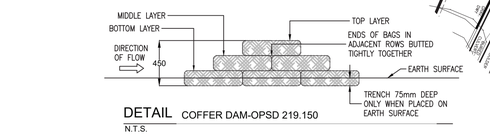
1. ALL FLOW MANAGEMENT, BARRIER FOR TREE PROTECTION AND EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IN PLACE PRIOR TO THE INITIATION OF STAGED CONSTRUCTION ACTIVITIES.
2. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION, ALL BENCHMARKS, ELEVATIONS, DIMENSIONS, AND GRADES MUST BE CHECKED BY THE CONTRACTOR AND ANY DISCREPANCIES ARE TO BE REPORTED TO THE ENGINEER.
3. ALL UNSUITABLE AND/OR EXCESS MATERIAL IS TO BE DISPOSED OF AT AN OFF-SITE LOCATION APPROVED BY THE TOWNSHIP, ARRANGED BY THE CONTRACTOR.
4. ALL MEASUREMENTS FOR THIS PROJECT ARE IN METRIC UNLESS OTHERWISE INDICATED.
5. DURING CONSTRUCTION ALL VEGETATION AND STRUCTURES ADJACENT TO THE WORK AREA ARE TO BE PROTECTED OR RESTORED TO ORIGINAL CONDITION.
6. ALL WORKS AND MATERIALS ARE TO BE IN ACCORDANCE WITH APPLICABLE ONTARIO PROVINCIAL STANDARD SPECIFICATIONS AND NIAGARA PENINSULA CONSERVATION AUTHORITY (NPCA).
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL LAYOUT, SURVEY, AND LOCATION OF UTILITIES. THE CONTRACTOR IS TO MEET ALL REQUIREMENTS OF THE OWNERS OF THE UTILITIES ON THIS PLAN AND MUST MAKE SATISFACTORY ARRANGEMENTS WITH THE UTILITY COMPANIES FOR CROSSING THEIR INSTALLATIONS AND FOR PROVIDING ADEQUATE PROTECTION DURING CONSTRUCTION.
8. DISTURBED AREAS WILL BE MINIMIZED TO THE EXTENT POSSIBLE, AND TEMPORARILY OR PERMANENTLY STABILIZED OR RESTORED AS THE WORK PROGRESSES.
9. THE CONTRACTOR SHALL FOLLOW PHASED CONSTRUCTION SEQUENCE AS SHOWN UNLESS OTHERWISE APPROVED BY CONTRACT ADMINISTRATOR AND/OR ENGINEER. PERMANENT EROSION CONTROL MEASURES (CHANNEL SUBSTRATE AND RIVERSTONE) SHALL IMMEDIATELY FOLLOW COMPLETION OF SLOPE GRADING AND CHANNEL CONSTRUCTION.
10. THE CONTRACTOR IS RESPONSIBLE FOR MONITORING THE WEATHER FORECAST AND SHALL BE PREPARED TO TEMPORARILY SECURE THE STAGED WORK ZONE IF ELEVATED WATER LEVELS ARE ANTICIPATED.
11. DEWATERING AND FISH SAVAGE TO BE COMPLETED PRIOR TO DECOMMISSIONING OF EXISTING CHANNEL AND FOLLOWING PERIODS OF ELEVATED WATER LEVELS.
12. DEWATERING DISCHARGE SHALL BE DIRECTED TO THE APPROPRIATE DISCHARGE LOCATION AT ALL TIMES. WATER QUALITY OF TREATED DEWATERING DISCHARGE TO BE MONITORED THROUGHOUT THE DURATION OF STAGE 3 CONSTRUCTION ACTIVITIES.
13. STOCKPILING OF CHANNEL SUBSTRATE, RIVERSTONE, GRANULAR AND FILL MATERIAL NOT PERMITTED WITHIN 5.0 M OF EXISTING CHANNEL THROUGHOUT DURATION OF CONSTRUCTION. STOCK PILES OF CONSTRUCTION MATERIAL TO BE APPROPRIATELY PROTECTED WITH TEMPORARY SEDIMENT AND EROSION CONTROL MEASURES. NO STOCKPILING PERMITTED WITHIN 5.0 M OF THE TOP OF BANK OF THE NEW CHANNEL.
14. CREEK DIVERSION, DEWATERING AND SEDIMENT AND EROSION CONTROL MEASURES TO BE MONITORED REGULARLY THROUGHOUT THE DURATION OF CONSTRUCTION.
15. DESIGNATED FUEL STORAGE AREA TO BE LOCATED A MINIMUM 30.0 M FROM EXISTING CHANNEL.
16. THE CONTRACTOR SHALL, PRIOR TO EXCAVATING CONTACT NIAGARA PENINSULA ENERGY INC. FOR ACTIVITY WITHIN 3 M OF THE OH ELECTRICAL INFRASTRUCTURE. ACCORDING TO THE MINISTRY OF LABOUR'S OCCUPATIONAL HEALTH AND SAFETY ACT AND THE ELECTRICAL SAFETY CODE, ONLY NIAGARA PENINSULA ENERGY INC. EMPLOYEES OR APPROVED CONTRACTORS CAN WORK IN PROXIMITY TO THESE LINES.
17. ALL SUBSTITUTIONS MUST BE APPROVED BY THE ENGINEER.
18. AN ENVIRONMENTAL MONITOR WILL ATTEND THE SITE TO INSPECT ALL NEW CONTROLS, AS WELL AS ON A REGULAR BASIS, OR FOLLOWING RAIN/SNOWMELT EVENTS TO MONITOR ALL WORKS, AND SPECIFIC WORKS RELATED EROSION AND SEDIMENT CONTROLS, RESTORATION, AND NEAR WATER WORKS. THE MONITOR WILL BE ONSITE TO PROVIDE ADVICE AND TO ENSURE THAT ACTIVITIES THAT COULD HAVE A NEGATIVE IMPACT TO THE NATURAL ENVIRONMENT ARE EFFECTIVELY MITIGATED AS CONSTRUCTION PROCEEDS. SHOULD CONCERNS ARISE ONSITE, THE ENVIRONMENTAL MONITOR WILL CONTACT THE DEFENSE CONSTRUCTION CANADA REPRESENTATIVE.
19. THE CONTRACTOR IS ULTIMATELY RESPONSIBLE FOR CONTROLLING THE SEDIMENT AND EROSION WITHIN THE CONSTRUCTION SITE FOR THE PERIOD OF CONSTRUCTION.
20. THE CONTRACTOR SHALL PREVENT WIND-BLOWN DUST OR DEBRIS FROM SITE.
21. THE ENGINEER MAY MAKE ANY NECESSARY PROVISION TO THE PROPOSED SEDIMENT CONTROL PLAN AS DEEMED NECESSARY.



