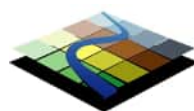


NATURAL ENVIRONMENT REPORT

Aggregate Resources Act Licence Amendment
Stanley Pit, Municipality of Middlesex Centre

17 July 2024



TERRASTORY
environmental consulting inc.

NATURAL ENVIRONMENT REPORT

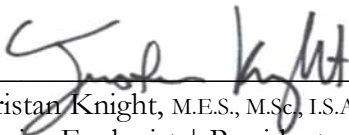
Aggregate Resources Act Licence Amendment
Stanley Pit, Municipality of Middlesex Centre

Prepared for:

McCann Redi-Mix Inc.
69478 Bronson Line
Dashwood, ON N0M 1N0

Prepared by:

Terrastory Environmental Consulting Inc.
171 Glen Road
Hamilton, ON L8S 3N2
905.745.5398



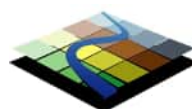
Tristan Knight, M.E.S., M.Sc., I.S.A., C.E.R.P.
Senior Ecologist | President



Rob Aitken, B.Sc.
Senior Ecologist | GIS Specialist

Project No.: 2098
17 July 2024

This report has been prepared by Terrastory Environmental Consulting Inc. (hereinafter "Terrastory") for the client. All information, conclusions, and recommendations contained in this report are subject to the scope and limitations set out in the agreement between Terrastory and the client and qualifications contained in this report. This report shall not be relied upon by any third parties without the prior written consent of Terrastory. Terrastory is not responsible for any injury, loss, or damages arising from improper use of this report by third parties. Excerpts of this report or alterations to this report taken without the authorization of Terrastory invalidates the report and any conclusions therein.



TERRASTORY
environmental consulting inc.

TABLE OF CONTENTS

1	INTRODUCTION.....	1
1.1	Study Background.....	1
1.2	Study Purpose.....	1
2	APPROACH AND METHODS	2
2.1	Background Biophysical Information Assessment.....	2
2.2	Site Assessments and Surveys.....	3
2.3	Significance Assessment.....	5
2.3.1	Definitions and Criteria.....	5
2.3.2	Determination.....	6
2.4	Effects Assessment and Mitigation.....	6
2.5	Natural Heritage Policy Context.....	7
3	EXISTING BIOPHYSICAL CONDITIONS	8
3.1	Land-use and Landscape Setting.....	8
3.2	Physical Setting.....	8
3.2.1	Surficial Geology and Groundwater Resources.....	8
3.2.2	Topography and Drainage, and Surface Water Features.....	9
3.2.3	Surface Water Features.....	9
3.3	Ecological Setting.....	9
3.3.1	Vegetation Communities.....	9
3.3.2	Vascular Plants.....	10
3.3.3	Breeding Bird Surveys.....	10
3.3.4	Fish.....	10
3.3.5	Incidental Wildlife.....	11
4	SIGNIFICANCE ASSESSMENT	11
4.1	Significant Woodlands.....	12
4.2	Significant Wildlife Habitat.....	12
4.3	Significant Areas of Natural and Scientific Interest.....	13
4.4	Habitat of Endangered and Threatened Species.....	13
4.5	Fish Habitat.....	13
5	PHASING, OPERATIONS, AND REHABILITATION PLANS	13
6	EFFECTS ASSESSMENT AND MITIGATION	14
6.1	Significant Wildlife Habitat.....	15
6.2	Provincially Significant Earth Science ANSI.....	16
6.3	Habitat of Endangered and Threatened Species.....	16

6.3.1	Bank Swallow.....	16
6.3.2	Bobolink	16
6.4	Fish Habitat.....	16
7	APPLICABLE NATURAL HERITAGE AND ENVIRONMENTAL POLICIES.....	19
7.1	<i>Aggregate Resources Act</i> , R.S. O. 1990, c. A.8	19
7.2	<i>Provincial Endangered Species Act</i> , S.O. 2007, c. 6	19
7.3	<i>Federal Migratory Birds Convention Act</i> , S.C. 1994, c. 22.....	20
8	CONCLUSIONS	20
9	REFERENCES	22

Figures

Figure 1.	Location of the Site.	23
Figure 2.	Biophysical Features and Conditions.....	24
Figure 3.	Significant Natural Features.....	25

Tables

Table 1.	Background Biophysical Information Acquired and Reviewed.	2
Table 2.	Site Assessments and Ecological Surveys performed within the Subject Property.....	4
Table 3.	Applicable Natural Heritage Policies.....	8
Table 4.	Summary of the Assessment of Significant Natural Features within the Site and Adjacent Lands.....	11

Appendices

Appendix 1.	Curriculum Vitae
Appendix 2.	Representative Photographs
Appendix 3.	Vascular Plant List
Appendix 4.	Breeding Bird Survey Results
Appendix 5.	Results of UTRCA Electrofishing Survey
Appendix 6.	Significant Wildlife Habitat Assessment
Appendix 7.	Endangered and Threatened Species Assessment
Appendix 8.	Site Plans
Appendix 9.	Stanley Pit Natural Channel Design
Appendix 10.	DFO Letter of Advice

1 INTRODUCTION

1.1 Study Background

Terrastory Environmental Consulting Inc. (hereinafter “Terrastory”) was retained by McCann Redi-Mix Inc. (hereinafter “the Applicant”) to prepare this Natural Environment Report (NER) in support of a Major Site Plan Amendment application pursuant to the *Aggregate Resources Act* (ARA) in the Municipality of Middlesex Centre. The proposed amendment to the existing aggregate licence (No. 2191) seeks to reconfigure portions of the extraction area by way of realigning a section of Medway Creek. The extraction area is referred to herein as the “Stanley Pit”. Stanley Pit is situated at 14693 Fifteen Mile Road within the northern half of Lot 13, Concession 14, in the former Geographic Township of London. Most of the existing licenced area has been extracted or disturbed.

The following terminology is employed throughout this NER to describe certain noteworthy areas and features which are shown spatially on **Figure 1**:

- **Subject Property** – parcels/properties in which the aggregate licence is situated.
- **Site** – area comprising the portion of the existing extraction area to be amended.
- **Adjacent Lands** – areas within 120 meters of the Site.
- **Study Area** – Site and Adjacent Lands collectively.

The location of the Subject Property, Site, and Adjacent Lands within their broader landscape setting is shown in **Figure 1**.

1.2 Study Purpose

This NER has been prepared to address the requirements of the ARA and its associated regulation (O. Reg. 244/97) and policy standards. ARA licence applications must be made in accordance with the Provincial Standards (i.e., *Aggregate Resources of Ontario Standards: A compilation of the four standards adopted by Ontario Regulation 244/97 under the Aggregate Resources Act*) per subsection 0.2(2) of O. Reg. 244/97. Section 2.2 of the compiled Aggregate Resources of Ontario Standards triggers the need for an NER in support of ARA applications involving Class A (removal of more than 20,000 tonnes of aggregate annually) or Class B (removal of less than 20,000 tonnes of aggregate annually) licences. The NER must identify the following natural heritage features and areas existing on the Site and within 120 m of the Site:

- a) Significant wetlands;
- b) Other coastal wetlands in Ecoregions 5E, 6E and 7E;
- c) Fish habitat;
- d) Significant woodlands and significant valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Mary’s River);
- e) Habitat of endangered species and threatened species;
- f) Significant wildlife habitat;
- g) Significant areas of natural and scientific interest; and
- h) Within the area of one or more provincial plan(s), any key natural heritage features not included in (a) through (g).

“Site” is defined per subsection 1(1) of the ARA as “the land or land under water to which a licence or permit or an application therefor relates”. The compiled Standards further clarify scoping of the NER (p. 28/29) as follows:

Where any of the above features or areas have been identified, the report must identify and evaluate any negative impacts on the natural features or areas, including their ecological functions, and identify any proposed preventative, mitigative or remedial measures. The report must also identify if the site or any of the features, included in (a) through (g), are located within a natural heritage system that has been identified by a municipality in ecoregions 6E and 7E or by the province as part of a provincial plan.

This NER further considers and assesses the consistency of the licence application with other applicable natural heritage legislation including the provincial *Endangered Species Act* and federal *Fisheries Act*.

2 APPROACH AND METHODS

This study is composed of five (5) discrete components which are bulleted below and further described in the following sections.

- **Acquire background biophysical information and mapping** available for the Study Area and local landscape (see **Section 2.1**).
- **Conduct site assessments and ecological surveys** to verify the accuracy of the acquired background biophysical information and collect additional biophysical information as necessary (see **Section 2.2**).
- **Assess the significance** of the biophysical information collected and natural features identified within the context of applicable natural heritage and environmental policies (see **Section 2.3**).
- **Predict the effects** of the application on the identified significant natural features and natural environment, particularly the net effects once mitigation measures and technical recommendations are implemented (see **Section 2.4**).
- **Determine whether the proposed application addresses applicable natural heritage and environmental policies** at municipal, provincial, and federal levels (see **Section 2.5**).

Curriculum vitae for the report authors (T. Knight, Senior Ecologist/President, and R. Aitken, Senior Ecologist/GIS Specialist) are provided in **Appendix 1**.

2.1 Background Biophysical Information Assessment

This study is supported by background biophysical information and mapping acquired and reviewed from a variety of sources which are listed below in **Table 1**.

Table 1. Background Biophysical Information Acquired and Reviewed.

Type of Information Acquired	Description
Ortho-rectified Aerial Photographs	• 1954, 2006, 2009, 2013, 2015-2018, 2020.

Type of Information Acquired	Description
Natural Feature Mapping	<ul style="list-style-type: none"> • Municipality of Middlesex Centre Official Plan (December 2023) including Schedule B (Greenlands System), Schedule C (Natural Hazard Lands), and Schedule F (Sourcewater Protection Areas). • County of Middlesex Official Plan (July 7, 2023) including Schedule C (Natural Heritage System), Schedule D (Natural Hazard Areas), Schedule E (Aggregate Resources), and Schedule F (Source Water Protection). • Land Information Ontario (LIO) accessed via MNRF’s “Make a Map” web-based platform (last accessed 7 February 2024). • Upper Thames River Conservation Authority (UTRCA) regulation mapping (last accessed 7 February 2024).
Physiographic Resource Mapping and Datasets	<ul style="list-style-type: none"> • Provincial Digital Elevation Model. • Ontario Well Records (publicly-available). • The Soils of Middlesex County (Hagerty and Kingston 1992). • Agricultural Information Atlas (accessed 7 February 2024). • Surficial Geology of Southern Ontario (Ontario Geological Survey 2010). • Physiography of Southern Ontario (Chapman and Putnam 1984).
Ecological Resource Mapping and Datasets	<ul style="list-style-type: none"> • Natural Heritage Information Centre (NHIC) database accessed via MNRF’s “Make a Map” web-based platform (squares: 17MH7477, 17MH7577, 17MH7278, 17MH7478 and 17MH7578; accessed 7 February 2024). • iNaturalist “(NHIC) Rare species of Ontario” project (accessed 7 February 2024). • iNaturalist “Herps of Ontario” project (accessed 7 February 2024). • Ontario Reptile & Amphibian Atlas (square: 17MH84; accessed 7 February 2024). • Ontario Breeding Bird Atlas (OBBA) database and the Atlas of the Breeding Birds of Ontario, 2001–2005 (Cadman et al. 2007) (square: 17MH84) • Ontario Butterfly Atlas database (square: 17MH84; accessed 7 February 2024). • Aquatic Species at Risk Maps by Fisheries and Oceans Canada (accessed 7 February 2024). • Critical Habitat for Species at Risk National Dataset by Government of Canada (accessed 7 February 2024). • Atlas of the Mammals of Ontario (Dobbyn 2005).
Natural Heritage Objectives and Strategies	<ul style="list-style-type: none"> • Medway Creek 2022 Watershed Report Card (UTRCA 2022).

2.2 Site Assessments and Surveys

The acquired background information per **Table 1** helped direct several site assessments and surveys carried out by Terrastory staff. **Table 2** below indicates the primary assessments/surveys performed during each site visit, weather conditions, and time on-site.

Table 2. Site Assessments and Ecological Surveys performed within the Subject Property.

Date	Assessments/Surveys Performed	Terrastory Staff	Weather Conditions	Time On-site
23 October 2020	Site reconnaissance, aquatic habitat assessment; incidental observations.	T. Knight	Air temperature 22°C; Approximate Wind Speed: 12-19 km/h; Cloud Cover: 75 to 100%; No precipitation.	12:30 – 17:30
22 October 2021	Vascular plant survey; incidental observations.	R. Aitken	Air temperature 6°C; Approximate Wind Speed: 6-11 km/h; Cloud Cover: 75 to 100%; No precipitation.	11:30 – 14:30
09 June 2022	Vascular plant survey; vegetation community mapping (Ecological Land Classification ELC); breeding bird survey #1; incidental observations.	R. Aitken	Air temperature 12-14°C; Approximate Wind Speed: 12-19 km/h; Cloud Cover: 75 to 100%; No precipitation.	8:00 – 10:30
27 June 2022	Vascular plant survey; vegetation community mapping (Ecological Land Classification ELC); breeding bird survey #2; incidental observations.	R. Aitken	Air temperature 16-24°C; Approximate Wind Speed: 6-11 km/h; Cloud Cover : 0 to 50%; No precipitation.	7:45 – 9:30
08 July 2022	Vascular plant survey, breeding bird survey #3, incidental observations.	R. Aitken	Air temperature 15-17°C; Approximate Wind Speed: 0-2 km/h; Cloud Cover: 25 to 50%; No precipitation.	6:45 – 8:15
09 Sept. 2022	Vascular plant survey; vegetation community mapping (Ecological Land Classification ELC); incidental observations.	R. Aitken	Air temperature 15-17°C; Approximate Wind Speed: 0-2 km/h; Cloud Cover: 75 to 100%; No precipitation.	8:00 – 10:30

The site assessments and surveys centred on characterizing the land use (e.g., historical development patterns, existing built features, land maintenance, etc.), physiographic (e.g., topography, drainage, surface water features, etc.), and ecological (e.g., vegetation, wildlife, habitats, etc.) conditions and features of the Study Area. All land-use, physiographic, and ecological information described for Adjacent Lands was collected from either current aerial photographs or observations from inside the Subject Property and/or publicly accessible areas (e.g., rights-of-way, roadsides, etc.). The locations and boundaries of significant natural features and/or habitats were recorded on-site with a GPS supported by representative photographs.

In addition to collecting general biophysical information, the following targeted assessments (i.e., feature- or species-specific surveys) were undertaken:

- **Vegetation Mapping according to Ecological Land Classification (ELC):** Vegetation communities on the Subject Property were characterized and mapped according to Ecological Land Classification (Lee et al. 1998)(Lee et al. 1998)(Lee et al. 1998)(Lee et al. 1998)(Lee et al. 1998)(Lee et al.

1998)(Lee et al. 1998)(Lee et al. 1998) and the 2008 update to the Vegetation Type List (Lee 2008)(Lee 2008)(Lee 2008)(Lee 2008)(Lee 2008)(Lee 2008)(Lee 2008)(Lee 2008). Vegetation communities were initially identified based on current aerial photographs and then verified and refined (as necessary) on-site. ELC mapping was scaled to the finest level of resolution deemed appropriate (i.e., either Ecosite or Vegetation Type). Vegetation communities mapped on Adjacent Lands were delineated predominantly via aerial photograph interpretation.