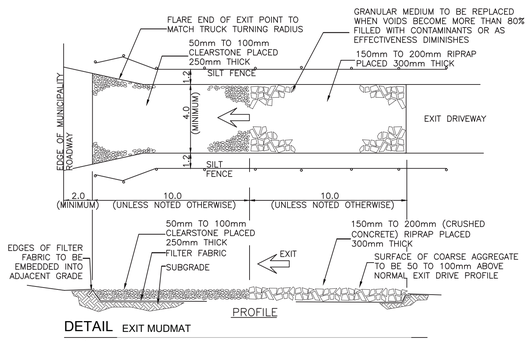
PLAN
HORIZONTAL SCALE 1:300
VERTICAL SCALE 1:300

SILT FENCE NOTES:

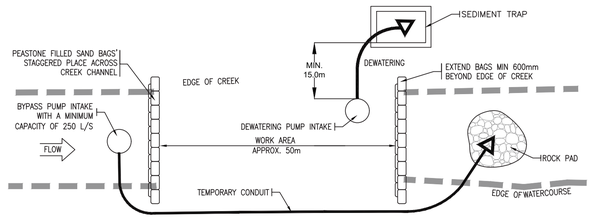
1. HEAVY DUTY SILT FENCE (OPSD 219.130) AROUND PROPOSED CHANNEL TO REMAIN UNTIL VEGETATION UNTIL VEGETATION HAS ESTABLISHED AROUND CHANNEL, AS APPROVED BY THE ENGINEER
2. HEAVY DUTY SILT FENCE (OPSD 219.130) AROUND EXISTING TRIB. 2A TO REMAIN UNTIL THE CHANNEL HAS BEEN FILLED



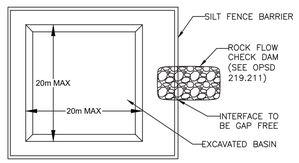
DETAIL COFFER DAM-OPSD 219.150
N.T.S.



DETAIL EXIT MUDMAT
N.T.S.



DETAIL CONSTRUCTION STAGING AND CREEK BYPASS
N.T.S.



DETAIL DEWATERING SEDIMENT TRAP-OPSD 219.240
N.T.S.

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- PROPOSE MAJOR CONTOUR (0.5m INTERVAL)
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- MH PROPOSED STM MH
- PROPOSED STM PIPE
- PROPOSED TOP OF BANK
- PROP. BOTTOM OF BANK
- PROPOSED BANKFULL
- PROPOSED RIFFLE ROCK
- PROPOSED CLAY PLUG
- CONSTRUCTION STAGE 1
- CONSTRUCTION STAGE 2
- CONSTRUCTION STAGE 3
- CONSTRUCTION STAGE 4
- CONSTRUCTION ACCESS ROUTE
- TEMPORARY STEEL MAT BRIDGE CROSSING
- HEAVY DUTY SILT FENCE
- CONSTRUCTION FENCE
- 30m WATERCOURSE SETBACK
- 5m NO-STOCKPILE ZONE
- TEMPORARY MUD MAT
- COFFER DAM
- BY-PASS FLOW INTAKE
- BY-PASS FLOW DISCHARGE

REFERENCE:

1 : 300 metres
6 0 6 12
HORIZONTAL

1 : 60 metres
1.2 0 1.2 2.4
VERTICAL

MATRIX SOLUTIONS INC.
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No.: 100187406
Professional Engineers Ontario

No.	DATE	REVISION	BY	CHK.	DRN.
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Matrix Solutions Inc.
ENVIRONMENT & ENGINEERING