- **Vascular Plant Survey:** Vascular plants were recorded based on a comprehensive area search (“wandering transects”) within naturally occurring (i.e., non-planted) or naturalizing areas of vegetation. Effort was paid to areas with the greatest potential to support significant vascular plants (i.e., designated Species at Risk, provincially rare, etc.) and areas with the greatest potential for impact based on the proposed development plan. Nomenclature and common names for the recorded vascular plant species are generally consistent with the Southern Ontario Vascular Plant Species List (Bradley 2013)(Bradley 2013)(Bradley 2013)(Bradley 2013)(Bradley 2013)(Bradley 2013)(Bradley 2013)(Bradley 2013) except where a name change has more recently been adopted by NHIC.
- **Breeding Bird Surveys according to the Ontario Breeding Bird Atlas Protocol:** Three (3) rounds of breeding bird surveys were conducted in accordance with the Ontario Breeding Bird Atlas (OBBA) protocol (Bird Studies Canada et al. 2001) and Survey Methodology under the Endangered Species Act, 2007: *Dolichonyx oryzivorus* (Bobolink) (Ontario Ministry of Natural Resources 2011). Surveys occurred within the appropriate season (May 24–July 10), time of day (between dawn and approximately 5 hours after dawn), and weather conditions (no rain, wind speed ≤ 3 on the Beaufort Wind Scale). While these protocols recommend that stations be situated at least 250 to 300 m apart (to avoid double counting), the stations established herein were often closer together to ensure more comprehensive survey coverage. Surveys occurred for a minimum duration of 10 minutes at each station. Individuals detected while travelling between stations were also recorded.
- **Ontario Stream Assessment Protocol (OSAP):** Fish and aquatic habitat conditions within all on-site surface water features were assessed in accordance with the Ontario Stream Assessment Protocol (OSAP) (Stanfield 2010). A modified-version of the OSAP Section 4, Module 1 (Rapid Assessment Methodology for Channel Structure) was employed to collect the aquatic data. OSAP provides a standard assessment technique for characterizing watercourses and their attendant fish and aquatic habitat conditions at specific locations (stations). Information to collect includes bankfull and wetted widths, channel structure, evidence of erosion, instream cover, substrate type, stability, and aquatic and riparian vegetation, and other relevant characteristics.

2.3 Significance Assessment

2.3.1 Definitions and Criteria

“Significant natural features” as described herein represent natural features and habitats that have recognized status (and therefore policy significance) within the planning jurisdiction in which an application is proposed. Significant natural features are defined herein to include those outlined in the compiled Aggregate Resources of Ontario Standards, namely:

- a) Significant wetlands;
- b) Other coastal wetlands in Ecoregions 5E, 6E and 7E;
- c) Fish habitat;
- d) Significant woodlands and significant valleylands in Ecoregions 6E and 7E (excluding islands in Lake Huron and the St. Mary’s River);

- e) Habitat of endangered species and threatened species;
- f) Significant wildlife habitat;
- g) Significant areas of natural and scientific interest; and
- h) Within the area of one or more provincial plan(s), any key natural heritage features not included in (a) through (g).

Criteria used to determine the presence or absence of the above significant natural features within the Study Area were considered from a variety of sources including the Natural Heritage Reference Manual (MNR 2010) and (for Significant Wildlife Habitat) the Ecoregion 6E Criteria Schedule (MNRF 2015).

Like significant natural features, “significant species” represent individuals of wild species which have recognized status (and therefore policy significance) within the planning jurisdiction in which an application is proposed. Significant species are defined herein to include:

- Species designated Endangered, Threatened, or Special Concern under O. Reg. 230/08 pursuant to the provincial *Endangered Species Act, 2007*.
- Species designated Provincially Rare (i.e., S1, S2, or S3) by NHIC.
- Species considered Regionally Rare in Middlesex County pursuant to the *List of the Vascular Plants of Ontario’s Carolinian Zone* (Oldham 2017).

2.3.2 Determination

After collecting the background biophysical information and conducting the site assessments the data was interpreted to determine whether any significant natural features and/or significant species occur within the Study Area. If a natural feature or species met the significance criteria, it is considered “confirmed”. If a natural feature or species may be present within the Study Area given the prevailing biophysical or habitat conditions but was not confirmed based on either background or site-specific biophysical data, it is considered potential or “candidate”. Candidate significant natural features and species are treated as confirmed where no additional information is available.

2.4 Effects Assessment and Mitigation

The potential ecological effects of an application can be understood spatially as zones that radiate outward from the direct project footprint (building envelope, etc.) and associated areas of site alteration (grading, etc.). While the greatest potential for effects typically occurs within areas directly subject to development or disturbance, surrounding areas may also be affected indirectly. Such indirect effects can include light or noise pollution that affects wildlife communities on Adjacent Lands, or degradation of water quality within a downstream receptor resulting from sediment runoff during extraction.

The following five-pronged approach is employed herein to assess the effects of an application on significant natural features and species and (where warranted) the natural environment in general:

1. **Scope** the effects assessment to environmental components that warrant consideration. The effects assessment herein centres principally on significant natural features and species (i.e., those that have policy significance within the planning jurisdiction, as defined in **Section 2.3**) but may also consider general environmental effects where warranted.

2. **Identify the predicted direct and indirect effects** of the application on each significant natural feature or species during all project stages (i.e., pre- to -post-development) in the absence of mitigation. Direct effects are those where there is a cause-effect relationship between a proposed activity and an effect on a natural feature or species (e.g., tree clearance within a building footprint, etc.). Indirect effects result when an activity is linked to a direct effect through a chain of foreseeable interactions or steps.
3. **Evaluate the significance** of the predicted effects for each environmental component based on their attributes (i.e., spatial extent, magnitude, timing, frequency, and duration) and likelihood (i.e., high, medium, low).
4. Where the potential for negative effects are anticipated, **recommend ecologically meaningful mitigation measures** to avoid such impacts first (where possible), and where impacts cannot be avoided to minimize, compensate, and/or enhance as appropriate.
5. **Identify the predicted residual or net effects** of the application assuming implementation of all recommended mitigation measures.

Per step 4, mitigation measures are offered where the potential for negative effects are anticipated to a degree that cannot be supported given the prevailing policy context. Whenever possible, Terrastory works iteratively with the project team to identify extraction options that avoid negative effects first; options that would minimize or mitigate such negative effects are less preferred and considered secondarily. In general, avoidance measures that have already been incorporated into the application or project design are not duplicated as technical recommendations herein. The Site Plans (phasing, operations, and rehabilitation) are described in **Section 5** while the effects assessment and recommended mitigation measures are provided in **Section 6**.

2.5 Natural Heritage Policy Context

There is an overlapping municipal, provincial, and federal policy framework respecting the protection of natural heritage features and areas across southern Ontario. These requirements include objectives, policies, and directives which are principally contained in federal and provincial statutes, regulations, policy statements, Official Plans, and guidance documents. The overarching natural heritage policy framework directing development activities within the Subject Property is outlined below in **Table 3**. A determination of whether the applications considered herein address such policies is provided in **Section 6.4**.

The regulatory jurisdiction of Upper Thames River Conservation Authority (UTRCA) is not strictly applicable to applications made under the *Aggregate Resources Act* per Subsection 28(2) of the *Conservation Authorities Act*. UTRCA may be circulated the licence amendment by MNRF for comment on matters related to natural hazards.

As the Site is already designated and zoned for extractive uses, no planning approvals are required to facilitate the licence amendment. As a result, there are no governing municipal (e.g., Municipality of Middlesex Centre Official Plan, Middlesex County Official Plan) and/or provincial (e.g., Provincial Policy Statement) land-use planning policies pertaining to the natural environment which are applicable to this aggregate licence amendment.

Table 3. Applicable Natural Heritage Policies.

Level of Government	Natural Heritage or Environmental Policy Requirements
Provincial	<p><i>Aggregate Resources Act</i> (ARA), R.S.O. 1990, c. A.8, including:</p> <ul style="list-style-type: none"> • Ontario Regulation 244/97 – General • Aggregate Resources of Ontario Standards <p><i>Endangered Species Act</i> (ESA), S.O. 2007, c. 6, including:</p> <ul style="list-style-type: none"> • Ontario Regulation 230/08 – Species at Risk in Ontario List • Ontario Regulation 242/08 – General • Ontario Regulation 832/21 – Habitat <p><i>Fish and Wildlife Conservation Act</i>, S.O. 1997, c. 41.</p>
Federal	<p><i>Fisheries Act</i>, R.S.C. 1985, c. F-14, including:</p> <ul style="list-style-type: none"> • Fish and Fish Habitat Protection Policy Statement (DFO 2019). <p><i>Migratory Birds Convention Act</i>, S.C. 1994, c. 22, including:</p> <ul style="list-style-type: none"> • Migratory Birds Regulations, C.R.C., c. 1035.

3 EXISTING BIOPHYSICAL CONDITIONS

The following is a description of the biophysical features and conditions of the Site, which are shown spatially on **Figure 2**. Representative photographs are provided in **Appendix 2**.

3.1 Land-use and Landscape Setting

The Site is situated in a rural landscape north of London. Nearby parcels contain a mixture of croplands and natural areas, with former and active aggregate pits present to the north of the Subject Property.

3.2 Physical Setting

3.2.1 Surficial Geology and Groundwater Resources

The Site lies within an alluvial spillway and outwash that is surrounded by glacial deposits within the Stratford Till Plain (Chapman and Putnam 1984). Detailed descriptions of the geology and hydrology of the Study Area and subsurface conditions of the Site are described within the Stanley Pit Hydrogeological Assessment prepared by Novaterra (2024) as part of the Major Site Plan amendment application.

Through their hydrogeological assessment, Novaterra (2024) demonstrated that the relationship between groundwater and Medway Creek within the Site can be separated into three distinct stages which they identify as effluent conditions, no-flow in the creek, and influent conditions. While Medway Creek can be dry for short periods (typically in the late summer or early fall), groundwater hydraulic gradients typically flow towards Medway Creek and baseflow from groundwater feeds Medway Creek throughout most of the year.

3.2.2 Topography and Drainage, and Surface Water Features

The Site is situated within the Medway Creek valley. The topographic high of the Site, which is generally associated with the eastern valley top of slope, is approximately 299 meters above sea level (masl). The topographic low of the Site, which is associated with Medway Creek near the southern limit of the Site, is approximately 289 masl. The agricultural fields and meadows east of Medway Creek are characterized by gently rolling hills that shed overland runoff in a westward direction towards Medway Creek. The lands west of Medway Creek are comprised of open-water ponds created by aggregate extraction. Topographic contours (LiDAR-derived) are shown on **Figure 2**.

3.2.3 Surface Water Features

The reaches of Medway Creek within the Study Area extend approximately 720 m (Euclidian Distance) in length. The bed material is coarse consisting primarily of gravel and cobble-sized substrates (approaching 100% of the substrate in the central and northern reaches), with sand and fines (silt/clay) restricted to the southern reaches. The bankfull channel width is generally about 5 m, though is much narrower (< 3 m) in certain central reaches and wider (approaching 12 m) in certain downstream reaches.

Medway Creek has limited interaction with the floodplain as the watercourse is entrenched in certain areas. Vegetation along the immediate edges of the channel banks consists primarily of Reed-canary Grass (*Phalaris arundinacea*) with occasional Giant Ragweed (*Ambrosia trifida*), Panicked Aster (*Symphotrichum lanceolatum*), Blue Vervain (*Verbena hastata*), Witch's Grass (*Panicum capillare*), Sandbar Willow (*Salix interior*), and Silky Dogwood (*Cornus obliqua*). Aquatic vegetation is negligible through much of the Study Area, which reflects the intermittent flow regime (the watercourse was largely dry during the aquatic habitat assessment on 10 October 2020).

3.3 Ecological Setting

3.3.1 Vegetation Communities

The largest vegetation community within the Study Area by spatial extent is the Dry – Fresh Graminoid Meadow (MEGM3). This vegetation community borders both sides of Medway Creek extending from the edge of the extraction areas west of Medway Creek to the agricultural fields east of Medway Creek. This vegetation community is dominated by a mixture of grasses and forbs including Red Fescue (*Festuca rubra*), Smooth Brome (*Bromus inermis*), Orchard Grass (*Dactylis glomerata*), Common Crown-vetch (*Securigera varia*), and Tall Goldenrod (*Solidago altissima* var. *altissima*). Small groupings of shrubs mostly comprised of Silky Dogwood and Common Buckthorn (*Rhamnus cathartica*) were also present throughout the vegetation community.

At the southern edge of the Study Area, south of the Site and Subject Property, is a small Fresh – Moist Manitoba Maple Deciduous Woodland (WODM5) that borders the east and west banks of Medway Creek.

Other features identified within the Study Area include:

- Open Water (OAW), which is associated with ponds located within the existing extracted area,
- Exposed aggregates, which are also associated with areas undergoing extraction, and
- Agricultural fields that were planted in row crops during 2022.

3.3.2 Vascular Plants

A total of 91 vascular plant species were recorded within the Subject Property (see **Appendix 3**). Of these, approximately 46 (51%) are considered native to Ontario and 45 (49%) are considered exotic.

No provincially rare species with subnational ranks of S1, S2, or S3 or regionally rare species pursuant to the *List of the Vascular Plants of Ontario's Carolinian Zone* (Oldham 2017) were documented within the Study Area.

3.3.3 Breeding Bird Surveys

Breeding bird surveys were conducted at three (3) stations on 09 June, 27 June, and 8 July 2022. A total of twenty-three (23) bird species were detected. A full list of species is provided in **Appendix 4**. Based on the breeding evidence thresholds provided in the OBBA protocol (Bird Studies Canada et al. 2001), this included:

- Two (2) species that were considered “Confirmed” breeders, either by observations of recently fledged young or observations of nests with eggs (NE).
- Four (4) native species and one (1) non-native species that were considered “Probable” breeders either by observed agitated behavior (A), observation of a pair in suitable nesting habitat (P), or presumed territory (T).
- Seven (7) native species and one (1) non-native species that were considered “Possible” breeders either by evidenced by documentation of a singing male (S) observed in suitable habitat during the breeding season (H). These species were birds that had only been observed during one of the two breeding bird surveys.
- Eight (8) native species that were considered “Observed” or as “Flyovers or Foraging” due to lack of any breeding evidence or suitable nesting habitat within the Study Area.

The following Species at Risk (SAR) were detected during the 2022 breeding bird surveys:

- Barn Swallow (*Hirundo rustica*) – Special Concern
- Bank Swallow (*Riparia riparia*) – Threatened
- Bobolink (*Dolichonyx oryzivorus*) – Threatened

These species are discussed further in **Section 4.4**.

3.3.4 Fish

Medway Creek is considered by the MNRF to exhibit a coldwater thermal regime according to the Aquatic Resource Area classification (AY-0003-MED), though the observed fish community and presence of large online ponds upstream of the Study Area suggests that the system may be better described as a cool/warmwater system.

An electrofishing survey was performed on 25 August 2020 by UTRCA. The survey commenced at the southern edge of the Subject Property and proceeded northward (upstream) for approximately 130 m, at which point the watercourse became dry and remained so until the upstream limit of the proposed watercourse realignment. A total of 18 fish species were captured (576 total), as summarized in **Appendix 5**. Several species which occupy larger/wider waterbodies (e.g., Common Carp [*Cyprinus carpio*], Yellow Perch [*Perca flavescens*]) were captured, which reflects the presence of

large online ponds north of Fifteen Mile Road. Young of the year Largemouth Bass (*Micropterus salmoides*), White Sucker (*Catostomus commersonii*), and Black Bullhead (*Ameiurus vulgaris*) were also captured, though it is unknown if capture areas of young of the year fish reflected the presence of nursery habitat, or rather areas where fish had congregated (and became isolated) due to low water levels.

A mussel survey was performed on 12 August 2020 by UTRCA under suitable conditions. While no live mussels were documented, many intact (and recently deceased) mussel shells were observed, all of which were identified as Giant Floater (*Pyganodon grandis*; identification was confirmed by the DFO at that time). Terrastory also performed a site assessment on 10 October 2020, wherein the watercourse was found to be largely dry and several deceased Giant Floater shells were documented.

Current DFO Aquatic SAR mapping indicates a lack of SAR mussels present within the Study Area, and presence of Northern Sunfish which is designated Special Concern per Schedule 1, Part 4 of the *Species at Risk Act* (SARA). Northern Sunfish (*Lepomis peltastes*) was not documented during the 25 August 2020 electrofishing survey.

3.3.5 Incidental Wildlife

A variety of wildlife species were recorded incidentally during the fieldwork program. This includes:

- One (1) **anuran** species (recorded within the watercourse outside the formal anuran calling survey period): Green Frog (*Lithobates clamitans*).
- Five (5) **mammal** species (including signs of mammals): Coyote (*Canis latrans*), Eastern Cottontail (*Sylvilagus floridanus*), Muskrat (*Ondatra zibethicus*), Mink (*Mustela vison*), and White-tailed Deer (*Odocoileus virginianus*).
- One (1) **aquatic crayfish** species (Cambaridae) recorded within the watercourse.
- Three (3) **butterfly** species: Cabbage White (*Pieris rapae*), Great Spangled Fritillary (*Speyeria Cybele*) and Monarch (*Danaus plexippus*).