URBANLINK
KONKLE CREEK TRIBUTARY 2A, 1B REALIGNMENT

TRIBUTARY 1B & 2A STAGING AND ENVIRONMENTAL PROTECTION PLAN

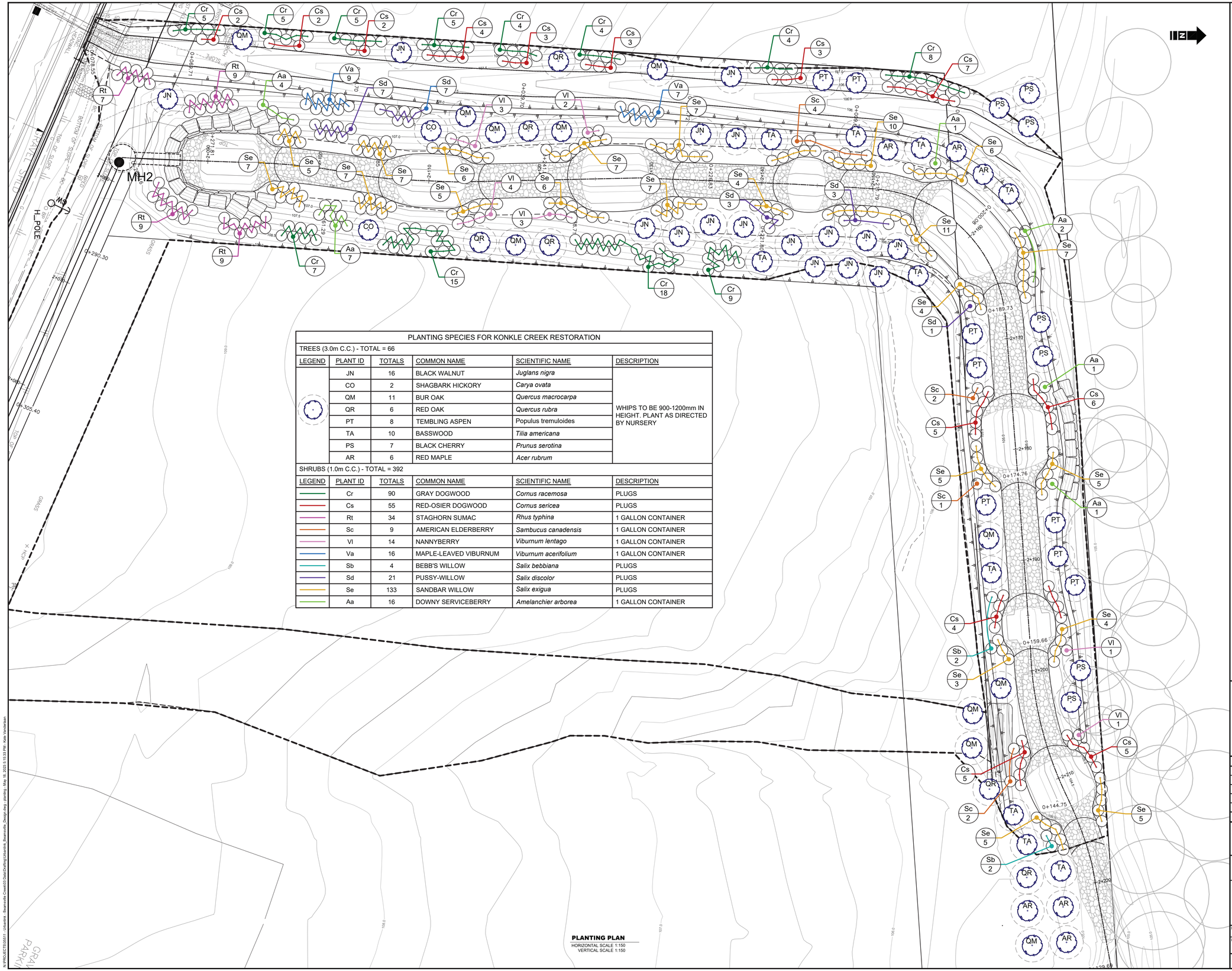
DATE:	TECHNICAL:	REVIEWER:	DRAWN:
MAY 2023	N. KRYGSMAN	M. PUSHKAR	K. VANDER

PROJECT: 35511-522 | REVISION: 3 | SHEET: 5

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PLANTING SPECIES FOR KONKLE CREEK RESTORATION

TREES (3.0m C.C.) - TOTAL = 66

LEGEND	PLANT ID	TOTALS	COMMON NAME	SCIENTIFIC NAME	DESCRIPTION
	JN	16	BLACK WALNUT	*Juglans nigra*	WHIPS TO BE 900-1200mm IN HEIGHT. PLANT AS DIRECTED BY NURSERY
	CO	2	SHAGBARK HICKORY	*Carya ovata*	
	QM	11	BUR OAK	*Quercus macrocarpa*	
	QR	6	RED OAK	*Quercus rubra*	
	PT	8	TEMBLING ASPEN	Populus tremuloides	
	TA	10	BASSWOOD	*Tilia americana*	
	PS	7	BLACK CHERRY	*Prunus serotina*	
	AR	6	RED MAPLE	*Acer rubrum*	

SHRUBS (1.0m C.C.) - TOTAL = 392

LEGEND	PLANT ID	TOTALS	COMMON NAME	SCIENTIFIC NAME	DESCRIPTION
	Cr	90	GRAY DOGWOOD	*Cornus racemosa*	PLUGS
	Cs	55	RED-OSIER DOGWOOD	*Cornus sericea*	PLUGS
	Rt	34	STAGHORN SUMAC	*Rhus typhina*	1 GALLON CONTAINER
	Sc	9	AMERICAN ELDERBERRY	*Sambucus canadensis*	1 GALLON CONTAINER
	Vl	14	NANNYBERRY	*Viburnum lentago*	1 GALLON CONTAINER
	Va	16	MAPLE-LEAVED VIBURNUM	*Viburnum acerifolium*	1 GALLON CONTAINER
	Sb	4	BEBB'S WILLOW	*Salix bebbiana*	PLUGS
	Sd	21	PUSSY-WILLOW	*Salix discolor*	PLUGS
	Se	133	SANDBAR WILLOW	*Salix exigua*	PLUGS
	Aa	16	DOWNY SERVICEBERRY	*Amelanchier arborea*	1 GALLON CONTAINER

PLANTING PLAN
HORIZONTAL SCALE 1:150
VERTICAL SCALE 1:150

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- PROPOSED STM MH
- PROPOSED STM PIPE
- PROPOSED TOP OF BANK
- PROP. BOTTOM OF BANK
- PROPOSED BANKFULL
- PROPOSED RIFFLE ROCK
- PROPOSED CLAY PLUG
- RURAL ONTARIO ROADSIDE NATIVE SEED MIX
- **INFERNO TURF TYPE TALL FESCUE LAWN SEED**
- PROPOSED DECIDUOUS TREE - 3.0m C.C.
- PROPOSED SHRUB - 1.0m C.C.

REFERENCE:

1 : 150 metres
3 0 3 6
PLAN

MATRIX SOLUTIONS INC.
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REVISION

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REVISION: 3
SHEET: 9

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