4 SIGNIFICANCE ASSESSMENT

Based on the biophysical information collected during background information gathering (per **Table 1**) and the results of the site assessments and surveys (per **Sections 2.2** and **3**), **Table 4** below provides a determination of the presence (or potential presence) of each significant natural feature considered herein. Shaded rows denote features which were confirmed or may be present within the Site or Adjacent Lands and are considered further as part of the effects assessment in **Section 5**. Significant natural feature mapping is provided in **Figure 3**. Features that were not identified within the Site or Adjacent Lands are not considered further herein unless further discussion is warranted.

Table 4. Summary of the Assessment of Significant Natural Features within the Site and Adjacent Lands.

Significant Natural Feature	Status within the Site	Status on Adjacent Lands (i.e., < 120 m from the Site)
Significant Natural Features per ARA Provincial Standards		
Significant Wetlands	Absent.	Absent.
Significant Woodlands	Absent. See Section 4.1.	Absent. See Section 4.1.

Significant Natural Feature	Status within the Site	Status on Adjacent Lands (i.e., < 120 m from the Site)
Significant Valleylands	Absent.	Absent.
Significant Wildlife Habitat	Candidate. See Section 4.2.	Candidate. See Section 4.2.
Significant Areas of Natural and Scientific Interest	Absent.	Confirmed. See Section 4.3
Habitat of Endangered and Threatened Species (per ESA)	Absent. See Section 4.3.	Absent. See Section 4.3.
Fish Habitat (per <i>Fisheries Act</i>)	Confirmed. See Section 4.5.	Confirmed. See Section 4.5.

4.1 Significant Woodlands

Relevant ARA standards do not provide criteria and/or direction to assist with determining the presence or absence of “Significant Woodlands” through the aggregate licensing process. “Schedule B – Greenlands System” from the Municipality’s OP does not identify the woodlands south of the Site as Significant Woodlands. Given that the woodland south of the Site is not considered “significant” by the Municipality, no further assessment is warranted.

4.2 Significant Wildlife Habitat

An assessment of the likelihood that any candidate or confirmed SWH types or areas occur within or adjacent to the Site is provided in **Appendix 7**. Based on the results of this assessment, one (1) SWH type is considered further through this study:

- Habitat of Species of Conservation Concern
 1. Special Concern and Rare Wildlife Species (candidate)

A total of four (4) Special Concern or provincially rare species are considered to have a possible likelihood of occurrence on the Site given their habitat associations and current distribution in southern Ontario (or were confirmed during the fieldwork program):

- 1) American Bumble Bee (*Bombus pensylvanicus*)
- 2) Monarch (*Danaus plexippus*)
- 3) Yellow Banded Bumble Bee (*Bombus terricola*)
- 4) Snapping Turtle (*Chelydra serpentina*)

Each of these species is designated Special Concern in Ontario per O. Reg. 230/08 under the ESA. American Bumble Bee, Monarch, and Yellow Banded Bumble Bee are all also considered habitat generalists that can occupy a wide variety of areas and habitats throughout the various stages of their life cycles. Snapping Turtle was not observed during this study but may occupy the aggregate ponds as habitat. This species may also use Medway Creek as a corridor to migrate between other suitable habitats on the landscape.

It is recognized that Northern Sunfish habitat is mapped by DFO from the stretch of Medway Creek flowing through the Site; however, this species was not captured during the electrofishing survey by UTRCA in 2020.

An assessment of potential effects to the candidate SWH features and Special Concern species associated with the proposed pit operations plan is provided in **Section 6.1**.

4.3 Significant Areas of Natural and Scientific Interest

The Provincially Significant Elginfield Area Earth Science Area of Natural and Scientific Interest (ANSI) extends into the northwestern edge of the Study Area, including the existing licensed area.

4.4 Habitat of Endangered and Threatened Species

An assessment of the likelihood that any Endangered and Threatened species or their habitats occur within the Subject Property or Adjacent Lands is provided in **Appendix 7**. Through surveys that were completed as part of this study, two Threatened species were documented flying or foraging on or over the Study Area: (1) Bank Swallow, and (2) Bobolink.

Bank Swallow and Barn Swallow were detected flying and foraging over the Study Area. No suitable breeding habitat for either of these species was identified within the Study Area.

A group of approximately ten (10) Bobolink were recorded during the third breeding bird survey on 8 July 2022. As this species was not detected during the first or second survey and were not displaying typical breeding behaviour (e.g. territorial calls, agitated behaviour, etc.), they are believed to have utilized the habitat on the Site as a temporary refuge for foraging and resting and not as a breeding habitat. Groups of Bobolink are particularly known to move through the landscape and will routinely occupy smaller meadows and other habitat types which are unsuitable for breeding following haying activities which often occur in June and July.

No other Endangered or Threatened species or their habitat were identified within the Study Area through this assessment. Based on this, no habitat for Endangered or Threatened species are considered to be present within the Study Area.

4.5 Fish Habitat

A variety of fish species were recorded within Medway Creek during fish community surveys completed as part of this study, confirming the presence of direct fish habitat (see Section 3.3.4). An assessment of potential effects to fish habitat associated with the proposed pit operations plan is provided in **Section 6.4**.

5 PHASING, OPERATIONS, AND REHABILITATION PLANS

The Applicant is submitting a Major Site Plan Amendment to alter the areas of extraction. The proposed ARA site plans are provided in **Appendix 8**. The total area to be licensed, extracted, and rehabilitated is as follows:

- Total area to be licensed: 40.5 ha
- Total area to be extracted: 28.7 ha
- Previously disturbed area: 4.0 ha

Medway Creek flows in a southward direction along the existing southeastern limit of extraction and contains a 30 m setback on either side as part of the existing, approved aggregate licence. The

purpose of the Major Site Plan Amendment is to realign Medway Creek as a means to facilitate more efficient use of the aggregate resource available within Area IV.

6 EFFECTS ASSESSMENT AND MITIGATION

The purpose of this NER is to present a biophysical characterization of the Study Area to identify the potential for adverse effects on the natural environment and natural heritage features stemming from the proposed pit extraction activities. Several significant natural features and species were documented (or may occur) within the Site pursuant to the assessments in **Section 4**. The following effects assessment provides an evaluation of the potential for the proposed pit operations to result in negative effects to such environmental components and offers technical recommendations to mitigate such effects where warranted. Certain technical recommendations offered herein apply to several natural features and/or species simultaneously; as such, all technical recommendations should be read and considered in their entirety. The baseline or existing conditions against which the application is assessed are treated as the state of the Site at the time of the site assessments. The effects assessment herein is based on the Site Plans provided in **Appendix 8**.

All pits and quarries in Ontario are subject to a set of standards and conditions which are outlined in both O. Reg. 244/97 and the Site Plan Standards (August 2020) per the compiled Aggregate Resources of Ontario Standards. The effects assessment herein assumes that all pit operations within the Site will be undertaken consistent with these requirements, which pertain to both Class A and Class B licences. Such conditions and standards that have bearing on protection of the natural environment are not duplicated as technical recommendations herein as they already represent licence requirements. Relevant standards per subsections 0.12 and 0.13 of O. Reg. 244/97 include the following:

- Dust will be mitigated, and the use of dust suppressants will be applied to internal haul roads and processing areas as required.
- A Spills Contingency Program will be developed prior to site operations and followed during operations.
- Fuel storage tanks will be installed and maintained according to the *Technical Standards and Safety Act*.
- If required, an Environmental Compliance Approval will be secured to carry out operations.
- If required, a Permit to Take Water will be secured.
- Topsoil will be stripped sequentially prior to aggregate extraction.
- Topsoil and overburden stripped during the operation will be stored separately with vegetated slopes to promote stability and control erosion.
- Adequate vegetation will be established and maintained to control erosion of any berm or stockpile.
- Scrap may only be stored temporarily and cannot be located within 30 m of any body of water or 30 metres from the boundary of the Site.
- Excavation is to be set back 15 metres from the boundaries of the Site and 30 metres from any body of water that is not the result of excavation below the water table.
- All excavation faces are to be stabilized to prevent erosion.
- All stripped topsoil or overburden will be used in the rehabilitation of the Site.
- Adequate vegetation is established and maintained to control erosion of any topsoil or overburden replaced for rehabilitation purposes.

- Rehabilitation will ensure adequate drainage and vegetation is provided and any compaction is alleviated.

Technical recommendations above and beyond the aforementioned conditions and standards are offered in **Section 6** to avoid and/or minimize the potential for impacts to the significant natural features identified. Certain technical recommendations apply to several natural features and/or species simultaneously; as such, all technical recommendations should be read and considered in their entirety. All technical recommendations offered herein are incorporated into the ARA Site Plans provided in **Appendix 8** while the recommended feature and habitat setbacks are also shown on **Figure 3**.

6.1 Significant Wildlife Habitat

Per the assessment in **Section 4.2**, one (1) SWH type was considered further through this study:

- Habitat of Species of Conservation Concern
 1. Special Concern and Rare Wildlife Species

This habitat type was considered further as four (4) Special Concern or provincially rare species are considered to have a possible likelihood of occurrence within the Site given their habitat associations and current distribution in southern Ontario (or were confirmed during the fieldwork program):

- 1) American Bumble Bee (*Bombus pensylvanicus*)
- 2) Monarch (*Danaus plexippus*)
- 3) Yellow Banded Bumble Bee (*Bombus terricola*)
- 4) Snapping Turtle (*Chelydra serpentina*)

General nectaring habitat for American Bumble Bee, Monarch, and Yellow Banded Bumble Bee is associated with the meadow habitats on Site. While Common Milkweed (*Asclepias syriaca*) was present within the Site, it was relatively infrequent and not in sufficient abundance to be considered a significant ovipositing area for Monarch. To enhance the nectaring and ovipositing habitat within the 30 m Environmental Protection Area adjacent to Medway Creek the following measure is recommended:

- **Native wildflowers and milkweed species will be included as part of the seed mix for the realigned Medway Creek riparian area.**

Snapping Turtle was not observed during field studies but is likely to occur periodically within the aggregate ponds and/or Medway Creek. To ensure this species is not negatively affected by the proposed amendment the following measure is recommended.

- **A survey for turtles will be undertaken concurrently with the fish rescue prior to realignment of Medway Creek under the authority of a Wildlife Scientific Collector's Authorization issued by MNR.**
- **Any turtles encountered will be relocated to suitable habitat upstream or downstream of the Medway Creek realignment area.**

6.2 Provincially Significant Earth Science ANSI

The Provincially Significant Elginfield Area Earth Science ANSI extends within the current licence boundary but does not overlap with Medway Creek or the area where the extraction limit is being amended. No impacts to the ANSI are anticipated as a result of the proposed site plan amendments.

6.3 Habitat of Endangered and Threatened Species

As discussed in **Section 4.4**, two Threatened species were documented during surveys completed as part of this NER, Barn Swallow, Bank Swallow, and Bobolink. While no breeding habitat was identified for these species, mitigation measures are provided below to further avoid the potential for impacts to Bank Swallow and Bobolink these species.

6.3.1 Bank Swallow

No evidence of nesting by Bank Swallow was documented during the 2022 fieldwork program. This species frequently nests in vertical or near-vertical (i.e., above 75°) aggregate stockpiles and pit faces containing sandy overburden. If any Bank Swallow colonies occupy future aggregate stockpiles or pit faces within the Site during the nesting season (i.e., approximately April to late August for this species), this would likely result in the need for temporary cessation of nearby pit operations until the birds have completed nesting. To avoid impacts to this Threatened species, the following measure is recommended:

- **All aggregate operations within the Site will be undertaken consistent with the document titled “Best Management Practices for the Protection, Creation and Maintenance of Bank Swallow Habitat in Ontario” (OMNRF 2017).**

6.3.2 Bobolink

While Bobolink was not confirmed to be breeding within the Site during breeding bird surveys, a timing restriction on vegetation removal is advised. This will avoid impacts on this Threatened species and address the requirements of the *Migratory Birds Convention Act* for all potentially breeding bird species on site:

- **All necessary vegetation removal (e.g., trees, meadow vegetation) will be completed outside the primary bird nesting period (i.e., to be completed between September 1 and March 31). Should minor vegetation removal be proposed during the restricted timing window within readily searchable habitat types, a bird nesting survey will be undertaken to confirm the presence or absence of nesting birds or bird nests within or adjacent to the areas subject to vegetation clearance. The bird nesting survey is to take place within 48 hours of vegetation removal.**

6.4 Fish Habitat

The proposed amendment to the extraction area at Stanley Pit must be facilitated by relocation Medway Creek as it flows through the Site. This will be accomplished through the implementation

of the Stanley Pit Natural Channel Design prepared by Greck and Associates (see **Appendix 9**). The watercourse realignment was prepared based on the following parameters:

- The need to generally maintain existing channel dimensions and overall length and area to avoid a net loss of aquatic habitat.
- The need to incorporate dense riparian plantings, which will represent an improvement over conditions at the existing channel which contains limited overhanging woody vegetation to provide shade.
- The need to incorporate habitat elements such as coarse woody debris and riffle/pool sequences.
- The need to achieve a net improvement in aquatic habitat conditions beyond existing conditions.

Through their hydrogeological assessment, Novaterra (2024) has demonstrated that the hydrologic regime of Medway Creek will be maintained post-re-alignment and following the amendment to the aggregate extraction area. They have also identified that the bed of the realigned watercourse will partially extend through different subsurface materials (i.e., clay till) as compared to the subsoil conditions along the existing channel (i.e., sand, gravel). The change in substrate to finer material may facilitate retention of water within the watercourse for a longer period of time, expanding the longevity of fish and mussel habitat during low flow conditions. Under existing conditions, Medway Creek within the Study Area is intermittent, which can result in fish and mussel mortality due to stranding, increased risk of predation, and depleted dissolved oxygen. Significant mussel mortality is known to occur during low-flow and dry conditions based on surveys by UTRCA and Terrastory in 2020.

A Request for Review was submitted to the Department of Fisheries and Oceans (DFO) on 18 July 2023. In response to the Request for Review, DFO provided a Letter of Advice (LoA) on 11 December 2023 (see **Appendix 10**). Measures provided by DFO in the LoA to avoid and mitigate the potential for prohibited effects to fish and fish habitat include:

- Plan in-water works, undertakings and activities to respect timing windows (March 15 to July 15) to protect fish and fish habitat.
- Limit the duration of in-water works, undertakings and activities so as to not diminish the ability of fish to carry out one or more of their life processes (e.g., spawning, rearing, feeding, migrating).
- Screen intake pipes to prevent entrainment or impingement of fish.
 - Follow the Interim code of practice: End of pipe fish protection screens for small water intakes in freshwater, when using pumps.
- Capture and relocate any fish trapped within an isolated/enclosed work area and safely relocate them to an appropriate location in the same waterbody.
 - Dewater gradually to reduce the potential for stranding fish.
 - Relocate any fish as per applicable permits for capturing and relocating fish.
- Use temporary cofferdams and diversion channels to isolate a section of a watercourse or water body in order to conduct works, undertakings and activities in the dry while maintaining the natural downstream flow.
 - Follow the Interim standard: in-water site isolations, when using temporary cofferdams and diversion channels.

- Maintain fish passage during all phases of works, undertakings and activities.
 - Avoid changing flow or water levels.
 - Avoid obstructing and interfering with the movement and migration of fish.
 - Maintain an appropriate depth and flow (i.e., base flow and seasonal flow of water).
 - Conduct works, undertakings and activities during periods of low flow.
- Maintain an appropriate depth and flow (i.e., base flow and seasonal flow of water) for the protection of fish and fish habitat.
- Salvage, reinstate or match habitat structure (e.g., large wood debris, boulders, instream aquatic vegetation/substrate) to its natural state.
- Install effect erosion and sediment control measures prior to beginning works, undertakings and activities.
 - Schedule work to avoid wet, windy and rainy periods and heed weather advisories.
 - Use only clean materials (e.g., rock, coarse gravel, wood, steel, snow) for works, undertaking and activities.
 - Conduct all in-water works, undertakings and activities in isolation of open or flowing water to reduce the introduction of sediment into the watercourse.
 - Dispose of and stabilize all excavated material above the ordinary high-water mark or top of bank nearby water bodies and ensure sediment re-entry to the watercourse is prevented.
 - Regularly inspect and maintain the sediment control measures and structures during all phases of the project.
 - Regularly monitor the watercourse for signs of sedimentation during all phases of the works, undertakings and activities and take corrective action when needed.
 - Keep the erosion and sediment control measures in place until all disturbed ground has been permanently stabilized.
 - Remove all sediment control materials once site has been stabilized.
- Develop and immediately implement a response plan to prevent deleterious substances from entering a water body.

The following measure is recommended in relation to extraction setbacks from realigned channel of Medway Creek and fish habitat therein:

- **All extraction, operational activities and disturbances will be set back a minimum of 30 m from the realigned channel banks of Medway Creek.**
- **The 30 m setback areas will be seeded and planted consistent with the Natural Channel Relocation Plan (Greck and Associates) and will be treated as natural, self-sustaining vegetation (no mow or agricultural uses).**

To ensure that DFO's advice is appropriately captured within the updated Site Plans, the following measure is recommended:

- **All fish and mussel species will be relocated downstream and immediately prior to redirection of flows to the new channel of Medway Creek under the authority of a Licence to Collect Fish for Scientific Purposes issued by MNRF.**

- **All measures recommended by DFO per their 11 December 2023 Letter of Advice will be implemented as part of realigning Medway Creek.**

7 APPLICABLE NATURAL HERITAGE AND ENVIRONMENTAL POLICIES

The following sections summarize the various municipal, provincial, and federal environmental policies that apply to the proposed pit operations plan and describe how the recommendations provided in this study will address these policies (where applicable). The overall intent of the NER is to satisfy applicable natural heritage policies.

7.1 *Aggregate Resources Act, R.S. O. 1990, c. A.8*

The information and recommendations provided in this report satisfy the requirements for completion of a Natural Environment Report pursuant to Section 2.2 of the compiled Aggregate Resources of Ontario Standards. The following significant natural features per ARA policies were identified within the Study Area:

- Significant Wildlife Habitat, including:
 - Habitats for Species of Conservation Concern:
 - American Bumble Bee, Monarch Butterfly, and Yellow Banded Bumble Bee are all considered habitat generalists and are known to occur in a wide variety of habitats. Based on this candidate habitat may be present within the Study Area.
- The Provincially Significant Elginfield Area Earth Science Area of Natural and Scientific Interest.
- Fish Habitat

Terrastory reviewed potential impacts to the documented natural heritage features components in **Section 6** of this NER. The Site Plan (see **Appendix 8**) incorporates the relocation of Medway Creek. This will be accomplished through the implementation of the Stanley Pit Natural Channel Design prepared by Greck and Associates (**Appendix 9**). A comprehensive mitigation and enhancement framework, including measures recommended by DFO in the LoA, is also provided per the technical recommendations in **Section 6** (which have been incorporated directly onto the Site Plan).

Implementation of the technical recommendations allows for appropriate protection of all significant natural features consistent with relevant ARA standards.

7.2 *Provincial Endangered Species Act, S.O. 2007, c. 6*

The *Endangered Species Act* (ESA) is administered by MECP and protects designated Endangered and Threatened species in Ontario from being killed, harmed, or harassed (s. 9) or having their habitat damaged or destroyed (s. 10). The protection afforded to Endangered and Threatened species “habitat” is either prescribed by O. Reg. 832/21, or (for those species that lack regulated habitat) is defined as *an area on which the species depends, directly or indirectly, to carry on its life processes, including life processes such as reproduction, rearing, hibernation, migration or feeding*. Activities that constitute habitat damage and/or destruction can only proceed subject to the requirements of ESA section 17, a

notice of activity registration per O. Reg. 242/08 or O. Reg. 830/21 (where applicable), or (in limited circumstances) payment of a species conservation charge per O. Reg. 830/21.

A detailed assessment of confirmed and potential Endangered and Threatened habitats within the Study Area is provided in **Appendix 7**. Per this assessment, and provided that relevant technical recommendations outlined in **Section 6** are implemented in full, no impacts to Endangered or Threatened species are anticipated.

7.3 Federal Migratory Birds Convention Act, S.C. 1994, c. 22

Section 6 of the Migratory Birds Regulations under the *Migratory Birds Convention Act, 1994* (MBCA) prohibits the disturbance or destruction of nests, eggs, or nest shelters of a migratory bird. The provincial *Fish and Wildlife Conservation Act, 1997* extends the protection of bird nests and eggs to certain species not listed under the Migratory Birds Regulations (e.g., Corvids, Strigids, Accipitrids, etc.).

Provided that the recommendations outlined in **Section 6** are implemented in full (i.e., prohibition on vegetation removal during the bird breeding season), no impacts to breeding birds or bird nests protected by the MBCA or FWCA are anticipated.

8 CONCLUSIONS

In accordance with applicable standards for Major Site Plan Amendments pursuant to the *Aggregate Resources Act*, the preceding NER provides a detailed characterization of the natural environment occurring within and adjacent to the Stanley Pit.

This NER has been prepared in support of an aggregate licence amendment submitted for consideration by the MNRF (and any other agencies or bodies circulated by same). Included herein is a comprehensive approach to identifying the presence or absence of several significant natural features afforded varying degrees of protection by applicable environmental policies, particularly the ARA Provincial Standards, *Endangered Species Act*, and *Fisheries Act*. The potential for negative effects to the documented significant natural features are described with mitigation measures and technical recommendations offered to avoid or minimize such impacts and/or offer enhancements as appropriate.

Based on the findings presented in this report, the following natural features with ecological and/or policy significance have been identified within the Study Area:

- Candidate **Significant Wildlife Habitat** for certain species of conservation interest (e.g., American Bumble Bee, Monarch, and Yellow Banded Bumble Bee)
- The **Provincially Significant Elginfield Area Earth Science Area of Natural and Scientific Interest**.
- **Fish Habitat** in Medway Creek

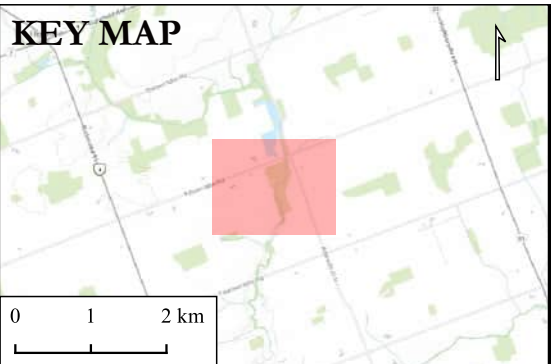
The updated Site Plan (see **Appendix 8**) proposes the relocation of Medway Creek. This will be accomplished through the implementation of the Stanley Pit Natural Channel Design prepared by Greck and Associates (see **Appendix 9**) and technical recommendations provided by DFO pursuant to a Letter of Advice dated 11 December 2023 (**Appendix 10**). All aggregate operations within the Site will be undertaken consistent with the document titled “Best Management Practices for the

Protection, Creation and Maintenance of Bank Swallow Habitat in Ontario” (OMNRF 2017). Additional technical recommendations (e.g., timing restriction on vegetation removal) are further offered herein and have been incorporated into the proposed ARA Site Plans.

Overall, it has been determined that no negative impacts to the above-noted significant natural features will occur provided that all technical recommendations offered in **Section 6** are implemented in full. The ARA Site Plan that directs and constrains pit operations (**Appendix 8**) incorporates all technical recommendations made herein.

9 REFERENCES

- Bird Studies Canada, Environment Canada, Ontario Field Ornithologists, and Ontario Ministry of Natural Resources Ontario Nature. 2001. “Ontario Breeding Bird Atlas: Guide for Participants.”
- Bradley, D. J. 2013. “Southern Ontario Vascular Plant Species List.”
- Cadman, M. D., D. A. Sutherland, G. G. Beck, D. Lepage, and A. R. Couturier. 2007. *Atlas of the Breeding Birds of Ontario, 2001–2005*.
- Chapman, L. J., and D. F. Putnam. 1984. “Physiography of Southern Ontario.”
- DFO. 2019. “Fish and Fish Habitat Protection Policy Statement.”
- Dobbyn, J. S. 2005. *Atlas of the Mammals of Ontario*.
- Hagerty, T. P., and M. S. Kingston. 1992. “The Soils of Middlesex County.”
- Lee, H. T. 2008. “Southern Ontario Ecological Land Classification: Vegetation Type List.”
- Lee, H. T., W. D. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig, and S. McMurray. 1998. “Ecological Land Classification for Southern Ontario: First Approximation and Its Application.”
- MNR. 2010. “Natural Heritage Reference Manual.”
- MNRF. 2015. “Significant Wildlife Habitat Criteria Schedules for Ecoregion 6E.”
- Oldham, M. 2017. “List of Vascular Plants of Ontario’s Carolinian Zone (Ecoregion 7E).”
- Ontario Geological Survey. 2010. “Surficial Geology of Southern Ontario.”
- Ontario Ministry of Natural Resources. 2011. “Survey Methodology under the Endangered Species Act , 2007 : *Dolichonyx Oryzivorus* (Bobolink).”
- UTRCA. 2022. “2022 Watershed Report Card Medway Creek.”



Legend

Study Area

- Subject Property
- Site
- Study Area

GENERAL NOTES:
 -Features depicted herein should not be used in place of a professional survey.
 -Numeric scale is for a 11x17 inch print.

TERRASTORY
 environmental consulting inc.
 info@terrastoryenviro.com 905.745.5398

1:5,000

0 50 100 150 m

Location:
 Stanley Pit,
 Municipality of Middlesex Centre

Project No.: 2098	Figure 1: Location of the Site
Date: 2024-03-11	
By: RA Checked: TK	
Orthophotograph Date: Google, 2020	



Legend

Area of Assessment

- Subject Property
- Site
- Study Area

Terrain

- Contours (1m Lake Huron 2022 DTM)

Survey Stations

- Breeding Bird Survey Stations

Biophysical Features and Conditions

- Medway Creek

Vegetation Communities

- Woodland
- Meadow
- Open Water

Vegetation Community

MEGM3 - Dry - Fresh Graminoid Meadow

OAW - Open Water (Gravel Pit Pond)

WODM5 - Fresh - Moist Manitoba Maple Deciduous Woodland

GENERAL NOTES:

- Features depicted herein should not be used in place of a professional survey.
- Numeric scale is for a 11x17 inch print.

TERRASTORY
environmental consulting inc.

info@terrastoryenviro.com 905.745.5398

N

1:3,500

0 25 50 75 100 m

Location:

Stanley Pit,
Municipality of Middlesex Centre

Project No.: 2098

Date: 2024-03-11

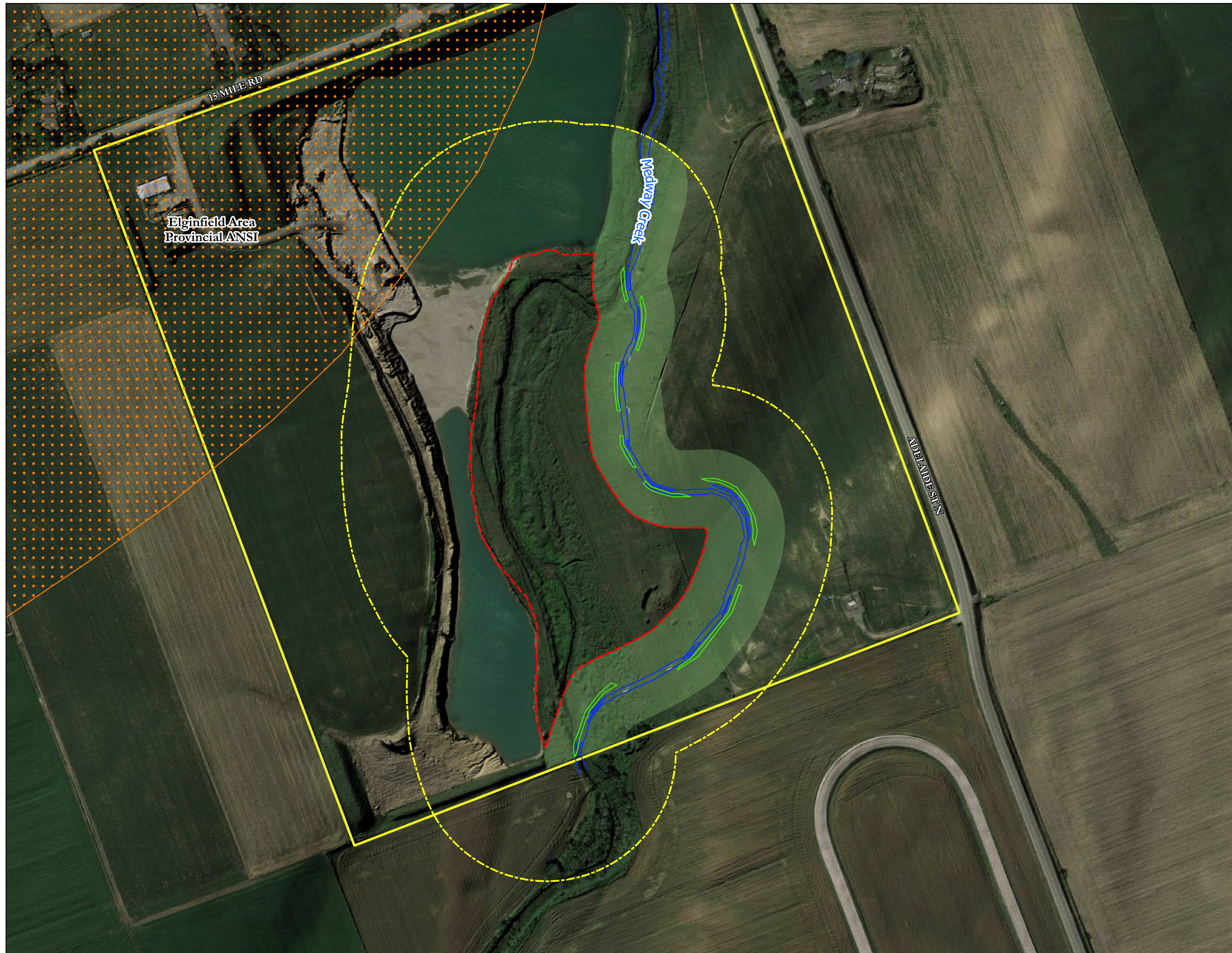
By: RA

Checked: TK

Orthophotograph Date:
Google, 2020

Figure 2:

Biophysical
Features and
Conditions



Legend

Area of Assessment

- Subject Property
- Site
- Study Area

Significant Natural Features

- Medway Creek (Realigned)
- Earth Science ANSI

Setbacks

- Medway Creek 30 m Environmental Protection Area

Other Features

- Tree / Shrub Plantings

GENERAL NOTES:

- Features depicted herein should not be used in place of a professional survey.
- Numeric scale is for a 11x17 inch print.



TERRASTORY
environmental consulting inc.

info@terrastoryenviro.com

905.745.5398



1:3,500

0 25 50 75 100 m



Location:

Stanley Pit,
Municipality of Middlesex Centre

Project No.: 2098

Date: 2024-03-11

By: RA

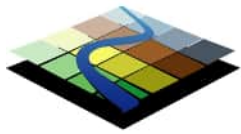
Checked: TK

Orthophotograph Date:
Google, 2020

Figure 3:

Significant
Natural Features
and Prescribed
Setbacks

Appendix 1. Curriculum Vitae



TERRASTORY

environmental consulting inc.

Tristan L. Knight, M.E.S., M.Sc.
Senior Ecologist / President
Curriculum Vitae

CAREER HISTORY AND EDUCATION

2018–Present	Senior Ecologist / President, Terrastory Environmental Consulting Inc.
2014 – 2018	Ecologist / Botanist, RiverStone Environmental Solutions Inc.
2013–2014	Watershed Restoration Technician, Credit Valley Conservation Authority
2012–2013	Terrestrial Ecologist, Aquafor Beech Ltd.
2011–2012	Wetland Biologist / Asst. SAR Biologist, Ontario Ministry of Natural Resources
2009–2011	Master of Science, SUNY College of Environmental Science and Forestry, Syracuse, NY, USA
2007–2009	Master of Environmental Studies, York University, Toronto, ON
2003–2007	Hons. Bachelor of Arts, University of Western Ontario, London, ON

RELEVANT CERTIFICATIONS AND TRAINING

2021	ISA Tree Risk Assessment Qualification (TRAQ) Renewal
2019	Butternut Health Assessor (#268) Renewal
2016	Managed Forest Plan Approver (#421)
2015	Vegetation Sampling Protocol
2014	Ontario Stream Assessment Protocol (OSAP)
2014	Fish Identification “Level 2”
2014	Electrofishing “Class 2”
2013	ISA Certified Arborist #ON-1663A
2012	Ontario Benthos Biomonitoring Network (OBBN)
2012	Ontario Wetland Evaluation System (OWES) Instructor
2011	Family-level Benthic Invertebrate ID Workshop
2011	Ontario Wetland Evaluation System (OWES)
2011	Ecological Land Classification (ELC)

PROFESSIONAL EXPERIENCE

Tristan has over ten years of experience as an environmental professional acting in diverse private- and public-sector roles. He applies intimate knowledge of the environmental policy context guiding development in Ontario to projects large and small. Tristan’s regular client base spans the entire development industry and includes land developers, aggregate producers, municipal infrastructure, and green energy. Tristan is also a highly accomplished field ecologist with professional training in innumerable provincial collection protocols including Ecological Land Classification, Ontario Wetland Evaluation System, Ontario Stream Assessment Protocol, Ontario Benthos Biomonitoring Network, and Vegetation Sampling Protocol. He is an ISA-certified Arborist, ISA-qualified Tree Risk Assessor, Butternut Health Assessor, and Managed Forest Plan approver. He is also a former instructor of the Ontario Wetland Evaluation System certification course and a current instructor with the Ontario Master Naturalist Program (Lakehead University, Orillia Campus) and Ontario Natural Certification Course (Kortright Centre). Drawing on a diverse mixture of project management and field expertise, he is single-mindedly focused on generating high-quality deliverables that exceed expectations. Above all, Tristan undertakes his work with utmost integrity, objectiveness, and concern for detail.

The following is a selected list of Tristan's consulting project experience since founding Terrastory in February 2018.

Environmental Impact Studies for Land Development (Large Applications)

- 2018-present **Environmental Impact Statement** in the Township of Severn in support of an estate residential subdivision.
- Three-season ecological surveys and assessments (amphibians, vascular plants, vegetation mapping, bats, etc.).
 - Graphics, reporting, policy conformity assessments.
- 2019-present **Environmental Impact Statement** in the City of Welland for an 870 unit residential and mixed-use subdivision.
- Three-season ecological surveys and assessments (amphibians, breeding birds, bat acoustic monitoring, vascular plants, vegetation mapping, etc.).
 - Wetland and woodland enhancement/compensation plans.
 - Rare species relocation plans and implementation.
 - Graphics, reporting, policy conformity assessments.
- 2019 **Environmental Impact Statement** in the City of Orillia in support of a waterfront community.
- Three-season ecological surveys and assessments (e.g., breeding birds, vascular plants, vegetation mapping, bat habitat, aquatic habitat, etc.).
 - Graphics, reporting, policy conformity assessments.
- 2020 **Environmental Impact Statement** in the City of Orillia in support of a waterfront community.
- Three-season ecological surveys and assessments (e.g., breeding birds, vascular plants, vegetation mapping, bat habitat, aquatic habitat, etc.).
 - Butternut Health Assessment.
 - Graphics, reporting, policy conformity assessments.
- 2020-present **Environmental Impact Statement** in the Township of Wainfleet in support of an estate residential community.
- Ecological assessments and species at risk surveys.
 - Graphics, reporting, policy conformity assessments.
- 2020-present **Subwatershed Impact Study** in the Town of Halton Hills in support of a multi-phase warehouse distribution centre.
- Three-season ecological surveys and assessments (amphibians, breeding birds, owls, vascular plants, hawthorns, vegetation mapping, headwater drainage features, odonates, butterflies, etc.).
 - Arborist Report and Tree Protection Plan.
 - Graphics, reporting, policy conformity assessments.
 - Review and integration of other technical disciplines including fluvial geomorphology, hydrogeology, hydrology and hydraulics, stormwater management, landscape architecture.

Environmental Impact Studies for Land Development (Small Applications)

- 2018 **Environmental Impact Statement** in the City of Kawartha Lakes in support of a site plan and Kawartha Conservation permit application.
- Ecological and species at risk surveys.
 - Wetland delineation.
 - Graphics, reporting, policy conformity assessments.
- 2018 **Environmental Impact Statement** in the Township of Ramara in support of a severance application.
- Ecological and species at risk surveys.
 - Wetland staking.
 - Graphics, reporting, policy conformity assessments.

- 2018 **Environmental Impact Statement** in the City of Orillia in support of a site plan application.
- Ecological and species at risk surveys.
 - Graphics, reporting, policy conformity assessments.
- 2018-2019 **Natural Heritage Evaluation** in the City of Burlington in support of a severance application and Niagara Escarpment development permit.
- Ecological and species at risk surveys.
 - Woodland dripline staking with agency staff.
 - Graphics, reporting, policy conformity assessments.
- 2019 **Environmental Impact Statement** in the Town of Gravenhurst in support of a site plan application.
- Ecological and species at risk surveys.
 - Graphics, reporting, policy conformity assessments.
- 2019 **Environmental Impact Statement** in the Township of Severn in support of a site plan application.
- Ecological and species at risk surveys.
 - Graphics, reporting, policy conformity assessments.
- 2019 **Natural Heritage Evaluation** in the Town of Caledon in support of a site plan application.
- Ecological and species at risk surveys.
 - Graphics, reporting, policy conformity assessments.
- 2019 **Natural Heritage Evaluation** in the Town of Whitchurch-Stouffville in support of a site plan and TRCA permit application.
- Ecological and species at risk surveys.
 - Graphics, reporting, policy conformity assessments.
- 2019 **Environmental Impact Statement** in the Township of Wainfleet in support of a site plan application.
- Ecological and species at risk surveys.
 - Graphics, reporting, policy conformity assessments.
- 2019 **Environmental Impact Statement** in the Township of Chatsworth in support of a site plan application.
- Ecological and species at risk surveys.
 - Graphics, reporting, policy conformity assessments.
- 2020 **Environmental Impact Statement** in the City of Kawartha Lakes in support of a site plan application.
- Ecological and species at risk surveys.
 - Wetland compensation plan.
 - Graphics, reporting, policy conformity assessments.
- 2021-present **Environmental Impact Statement** in the Town of Whitby in support of a site plan application and Conservation Authority permit.
- Three-season biophysical assessments and surveys.
 - Graphics, reporting, policy conformity assessments.

Environmental Impact Studies for Land Development (Other)

- 2018-2019 **Environmental Impact Statement** in the Township of Woolwich in support of a site plan application and GRCA permit application to construct a boardwalk trail.
- Three-season ecological surveys and assessments (e.g., breeding birds, vascular plants, wetland delineation, vegetation mapping, etc.).
 - Wetland delineation with GRCA staff.
 - Graphics, reporting, policy conformity assessments.
- 2018-2019 **Environmental Impact Statement** in the Town of Whitchurch-Stouffville in support of a site plan application to expand an existing cemetery.

- Tree inventory, terrestrial/wetland/aquatic surveys, Butternut Health Assessment.
 - Graphics, reporting, policy conformity assessments.
- 2018 **Environmental Impact Statement** in the City of Welland in support of a site plan application to construct a storage facility.
- Ecological and species at risk surveys.
 - Graphics, reporting, policy conformity assessments.

Natural Environment Reports for Aggregate Applications

- 2019-2020 **Natural Environment Report** in the Municipality of Thames Centre in support of an *Aggregate Resources Act* application and related *Planning Act* applications.
- Ecological and species at risk surveys (e.g., breeding birds, vegetation mapping, vascular plants, etc.).
 - Graphics, reporting, policy conformity assessments.
- 2019-2020 **Natural Environment Report** in the Township of Huron East in support of an *Aggregate Resources Act* application.
- Ecological and species at risk surveys.
 - Graphics, reporting, policy conformity assessments.
- 2019 **Natural Environment Report** in the County of Haldimand (Hagersville) in support of an *Aggregate Resources Act* application.
- Ecological and species at risk surveys.
 - Graphics, reporting, policy conformity assessments.
- 2020 **Natural Environment Report** in the Municipality of Thames Centre (Thorndale) in support of an *Aggregate Resources Act* application and related *Planning Act* applications.
- Ecological and species at risk surveys (e.g., breeding birds, vegetation mapping, vascular plants, etc.).
 - Graphics, reporting, policy conformity assessments.

Arborist Report and Tree Preservation Plans

- 2018 **Arborist Report and Tree Preservation Plan** in the Town of Whitchurch-Stouffville in support of a cemetery expansion.
- Tree inventory, health assessment, structural assessment.
 - Graphics, reporting, policy conformity assessments.
- 2018 **Arborist Report and Tree Preservation Plan** in the City of Hamilton in support of a condominium development.
- Tree inventory, health assessment, structural assessment.
 - Graphics, reporting, policy conformity assessments.
- 2018 **Arborist Report and Tree Preservation Plan** in the City of Toronto in support of a cemetery expansion.
- Tree inventory, health assessment, structural assessment.
 - Graphics, reporting, policy conformity assessments.
- 2018 **Arborist Report and Tree Preservation Plan** in the Town of Milton in support of a new school and block development plan.
- Tree inventory, health assessment, structural assessment.
 - Graphics, reporting, policy conformity assessments.
- 2019 **Arborist Report and Tree Preservation Plan** in the Town of Caledon in support of a site plan application.
- Tree inventory, health assessment, structural assessment.
 - Graphics, reporting, policy conformity assessments.
- 2019 **Tree Saving Plan** in the City of Thorold in support of a residential subdivision.
- Tree inventory, health assessment, structural assessment.

- 2019
 - Graphics, reporting, policy conformity assessments.

Arborist Report and Tree Preservation Plan in the Town of Ajax in support of a condominium development.

 - Tree inventory, health assessment, structural assessment.
 - Graphics, reporting, policy conformity assessments.
- 2019
 - Tree inventory, health assessment, structural assessment.
 - Graphics, reporting, policy conformity assessments.

Arborist Report and Tree Preservation Plan in the City of Toronto in support of a condominium development.

 - Tree inventory, health assessment, structural assessment.
 - Graphics, reporting, policy conformity assessments.
- 2019
 - Tree inventory, health assessment, structural assessment.
 - Graphics, reporting, policy conformity assessments.

Arborist Report and Tree Preservation Plan in the City of Hamilton in support of an Enbridge gas pipeline expansion.

 - Tree inventory, health assessment, structural assessment.
 - Graphics, reporting, policy conformity assessments.
- 2020
 - Tree inventory, health assessment, structural assessment.
 - Graphics, reporting, policy conformity assessments.

Arborist Report and Tree Preservation Plan in the City of Kitchener in support of a church conversion to residential purposes.

 - Tree inventory, health assessment, structural assessment.
 - Graphics, reporting, policy conformity assessments.
- 2020
 - Tree inventory, health assessment, structural assessment.
 - Graphics, reporting, policy conformity assessments.

Arborist Report and Tree Preservation Plan in the City of Toronto in support of a large distribution centre.

 - Tree inventory, health assessment, structural assessment.
 - Graphics, reporting, policy conformity assessments.
- 2020
 - Tree inventory, health assessment, structural assessment.
 - Graphics, reporting, policy conformity assessments.

Arborist Report and Tree Preservation Plan in the City of Burlington in support of a residential apartment building.

 - Tree inventory, health assessment, structural assessment.
 - Graphics, reporting, policy conformity assessments.
- 2020
 - Tree inventory, health assessment, structural assessment.
 - Graphics, reporting, policy conformity assessments.

Arborist Report and Tree Preservation Plan in the Town of Oakville in support of a school construction.

 - Tree inventory, health assessment, structural assessment.
 - Graphics, reporting, policy conformity assessments.
- 2020
 - Tree inventory, health assessment, structural assessment.
 - Graphics, reporting, policy conformity assessments.

Tree Management Plan in the Town of Oakville in support of a school construction.

 - Tree inventory, health assessment, structural assessment.
 - Graphics, reporting, policy conformity assessments.

Municipal Class Environmental Assessments

- 2020-ongoing
 - Ecological and species at risk surveys (e.g., fish habitat assessment, vegetation surveys, etc.).
 - Ecological input to alternatives assessment.
 - Graphics, reporting, policy conformity assessments.

Municipal Class Environmental Assessment (Schedule A) in the Township of Severn in support of a culvert replacement.
- 2020
 - Ecological and species at risk surveys (e.g., fish habitat assessment, vegetation surveys, etc.).
 - Ecological input to alternatives assessment.
 - Graphics, reporting, policy conformity assessments.

Natural Heritage Review in support of an Environmental Assessment of a proposed new Forcemain to an existing Wastewater Treatment plan in the City of Port Colborne.

Natural Heritage Constraints Analyses

- 2018
 - Site reconnaissance assessment.
 - Graphics, reporting, policy assessments.

Natural Heritage Constraints Analysis in the Town of Bracebridge to assess development potential.

- 2018 **Natural Heritage Constraints Analysis** in the Township of Puslinch to assess development potential.
- Site reconnaissance assessment.
 - Graphics, reporting, policy assessments.
- 2018 **Natural Heritage Constraints Analysis** in the Town of East Gwillimbury to assess development potential.
- Site reconnaissance assessment.
 - Graphics, reporting, policy assessments.
- 2018 **Natural Heritage Constraints Analysis** in the County of Brant to assess potential to construct a wind turbine and secure a future Renewable Energy Approval.
- Site reconnaissance assessment.
 - Graphics, reporting, policy assessments.
- 2018 **Natural Heritage Constraints Analysis** in the City of Hamilton to assess development potential.
- Site reconnaissance assessment.
 - Graphics, reporting, policy assessments.
- 2019 **Natural Heritage Constraints Analysis** in the City of Kawartha Lakes to assess development potential to expand an existing aggregate quarry.
- Terrestrial/wetland/aquatic surveys, species at risk surveys.
 - Graphics, reporting, policy assessments.
- 2019 **Natural Heritage Constraints Analysis** in the Town of Oakville to assess development potential.
- Site reconnaissance assessment.
 - Graphics, reporting, policy assessments.
- 2019 **Natural Heritage Constraints Analysis** in the City of Welland to assess development potential for a large-scale residential condominium application.
- Site reconnaissance assessment.
 - Graphics, reporting, policy assessments.
- 2019 **Natural Heritage Constraints Analysis** in the City of Kawartha Lakes to assess development potential for a large-scale residential subdivision.
- Site reconnaissance assessment.
 - Graphics, reporting, policy assessments.
- 2019 **Natural Heritage Constraints Analysis** in the City of Welland to assess development potential on a brownfield for a large-scale residential subdivision.
- Site reconnaissance assessment.
 - Graphics, reporting, policy assessments.

Species at Risk Surveys and Recovery

- 2018 **Kentucky Coffee-tree Assessment** in the Town of Niagara-on-the-Lake in support of a residential subdivision.
- Inventory for Kentucky Coffee-tree.
 - Graphics, reporting.
 - Submission of Information Gathering Form to MNRF.
- 2018 **Species at Risk Assessment** in the County of Haldimand in support of a severance application.
- Species at Risk surveys (e.g., vascular plants, habitat-based assessment for other taxa).
 - Graphics, reporting.
 - Correspondence with MNRF.
- 2018 **Butternut Health Assessment** in the Town of Whitchurch-Stouffville in support of a cemetery expansion.
- Butternut Health Assessment.
 - Submission of relevant reporting and correspondence with MNRF.
- 2018 **Golden-eye Lichen (Great Lakes population) Recovery Strategy** for the Ministry of the

- Environment, Conservation, and Parks.
- 2019 **Chimney Swift Surveys** in the City of Hamilton in support of a redevelopment plan.
- Chimney Swift entrance surveys.
 - Graphics, reporting.
- 2019 **Bat Habitat Assessment** in the City of Hamilton in support of a site plan application.
- Habitat-based surveys.
 - Graphics, reporting.
- 2021-present **Spoon-leaved Moss Recovery Strategy** for the Ministry of the Environment, Conservation, and Parks.

Fish Habitat Impact Assessments

- 2018 **Fish Habitat Impact Assessment** in the Township of Muskoka Lakes in support of a site plan application.
- Aquatic habitat assessment.
 - Graphics, reporting, policy conformity assessment.
- 2019 **Fish Habitat Impact Assessment** in the Township of Georgian Bay in support of a site plan application.
- Aquatic habitat assessment.
 - Graphics, reporting, policy conformity assessment.
- 2020 **Fish Habitat Impact Assessment** in the Town of Huntsville in support of a severance application.
- Aquatic habitat assessment and fish habitat mapping.
 - Graphics, reporting, policy conformity assessment.
- 2021 **Fish Habitat Impact Assessment** in the Town of Huntsville in support of a severance application.
- Aquatic habitat assessment and fish habitat mapping.
 - Graphics, reporting, policy conformity assessment.

Peer Review

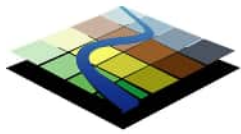
- 2019 **Peer Review** in the Municipality of Clarington in reference to a subdivision application.
- Critical assessment of EIS in support of the subdivision.
 - Presentation to Council (Oct. 2019).
- 2020-ongoing **Peer Review** in the Town of Huntsville in reference to an island-based development application.
- Critical assessment of EIS in support of the subdivision.
 - Presentation of expert opinion to LPAT.

Managed Forest Plans

- 2019 **Managed Forest Plan** in the City of Hamilton (Stoney Creek) for a private client.
- 2020 **Managed Forest Plan** in the City of Hamilton (Flamborough) for a private client.
- 2020 **Managed Forest Plan** in the Town of Erin for a private client.

Instruction

- 2018-ongoing **Instructor** in Bryophyte Identification and Lichen Identification courses at the Master Naturalist Program at Lakehead University (Orillia campus).
- 2019-ongoing **Instructor** in Bryophyte Identification at the Ontario Natural Certification Course in the Kortright Centre (City of Vaughan).
- 2021-ongoing **Workshop Development** for Niagara Peninsula Conservation Authority staff to provide training in vascular plant identification in sensitive habitats (e.g., marshes, swamps, dunes).



TERRASTORY

environmental consulting inc.

Rob Aitken, B. Sc.
Senior Ecologist / GIS Specialist
Curriculum Vitae

CAREER HISTORY AND EDUCATION

2021–Present	Senior Ecologist / GIS Specialist, Terrastory Environmental Consulting Inc.
2014–2021	Ecologist, Beacon Environmental Ltd.
2012–2014	Ecologist, AECOM
2010-2012	Ecologist, Aboud & Associates
2008-2010	Environmental Scientist, Conestoga Rovers & Associates
2006-2008	Bachelor of Science (Hons.), Environmental Resource Science & Biology, Trent University
2004-2006	Environmental Technologist Diploma, Sir Sandford Fleming College
2003-2004	Natural Resources Law Enforcement Certificate, Sir Sandford Fleming College
2001-2003	Ecosystem Management Technician Diploma, Sir Sandford Fleming College

CERTIFICATIONS AND TRAINING

2017	Wildlife Conservation Society of Canada Bat Acoustics Training
2017	Class 2 Backpack Electro Fishing Certification
2015	Butternut Health Assessor Certification
2014	MNRF / Ontario Nature Reptile and Amphibian Field Survey Training Course
2011	Ontario Stream Assessment Protocol
2011	MTO/DFO/MNR Protocol for Protecting Fish Habitat Workshop
2010	MNR Ecological Land Classification for Southern Ontario Certification
2009	MNR Ontario Wetland Evaluation Certification
2009	OSAP Level 1 Fish Identification Certification

PROFESSIONAL EXPERIENCE

Rob is a terrestrial ecologist with over 15 years of experience in the environmental field. He has participated in a variety of environmental studies in both terrestrial and aquatic ecosystems including environmental impact studies, environmental assessments, sub-watershed studies, natural heritage studies for renewable energy applications, and tree inventory and management plans. His areas of expertise include: breeding bird surveys, terrestrial species at risk surveys, habitat assessments, wildlife tracking, vascular plant inventories, ecological land classification (ELC), wetland delineation and evaluation, and tree assessments. He has also provided support for electrofishing surveys, aquatic invertebrate surveys, hydraulic stream flow monitoring, and water quality monitoring. Rob regularly compiles background research, conducts data analyses, writes and reviews reports and conducts GIS mapping and analysis for ecological studies of various scales throughout Ontario.

The following is a selected list of Rob's consulting project experience.

Aggregates and Mining

2022	Natural Environmental Report in the Township of Malahide in support of an aggregate extraction operation for Harrington McAvan.
2019-2023	Natural Environment Report, Municipality of Thames Centre.

2014 Natural Environmental Report in Garafraxa Township in support of the expansion of an aggregate operation for Tri-County Aggregates Ltd.

Peer Reviews / Reviews

- 2023 EIS / NHE Peer Review services for the Town of New Tecumseth
- Part of a team that was awarded a contract to provide EIS/NHE peer review services to the Town of New Tecumseth
- 2023 EIS Peer Review, Sideroad 30, Alliston, Town of New Tecumseth
- Critical assessment of EIS in support of a subdivision application.
- 2022 – present Private Tree Bylaw Review and Update, City of Guelph
- Desktop GIS analysis of tree canopy regulated under existing and proposed Tree Bylaw
 - Worked with City staff and council to review effectiveness of existing Tree Bylaw and identify potential areas of improvement.
 - Worked at public booths to discuss the Tree Bylaw with the general public
- 2022 Rolling Hills Natural Heritage System Refinements, City of Guelph
- Completed a peer review of suggested refinements to the Natural Heritage System in the Rolling Hills Study Area.
 - Provided recommendations for refinements and updates for consideration as part of a Municipal Comprehensive Review that was also underway at the time of this assessment.

Environmental Impact Studies for Land Development (Large Applications)

- 2021-2022 Riverside Heights Subdivision Scoped Environmental Impact Statement in the Community of Bobcaygeon in support of a residential subdivision.
- Three-season ecological surveys and assessments (amphibians, vascular plants, vegetation community mapping, Butternut health assessment, bats, etc.).
 - Graphics, reporting, policy conformity assessments.
- 2015-2020 Berczy Glen Secondary Plan Area in the City of Markham in support of the creation and development of the Berczy Glen Secondary Plan Area.
- Three-season ecological surveys and assessments (breeding birds, vascular plants, vegetation community mapping, Butternut health assessment, bats, etc.).
 - Graphics, reporting, policy conformity assessments.
- 2015-2020 Angus Glen Secondary Plan Area in the City of Markham in support of the creation and development of the Angus Glen Secondary Plan Area.
- Three-season ecological surveys and assessments (breeding birds, vascular plants, vegetation community mapping, Butternut health assessment, bats, etc.)
 - Graphics, reporting, policy conformity assessments.
- 2015-2020 Bronte Green Subdivision Environmental Monitoring in the Town of Oakville in support of a residential subdivision.
- Three-season ecological surveys and assessments (amphibians, breeding birds, vascular plants, vegetation community mapping, bats, etc.).
 - Graphics, reporting, policy conformity assessments.
- 2014-2016 Tremaine Dundas Secondary Plan Environmental Implementation Report in the City of Burlington.
- Three-season ecological surveys and assessments (amphibians, breeding birds, vascular plants, vegetation community mapping, Butternut health assessment, bats, etc.).
 - Graphics, reporting, policy conformity assessments.

Environmental Impact Studies for Land Development (Small Applications)

- 2022 Environmental Impact Assessment on 54 Sideroad in the Community of Fergus in support of Minor Variance Application to build a second residence.
- One-season ecological surveys and assessments (vascular plants, vegetation community mapping, Butternut health assessment, etc.).
 - Graphics, reporting, policy conformity assessments.
- 2022 Natural Heritage Evaluation on Rougemont Drive in the City of Pickering in support of a Consent (Severance) Application.
- Graphics, restoration plan, reporting, policy conformity assessments.
- 2022 Environmental Impact Assessment on Eighth Line in the Town of Erin in support of a Consent (Severance) Application.
- One-season ecological surveys and assessments (vascular plants, vegetation community mapping, Butternut health assessment, etc.).
 - Graphics, reporting, policy conformity assessments.
- 2022-2023 Natural Heritage Evaluation on Robinson Street in the Community of Hawkstone in support of a Consent (Severance) Application.
- Two-season ecological surveys and assessments (breeding birds, vascular plants, vegetation community mapping, bats, etc.).
 - Graphics, restoration plan, reporting, policy conformity assessments.
- 2022 Environmental Impact Statement and Tree Preservation Plan on Grey Street in the City of Brantford in support of a Site Plan Application, Zoning By-law Amendment, and Official Plan Amendment.
- One-season ecological surveys and assessments (vascular plants, vegetation community mapping, tree inventory, etc.).
 - Graphics, reporting, policy conformity assessments.
- 2022 Environmental Impact Study on Watt's Pond Road in Brant County in support of a Consent (Severance) Application.
- One-season ecological surveys and assessments (vascular plants, vegetation community mapping, etc.).
 - Graphics, reporting, policy conformity assessments.
- 2022-2023 Environmental Impact Study on Concession 8 in the City of Pickering in support of an application to construct a second residence facilitated by a Minister's Zoning Order.
- Graphics, restoration plan, reporting, policy conformity assessments.
- 2022 Environmental Impact Assessment on Hannat Court in the Town of Milton in support of an application to expand an industrial building.
- One-season ecological surveys and assessments (vascular plants, vegetation community mapping, etc.).
 - Graphics, reporting, policy conformity assessments, submission of an EIA Waiving Application
- 2021 Oak Ridges Moraine Conformity Statement on Larry Street in the Town of Caledon in support of a Site Plan Application to construct a new dwelling.
- Graphics, restoration plan, reporting, policy conformity assessments.
- 2021 Environmental Impact Study on Ridout Street in the Community of Lindsay in support of an application to build a residence.
- One-season ecological surveys and assessments (vascular plants, vegetation community mapping, fish habitat assessment, etc.).
 - Graphics, reporting, policy conformity assessments.

- 2021 Natural Heritage Evaluation on Burns Boulevard in the Community of King City in support of an application to build a residence.
- One-season ecological surveys and assessments (vascular plants, vegetation community mapping, etc.).
 - Graphics, reporting, policy conformity assessments.
- 2021 Environmental Impact Study on Kings Row in the Community of Port Maitland in support of an application to build a garage.
- One-season ecological surveys and assessments (vascular plants, vegetation community mapping, fish habitat assessment, etc.).
 - Graphics, reporting, policy conformity assessments.
- 2021-2022 Environmental Impact Study on Robinson Road in the Community of Dunnville in support of a Consent Application to adjust a lot line.
- Two-season ecological surveys and assessments (vascular plants, vegetation community mapping, etc.).
 - Graphics, reporting, policy conformity assessments.
- 2021-2022 Environmental Impact Study on Wellington Road 34 in the Township of Puslinch in support of a Consent (Severance) Application.
- Two-season ecological surveys and assessments (breeding birds, vascular plants, vegetation community mapping, etc.).
 - Graphics, reporting, policy conformity assessments.
- 2021-2022 Environmental Impact Study on North Marysburgh Court in Prince Edward County in support of an application to build a residence.
- Graphics, reporting, policy conformity assessments.
- 2021-2022 Natural Heritage Evaluation and Arborist Report on Cynthia Crescent in the City of Richmond Hill in support of a Zoning By-law Amendment and Consent (Severance) Application.
- Graphics, reporting, policy conformity assessments.
- 2021 Natural Heritage Evaluation on Mill Street in the Community of Stouffville in support of an application to build a residence.
- One-season ecological surveys and assessments (vascular plants, vegetation community mapping, etc.).
 - Graphics, reporting, policy conformity assessments.
- 2021-2022 Environmental Impact Study on Heartwood Court in the City of Mississauga in support of a Consent (Severance) Application.
- One-season ecological surveys and assessments (vascular plants, vegetation community mapping, etc.).
 - Graphics, reporting, policy conformity assessments.
- 2021-2022 Natural Heritage Impact Study and Tree Protection and Replacement Plan on Tilden Crescent in the City of Toronto in support of a Minor Variance Application.
- One-season ecological surveys and assessments (vascular plants, vegetation community mapping, tree inventory, Butternut health assessment, etc.).
 - Graphics, reporting, policy conformity assessments.
 - Presentation of expert opinion to TRCA Hearing Board.
- 2021-2022 Natural Heritage Evaluation on Vandorf Sideroad in the Town of Whitchurch-Stouffville in support of an application to build a solarium.
- One-season ecological surveys and assessments (vascular plants, vegetation community mapping, etc.).
 - Graphics, reporting, policy conformity assessments.
- 2021-2023 Environmental Impact Study on Elgin Mills Road in the City of Markham in support of a Site Plan Application to build a place of worship.
- Two-season ecological surveys and assessments (breeding birds, vascular plants, vegetation community mapping, etc.).
 - Graphics, reporting, policy conformity assessments.

- 2021 Natural Heritage Evaluation on 12th Concession in the Township of King in support of a Site Plan Application to build a garage.
- Two-season ecological surveys and assessments (breeding birds, vascular plants, vegetation community mapping, etc.).
 - Graphics, restoration plan, reporting, policy conformity assessments.
- 2021 Environmental Impact Statement on Bridge Street in the Township of Wilmot in support of a Site Plan Application to expand an existing metal recycling operation.
- Graphics, restoration plan, reporting, policy conformity assessments.
- 2021 Environmental Impact Study on River Road in Brant County in support of a Consent (Severance) Application.
- Two-season ecological surveys and assessments (breeding birds, vascular plants, vegetation community mapping, etc.).
 - Graphics, reporting, policy conformity assessments.
- 2020-2023 Environmental Impact Study on Old Onondaga Road East in Brant County in support of a Zoning By-law Amendment and Site Plan Application to build a soil stockpile facility.
- Two-season ecological surveys and assessments (breeding birds, vascular plants, vegetation community mapping, etc.).
 - Graphics, reporting, policy conformity assessments.
- 2020-2022 Natural Heritage Evaluation on 4th Line in the Town of New Tecumseth in support of an application to build a residence.
- Graphics, reporting, policy conformity assessments.

Municipal Class Environmental Assessments

- 2022 Natural Heritage Summary in support of a Municipal Class Environmental Assessment in support of the extension of West Street in the Community of Coldwater.
- One-season ecological surveys and assessments (vascular plants, vegetation community mapping, bats, etc.).
 - Graphics, reporting, policy conformity assessments.
- 2021-2022 Curtis Creek Aquatic and Riparian Habitat Assessment in the City of Peterborough
- Two-season ecological surveys and assessments (vascular plants, vegetation community mapping, fish habitat assessment, tree inventory, etc.).
 - Graphics, reporting, policy conformity assessments.
- 2018-2019 Southwest Landfill Environmental Assessment in Oxford County.
- Three-season ecological surveys and assessments (amphibians, birds, turtles, reptiles, vascular plants, vegetation community mapping, Butternut health assessment, bats, etc.).
 - Graphics, reporting, policy conformity assessments.
- 2020-2021 Shorewood and Holyrood Promenade Shoreline Improvements Schedule B Municipal Class Environmental Assessment in the Town of Oakville.
- Two-season ecological surveys and assessments (amphibians, birds, vascular plants, vegetation community mapping, Butternut health assessment, bats, Bank Swallow, etc.).
 - Graphics, reporting, policy conformity assessments.
 - Support for an application for Endangered Species Act 17(2)(c) Overall Benefit Permit.
- 2016 Kitchener Wastewater Treatment Plant Expansion Class A Environmental Assessment.
- Two-season ecological surveys and assessments (birds, vascular plants, vegetation community mapping, etc.).
 - Graphics, reporting, policy conformity assessments.
- 2013 Highway 17 Transportation Environmental Study Report in support of the Group A Class Environmental Assessment completed for Highway 17 near Bonfield.
- Two-season ecological surveys and assessments (amphibians, birds, turtles, vascular plants, vegetation community mapping, etc.).
 - Graphics, reporting, policy conformity assessments.

- 2011 Highway 407 Expansion Rare Species Survey, Durham Region.
- One-season ecological surveys and assessments (rare vascular plants).
 - Graphics, reporting.
- 2011 Rt. Hon. Herb. Gray Parkway Species at Risk Surveys, Ministry of Transportation, City of Windsor.
- Three-season ecological surveys and assessments (reptiles, endangered and threatened vascular plants, assessment of potential restoration locations).
 - Graphics, reporting.

Municipal Studies

- 2021 Environmental Constraints Analysis to establish the principle of use for a proposed Ministerial Zoning Order.
- One-season ecological surveys and assessments (vascular plants, vegetation community mapping, bats, etc.).
 - Graphics, reporting.
- 2020 ELC Update in the City of Guelph as part of the City's Natural Asset Management program.
- Graphics, reporting.
- 2017-2019 Natural Heritage System Update in the City of Peterborough.
- Graphics, reporting.
- 2017-2018 Desktop ELC Mapping for the County of Northumberland
- Graphics, reporting.
- 2017-2018 Paul Coffee Park Master Plan, City of Brampton.
- Three-season ecological surveys and assessments (breeding birds, vascular plants, vegetation community mapping).
 - Graphics, reporting.
- 2016 - 2020 Clair Maltby Secondary Plan Comprehensive Environmental Impact Study in the City of Guelph.
- Three-season ecological surveys and assessments (breeding birds, amphibians, reptiles, vascular plants, vegetation community mapping).
 - Graphics, reporting.

Natural Heritage Studies

- 2022 Eagle Heights Existing Conditions Report in the City of Burlington in support of the preparation of an Environmental Impact Assessment
- Three-season ecological surveys and assessments (amphibians, vascular plants, vegetation mapping, SAR surveys).
 - Graphics, reporting.
- 2021 Metrolinx Lakeshore East Rail Corridor Nesting Bird Surveys, City of Toronto.

Renewable Energy Infrastructure

- 2017- 2018 Nanticoke Solar Natural Heritage Assessment, Haldimand County.
- 2012 - 2014 Bluewater/Goshen/Jericho Wind Energy Centre Natural Heritage Assessments and Species at Risk Studies, Huron and Middlesex County.

Appendix 2. Representative Photographs



Photo 1. Southern reach, facing upstream (23 October 2020).



Photo 2. Southern reach, facing upstream (23 October 2020).



Photo 3. Southern reach, facing upstream (23 October 2020).



Photo 4. Southern reach, facing upstream (23 October 2020).



Photo 5. Medway Creek (facing north) (22 October 2021).



Photo 6. Dry – Fresh Graminoid Meadow (MEGM3) (27 June 2022).



Photo 7. Medway Creek (facing south) (22 October 2021).



Photo 8. Dry – Fresh Graminoid Meadow (MEGM3) (09 June 2022).



Photo 9. Agricultural field (27 June 2022).



Photo 10. Medway Creek facing north (09 June 2022).

Appendix 3. Vascular Plant List

Scientific Name	Common Name	Family	S-Rank (per NHIC)	Coefficient of Conservatism	Coefficient of Wetness
<i>Acer negundo</i>	Manitoba Maple	Aceraceae	S5	0	0
<i>Acer saccharinum</i>	Silver Maple	Aceraceae	S5	5	-3
<i>Acer x freemanii</i>	Freeman's Maple	Aceraceae	SNA	6	-5
<i>Achillea borealis var. borealis</i>	Woolly Yarrow	Asteraceae	S5	0	3
<i>Achillea millefolium</i>	Common Yarrow	Asteraceae	SNA	n/a	3
<i>Agrostis gigantea</i>	Redtop	Poaceae	SNA	n/a	-3
<i>Agrostis stolonifera</i>	Creeping Bentgrass	Poaceae	SNA	n/a	-3
<i>Alliaria petiolata</i>	Garlic Mustard	Brassicaceae	SNA	n/a	0
<i>Ambrosia trifida</i>	Great Ragweed	Asteraceae	S5	0	0
<i>Anemonastrum canadense</i>	Canada Anemone	Ranunculaceae	S5	3	-3
<i>Arctium minus</i>	Common Burdock	Asteraceae	SNA	n/a	3
<i>Aruncus dioicus</i>	Common Goatsbeard	Rosaceae	SNA	n/a	3
<i>Asclepias incarnata</i>	Swamp Milkweed	Asclepiadaceae	S5	6	-5
<i>Asclepias syriaca</i>	Common Milkweed	Asclepiadaceae	S5	0	5
<i>Bidens frondosa</i>	Devil's Beggarticks	Asteraceae	S5	3	-3
<i>Brassica rapa</i>	Field Mustard	Brassicaceae	SNA	n/a	5
<i>Bromus inermis</i>	Smooth Brome	Poaceae	SNA	n/a	5
<i>Calystegia sepium</i>	Hedge False Bindweed	Convolvulaceae	S5	2	0
<i>Carex granularis</i>	Limestone Meadow Sedge	Cyperaceae	S5	3	-3
<i>Carex spicata</i>	Spiked Sedge	Cyperaceae	SNA	n/a	3
<i>Cichorium intybus</i>	Chicory	Asteraceae	SNA	n/a	5
<i>Cirsium arvense</i>	Canada Thistle	Asteraceae	SNA	n/a	3
<i>Cirsium vulgare</i>	Bull Thistle	Asteraceae	SNA	n/a	3
<i>Convolvulus arvensis</i>	Field Bindweed	Convolvulaceae	SNA	n/a	5
<i>Corallorhiza maculata</i>	Spotted Coralroot	Orchidaceae	S5	7	3
<i>Cornus obliqua</i>	Pale Dogwood	Cornaceae	S5	2	-3
<i>Cornus racemosa</i>	Gray Dogwood	Cornaceae	S5	2	0
<i>Cornus sericea</i>	Red-osier Dogwood	Cornaceae	S5	2	-3
<i>Crataegus punctata</i>	Dotted Hawthorn	Rosaceae	S5	4	5
<i>Dactylis glomerata</i>	Orchard Grass	Poaceae	SNA	n/a	3
<i>Daucus carota</i>	Wild Carrot	Apiaceae	SNA	n/a	5
<i>Diphasiastrum complanatum</i>	Northern Ground-cedar	Lycopodiaceae	S5	5	3
<i>Dipsacus fullonum</i>	Common Teasel	Dipsacaceae	SNA	n/a	3
<i>Echinocystis lobata</i>	Wild Mock-cucumber	Cucurbitaceae	S5	3	-3
<i>Elymus repens</i>	Creeping Wildrye	Poaceae	SNA	n/a	3
<i>Equisetum arvense</i>	Field Horsetail	Equisetaceae	S5	0	0
<i>Erigeron annuus</i>	Annual Fleabane	Asteraceae	S5	0	3
<i>Festuca rubra</i>	Red Fescue	Poaceae	S5	0	3
<i>Fragaria virginiana</i>	Wild Strawberry	Rosaceae	S5	2	3
<i>Fraxinus pennsylvanica</i>	Green Ash	Oleaceae	S4	3	-3
<i>Galium mollugo</i>	Smooth Bedstraw	Rubiaceae	SNA	n/a	5
<i>Galium palustre</i>	Marsh Bedstraw	Rubiaceae	S5	5	-5
<i>Hesperis matronalis</i>	Dame's Rocket	Brassicaceae	SNA	n/a	3
<i>Hieracium vulgatum</i>	Common Hawkweed	Asteraceae	SNA	n/a	5
<i>Hypericum perforatum</i>	Common St. John's-wort	Clusiaceae	SNA	n/a	5
<i>Impatiens capensis</i>	Spotted Jewelweed	Balsaminaceae	S5	4	-3
<i>Inula helenicum</i>	Elecampane	Asteraceae	SNA	n/a	3

Scientific Name	Common Name	Family	S-Rank (per NHIC)	Coefficient of Conservatism	Coefficient of Wetness
<i>Iris versicolor</i>	Harlequin Blue Flag	Iridaceae	S5	5	-5
<i>Juniperus virginiana</i>	Eastern Red Cedar	Cupressaceae	S5	4	3
<i>Leucanthemum vulgare</i>	Oxeye Daisy	Asteraceae	SNA	n/a	5
<i>Linaria vulgaris</i>	Butter-and-eggs	Scrophulariaceae	SNA	n/a	5
<i>Lotus corniculatus</i>	Garden Bird's-foot Trefoil	Fabaceae	SNA	n/a	3
<i>Lysimachia ciliata</i>	Fringed Loosestrife	Primulaceae	S5	4	-3
<i>Malus pumila</i>	Common Apple	Rosaceae	SNA	n/a	5
<i>Medicago lupulina</i>	Black Medic	Fabaceae	SNA	n/a	3
<i>Melilotus albus</i>	White Sweet-clover	Fabaceae	SNA	n/a	3
<i>Morus alba</i>	White Mulberry	Moraceae	SNA	n/a	0
<i>Panicum capillare</i>	Common Panicgrass	Poaceae	S5	0	0
<i>Persicaria pensylvanica</i>	Pennsylvania Smartweed	Polygonaceae	S5	3	-3
<i>Phalaris arundinacea</i>	Reed Canary Grass	Poaceae	S5	0	-3
<i>Picea glauca</i>	White Spruce	Pinaceae	S5	6	3
<i>Plantago lanceolata</i>	English Plantain	Plantaginaceae	SNA	n/a	3
<i>Poa pratensis</i>	Kentucky Bluegrass	Poaceae	S5	0	3
<i>Prunella vulgaris</i>	Heal-all	Lamiaceae	S5	0	0
<i>Ranunculus acris</i>	Tall Buttercup	Ranunculaceae	SNA	n/a	0
<i>Rhamnus cathartica</i>	Common Buckthorn	Rhamnaceae	SNA	n/a	0
<i>Rumex crispus</i>	Curly Dock	Polygonaceae	SNA	n/a	0
<i>Salix eriocephala</i>	Heart-leaved Willow	Salicaceae	S5	4	-3
<i>Salix euicina</i>	Crack Willow	Salicaceae	SNA	n/a	0
<i>Salix interior</i>	Sandbar Willow	Salicaceae	S5	1	-3
<i>Salix petiolaris</i>	Meadow Willow	Salicaceae	S5	3	-3
<i>Schoenoplectus tabernaemontani</i>	Soft-stemmed Bulrush	Cyperaceae	S5	5	-5
<i>Schoenoplectus tabernaemontani</i>	Soft-stemmed Bulrush	Cyperaceae	S5	5	-5
<i>Securigera varia</i>	Common Crown-vetch	Fabaceae	SNA	n/a	5
<i>Silene vulgaris</i>	Bladder Champion	Caryophyllaceae	SNA	n/a	5
<i>Solidago altissima</i>	Tall Goldenrod	Asteraceae	S5	1	3
<i>Sonchus arvensis</i>	Field Sow-thistle	Asteraceae	SNA	n/a	3
<i>Stellaria media</i>	Common Chickweed	Caryophyllaceae	SNA	n/a	3
<i>Symphotrichum ericoides</i>	White Heath Aster	Asteraceae	S5	4	3
<i>Symphotrichum lanceolatum</i>	Panicled Aster	Asteraceae	S5	3	-3
<i>Symphotrichum novae-angliae</i>	New England Aster	Asteraceae	S5	2	-3
<i>Taraxacum officinale</i>	Common Dandelion	Asteraceae	SNA	n/a	3
<i>Trifolium pratense</i>	Red Clover	Fabaceae	SNA	n/a	3
<i>Urtica dioica</i>	Stinging Nettle	Urticaceae	S5	2	0
<i>Verbascum thapsus</i>	Common Mullein	Scrophulariaceae	SNA	n/a	5
<i>Verbena hastata</i>	Blue Vervain	Verbenaceae	S5	4	-3
<i>Veronica anagallis-aquatica</i>	Water Speedwell	Scrophulariaceae	SNA	n/a	-5
<i>Viburnum lentago</i>	Nannyberry	Caprifoliaceae	S5	4	0
<i>Vicia cracca</i>	Tufted Vetch	Fabaceae	SNA	n/a	5
<i>Vincetoxicum nigrum</i>	Black Swallow-wort	Asclepiadaceae	SNA	n/a	5
<i>Vitis riparia</i>	Riverbank Grape	Vitaceae	S5	0	0

Appendix 4. Breeding Bird Survey Results

Common Name	Scientific Name	Srank	SARO Status	SARA Status	Area Sensitive ³	Breeding Bird Stations ¹ and Breeding Status ²		
						BBS-1	BBS-2	BBS-3
Canada Goose	<i>Branta canadensis</i>	S5				Co		
Wood Duck	<i>Aix sponsa</i>	S5B, S3N					O	
Killdeer	<i>Charadrius vociferus</i>	S4B				Po		Po
Spotted Sandpiper	<i>Actitis macularius</i>	S5B				Po		
Great Blue Heron	<i>Ardea herodias</i>	S4						O
Belted Kingfisher	<i>Megasceryle alcyon</i>	S5B, S4N					O	
Eastern Kingbird	<i>Tyrannus tyrannus</i>	S4B				Po		
Willow Flycatcher	<i>Empidonax traillii</i>	S4B					Pr	Po
Horned Lark	<i>Eremophila alpestris</i>	S4					O	O
Bank Swallow	<i>Riparia riparia</i>	S4B	THR	THR			O	
Barn Swallow	<i>Hirundo rustica</i>	S4B	THR	THR		Fl		Fl
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>	S4S5B				Fl	Fl	
American Robin	<i>Turdus migratorius</i>	S5						Pr
European Starling	<i>Sturnus vulgaris</i>	SNA				Pr		
American Goldfinch	<i>Spinus tristis</i>	S5				Po		Po
Savannah Sparrow	<i>Passerculus sandwichensis</i>	S5B, S3N			x	Pr	Po	
Song Sparrow	<i>Melospiza melodia</i>	S5				Pr	Pr	Pr
Bobolink	<i>Dolichonyx oryzivorus</i>	S4B	THR	THR	x	O	O	
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	S5				Co	Co	Pr
Brown-headed Cowbird	<i>Molothrus ater</i>	S5				Po		Po
Common Grackle	<i>Quiscalus quiscula</i>	S5				Po	Po	
Common Yellowthroat	<i>Geothlypis trichas</i>	S5B, S3N					O	Po
Yellow Warbler	<i>Setophaga petechia</i>	S5B				Po		Po

1 - Locations of breeding bird survey stations are indicated on Figure 2.

2 - Co = Confirmed Breeder; Pr = Probable Breeder; Po = Possible Breeder; O = Observed (no evidence of breeding). Breeding status determined based on the results of the formal breeding bird surveys; where a higher level of breeding status was documented incidentally (i.e., during other field surveys), this is noted in within the main body of the report (where applicable).

3 - x = species considered to be Area Sensitive by the MNRFP per Appendix G - Table G-4 of the SWH Technical Guide.

Appendix 5. Results of UTRCA Electrofishing Survey

Results of UTRCA Electrofishing Survey

Sampling Conditions

Date	25-Aug-20
Current Weather	Sunny
Air Temp (°C)	25
Date of Last Rain	24-Aug-20
Rain Prev 7 Days (mm)	9
Start Time	9:00
End Time	12:30
# of Sampling Events	1
Samplers	MF DJ CV DJ
Gear	ETS Backpack Electrofisher
Quadrpulse On	Yes
Volts	200
Duty	30
Rate	300
Final -Volts	194
Final - Amps	2.21
Effort (seconds)	1,541

Water Chemistry

Water Temp (°C)	25.9
DO (%)	101.5
DO (mg/L)	8.25
Conductivity (mS/cm)	371.3
Total Diss. Solids	241.354
Salinity	0.18
pH	11.84
Turbidity	Cloudy
Turbidity NTU	76.8

Fish Captured

Species	Number	YOY Present
Largemouth Bass	76	Y
Common Carp	2	
Pumpkinseed	14	
Common Shiner	82	
Greenside Darter	56	

White Sucker	59	Y
Johnny Darter	4	
Bluntnose Minnow	52	
Creek Chub	55	
Central Stoneroller	83	
Blacknose Dace	10	
Black Bullhead	51	Y
Golden Shiner	23	
Hornyhead Chub	2	
Northern Pike	2	
Golden Redhorse	15	
Bluegill	1	
Yellow Perch	2	Y
Total	589	

Appendix 6. Significant Wildlife Habitat Assessment

Table 1. Results of the Significant Wildlife Habitat Assessment.

Ecoregion 6E	Do any Features, Habitats, or Areas on the Site or Adjacent Lands meet relevant criteria (Ecoregion 6E Criteria Schedule) as Candidate SWH?	Do any Features, Habitats, or Areas on the Site or Adjacent Lands meet relevant criteria (Ecoregion 6E Criteria Schedule) as Confirmed SWH?	Likelihood that Negative Effects to SWH (i.e., “degradation that threatens the health and integrity” as defined in the 2020 PPS) will occur based on the Proposed Development Plan and any related Site Alteration Activities.
Seasonal Concentration Areas of Animals			
Waterfowl Stopover and Staging Areas (Terrestrial)	No. Meadows, fields, and/or thickets that annually flood during spring and could support significant congregations of migrating waterfowl are absent.	--	--
Waterfowl Stopover and Staging Areas (Aquatic)	No. Large surface water features (e.g., ponds, lakes, bays, coastal inlets, large watercourses, etc.) and/or wetlands that annually flood during spring that could support significant congregations of migrating waterfowl are absent.	--	--
Shorebird Migratory Stopover Areas	No. Unvegetated open areas adjacent to surface water features (e.g., shorelines, beaches, mudflats, etc.) that could support significant congregations of migrating shorebirds are absent.	--	--
Raptor Wintering Areas	No. While meadow habitats are present on the Site with a treed area bordering the Site to the south, which may occasionally support wintering raptors, such habitats are too small to support significant congregations of wintering raptors.	--	--
Bat Hibernacula	No. Natural features and habitats that could support hibernating bats (e.g., caves, mine shafts, crevices, karsts, etc.) are absent from the Study Area.	--	--
Bat Maternity Colonies	No. Mature deciduous and mixed forests with a high-density trees containing cracks/cavities are absent from the Study Area.	--	--
Turtle Wintering Areas	No. Per the SWH Criteria Schedules for Ecoregion 6E man-made ponds and are not to be considered SWH.	--	--
Reptile Hibernaculum	No. Features (e.g., small mammal burrows, rock crevices, etc.) and/or habitats that could provide snakes with access below the frost line are absent from the Study Area.	--	--
Colonially - Nesting Bird Breeding Habitat (Bank and Cliff)	No. Per the SWH Criteria Schedules for Ecoregion 6E licensed/permitted Mineral Aggregate Operations are not to be considered SWH.	--	--
Colonially - Nesting Bird Breeding Habitat Breeding Habitat (Tree/Shrubs)	No. Swamps and fens that could support colonial nesting birds are absent.	--	--
Colonially - Nesting Bird Breeding Habitat (Ground)	No. Rocky islands or peninsulas along lakes or large rivers are absent.	--	--
Migratory Butterfly Stopover Areas	No. A mixture of fields and forests within 5 km from the shoreline of Lake Erie or Lake Ontario are absent	--	--
Landbird Migratory Stopover Areas	No. While migrating landbirds may temporarily stopover to feed and rest, the Subject Property is unlikely to support significant congregations of migrating landbirds.	--	--

Ecoregion 6E	Do any Features, Habitats, or Areas on the Site or Adjacent Lands meet relevant criteria (Ecoregion 6E Criteria Schedule) as Candidate SWH?	Do any Features, Habitats, or Areas on the Site or Adjacent Lands meet relevant criteria (Ecoregion 6E Criteria Schedule) as Confirmed SWH?	Likelihood that Negative Effects to SWH (i.e., “degradation that threatens the health and integrity” as defined in the 2020 PPS) will occur based on the Proposed Development Plan and any related Site Alteration Activities.
Deer Yarding Areas	No. MNRF has not identified any deer yarding areas and the Subject Property lacks vegetation communities that could provide thermal cover and lower snow depths in winter (e.g., coniferous woodlands and plantations, etc.).	--	--
Deer Winter Congregation Areas	No. See above.	--	--
Rare Vegetation Communities or Specialized Habitats for Wildlife			
Cliffs and Talus Slopes	No. Cliffs and talus slope communities are absent from the Study Area.	--	--
Sand Barren	No. Sand barren communities are absent from the Study Area.	--	--
Alvar	No. Alvar communities are absent from the Study Area.	--	--
Old Growth Forest	No. The small, wooded area south of the Site does not exhibit old-growth characteristics.	--	--
Savannah	No. Savannah communities are absent from the Study Area.	--	--
Tallgrass Prairie	No. Tallgrass Prairie communities are absent from the Study Area.	--	--
Other Rare Vegetation Community	No. Other provincially rare vegetation communities are absent from the Study Area.	--	--
Waterfowl Nesting Area	No. Waterfowl nesting areas are not present within the Study Area.	--	--
Bald Eagle and Osprey Nesting, Foraging and Perching Habitat	No. Forest communities adjacent to large surface water features are absent.	--	--
Woodland Raptor Nesting Habitat	No. Forest communities are not of sufficient size to support nesting raptors.	--	--
Turtle Nesting Areas	No. While exposed mineral soils adjacent to surface water features (i.e., aggregate ponds) are present, per the SWH Criteria Schedules for Ecoregion 6E man-made ponds and are not to be considered SWH. Based on this the exposed mineral soils should also not be considered SWH.	--	--
Seeps and Springs	No. Exposed mineral soil (sand or gravel) areas in or adjacent (<100 m) or within Marsh, Shallow Aquatic, Bog, or Fen communities are not present within the Study Area.	--	--
Amphibian Breeding Habitat (Woodland)	No. Forests with wetlands, ponds, and/or pools that may support significant congregations of breeding amphibians are absent.	--	--
Amphibian Breeding Habitat (Wetlands)	No. The aggregate ponds within the Study Area are man-made deep bodies of water that generally lack shrubs, logs, and emergent vegetation that are unlikely to support significant congregations of breeding amphibians are present	--	--

Ecoregion 6E	Do any Features, Habitats, or Areas on the Site or Adjacent Lands meet relevant criteria (Ecoregion 6E Criteria Schedule) as Candidate SWH?	Do any Features, Habitats, or Areas on the Site or Adjacent Lands meet relevant criteria (Ecoregion 6E Criteria Schedule) as Confirmed SWH?	Likelihood that Negative Effects to SWH (i.e., “degradation that threatens the health and integrity” as defined in the 2020 PPS) will occur based on the Proposed Development Plan and any related Site Alteration Activities.
Woodland Area-Sensitive Bird Breeding Habitat	No. Interior Forest interior conditions (i.e., >200 m from edge) are absent.	--	--
Habitat for Species of Conservation Concern			
Marsh Bird Breeding Habitat	No. Wetlands with shallow water and emergent aquatic vegetation are absent.	--	--
Open Country Bird Breeding Habitat	No. Meadow habitats of sufficient size are absent.	--	--
Shrub/Early Successional Bird Breeding Habitat	No. Shrub/early successional habitats of sufficient size are absent.	--	--
Terrestrial Crayfish	No. Marsh and swamp communities and/or wet fields are absent.	--	--
Special Concern and Rare Wildlife Species	Yes. See Table 2 below.	Yes. See Table 2 below.	Possible. See Table 2 below.
Animal Movement Corridors			
Amphibian Movement Corridors	No. No anuran movement corridors are present within the Study Area.	--	--
Deer Movement Corridors	No. As MNRF has not identified any Deer Yarding Areas, significant Deer Movement Corridors are by extension also absent.	--	--

Table 2. Results of the Special Concern and Provincially Rare Species Assessment.

Species	Status per O. Reg. 230/08 under the ESA and/or NHIC	Rationale for Consideration in this Study	General Description of Habitats and Features which the Species is Known to Occupy or Use within the Ecoregion in which this Study is Located	Likelihood that the Species Occupies the Area within or adjacent to proposed Development or Site Alteration ¹	Likelihood that Negative Effects to the Species or its Habitat (i.e., “degradation that threatens the health and integrity” as defined in the 2020 PPS) will occur based on the Proposed Development Plan and any related Site Alteration Activities.
Birds					
Bald Eagle <i>(Haliaeetus leucocephalus)</i>	SC	OBBA	<ul style="list-style-type: none"> Generally found feeding along waterbodies and shorelines, and adjacent deciduous and mixed forests. Super-canopy trees are used for nesting and roosting. <ul style="list-style-type: none"> Feeds largely on fish and carrion. 	Negligible. Suitable breeding habitat is absent; however, species may be seen flying overhead while foraging. Species not documented during breeding bird surveys.	--
Barn Swallow <i>(Hirundo rustica)</i>	SC	OBBA, eBird	<ul style="list-style-type: none"> Nests in barns, bridge/culvert undersides, awnings/overhangs on sides of buildings, and (historically) tree cavities. Forages in a variety of open areas including agricultural lands, meadows, prairies, woodland clearings, marshes, and above waterbodies. 	Negligible. While this species was observed foraging over the Site, suitable breeding sites within the Site is absent.	--
Eastern Wood-pewee <i>(Contopus virens)</i>	SC	OBBA	<ul style="list-style-type: none"> Breeds and forages in relatively open, deciduous and mixed forests of various sizes (including urban forest fragments) and along forest edges. 	Negligible. Suitable breeding habitat is absent from the Site. Species not documented during breeding bird surveys.	--
Wood Thrush <i>(Hylocichla mustelina)</i>	SC	OBBA, NHIC	<ul style="list-style-type: none"> Breeds and forages in second-growth and mature deciduous and mixed forests with a well-developed understory. 	Negligible. Suitable breeding habitat is absent from the Site. Species not documented during breeding bird surveys.	--
Fish					
Northern Sunfish <i>(Lepomis peltastes)</i>	SC	DFO Aquatic SAR map, iNaturalist	<ul style="list-style-type: none"> Occupies shallow, slow-moving vegetated rivers or warm water ponds with sandy or rocky substrates. 	Unlikely. No Northern Sunfish were captured within Medway Creek during electrofishing surveys completed by the UTRCA.	--
Insects					
American Bumble Bee <i>(Bombus pensylvanicus)</i>	SC	Species distribution and on-site habitats	<ul style="list-style-type: none"> Occupies a range of open areas with nectaring sites. Nests above ground in dense mats of long grasses but has also been known to nest in abandoned rodent burrows and bird nests high above the ground. 	Possible. Species is a habitat generalist and occupies a wide range of areas.	Negligible. As this species is a habitat generalist, following the restoration of the area associated with realigned Medway creek, the proposed extraction amendments will not result in a significant reduction of nectaring opportunities for this species within the landscape. Recommendations to include a native flower species within the area adjacent the realigned Medway Creek will also provide general nectaring habitat for bees and other insects. See report for greater details.
Monarch <i>(Danaus plexippus)</i>	SC	iNaturalist; Ontario Butterfly Atlas	<ul style="list-style-type: none"> Oviposits on Milkweeds (<i>Asclepias</i> spp.). Generalist foraging that nectars in most areas with wildflowers. 	Confirmed. This species was observed foraging on the Site.	Negligible. While Milkweed was identified within the Site, it was not overly abundant. Habitats within the Site do represent high-quality ovipositing sites and the proposed extraction amendments will not result in a significant reduction of ovipositing sites for this species within the landscape. Recommendations to include a native flower species within the area adjacent the

Species	Status per O. Reg. 230/08 under the ESA and/or NHIC	Rationale for Consideration in this Study	General Description of Habitats and Features which the Species is Known to Occupy or Use within the Ecoregion in which this Study is Located	Likelihood that the Species Occupies the Area within or adjacent to proposed Development or Site Alteration ¹	Likelihood that Negative Effects to the Species or its Habitat (i.e., “degradation that threatens the health and integrity” as defined in the 2020 PPS) will occur based on the Proposed Development Plan and any related Site Alteration Activities.
					realigned Medway Creek will also provide general nectaring and ovipositing habitat for bees and other insects. See report for greater details.
Yellow Banded Bumble Bee <i>(Bombus terricola)</i>	SC	Species distribution and on-site habitats	<ul style="list-style-type: none"> Occupies a range of open areas with nectaring sites. Nests underground in abandoned rodent burrows or decomposing logs. 	Possible. Species is a habitat generalist and occupies a wide range of areas.	Negligible. As this species is a habitat generalist, following the restoration of the area associated with realigned Medway creek, the proposed extraction amendments will not result in a significant reduction of nectaring opportunities for this species within the landscape. Recommendations to include a native flower species within the area adjacent the realigned Medway Creek will also provide general nectaring habitat for bees and other insects. See report for greater details.
Mussels					
Rainbow <i>(Cambarunio iris)</i>	SC	DFO Aquatic SAR map	<ul style="list-style-type: none"> Occupies small to medium sized rivers with moderate current with sand, rocky or gravel substrates. Typically found in riffles areas at the edges of vegetation, with less than 1m of water. 	Negligible. UTRCA completed a comprehensive survey of mussels of Medway Creek within the Site and did not identify this species. Terrastory also conducted a survey and did not identify this species.	--
Plants					
Great Plains Ladies'-tresses <i>(Spiranthes magnicamporum)</i>	S3?	iNaturalist	<ul style="list-style-type: none"> Occupies alvars or poorly drained soils and limited woody vegetation. 	Negligible. This species was not documented during vascular plant surveys.	--
Green Dragon <i>(Arisaema dracontium)</i>	SC	iNaturalist	<ul style="list-style-type: none"> Found in wet deciduous forests along streams. Prefers forests that are dominant with Maple, Red Ash or White Elm. 	Negligible. This species was not observed during vascular plant surveys.	--
Shining-branch Hawthorn <i>(Crataegus magniflora)</i>	S3	NHIC	<ul style="list-style-type: none"> Found in woodland margins, fencerows and overgrown pastures. 	Negligible. This species was not observed during vascular plant surveys.	--
Reptiles					

Species	Status per O. Reg. 230/08 under the ESA and/or NHIC	Rationale for Consideration in this Study	General Description of Habitats and Features which the Species is Known to Occupy or Use within the Ecoregion in which this Study is Located	Likelihood that the Species Occupies the Area within or adjacent to proposed Development or Site Alteration ¹	Likelihood that Negative Effects to the Species or its Habitat (i.e., “degradation that threatens the health and integrity” as defined in the 2020 PPS) will occur based on the Proposed Development Plan and any related Site Alteration Activities.
Northern Map Turtle (<i>Graptemys geographica</i>)	SC	iNaturalist	<ul style="list-style-type: none"> Occupies lakes and large rivers with slow moving currents. Nests in exposed, usually coarse, friable substrate. 	Negligible. Suitable habitat is absent from the Study Area.	--
Snapping Turtle (<i>Chelydra serpentina</i>)	SC	NHIC, Ontario Reptile and Amphibian Atlas	<ul style="list-style-type: none"> Occupies a variety of aquatic habitats with slow moving water. Nests in exposed, usually coarse, friable substrate. Known to make long-distance overland movements (i.e., several kilometers) between habitats. 	Possible. This species could occupy the aggregate ponds within the Study Area. It could also use Medway Creek as a corridor to migrate between other suitable habitats located outside the Study Area.	Negligible. The amendment to the extraction area will not negatively impact the existing aggregate ponds. Mitigation measures to protect turtles, should they happen to occur within Medway Creek corridor, at the time of relocation are provided within the report. See See report for greater details.

¹ Likelihood categories should be interpreted as follows:

Negligible: so limited that the assessed species can be assumed absent.

Unlikely: while theoretically conceivable, species presence very improbable or temporary based on available information (e.g., habitat conditions, range, abundance in local landscape, etc.).

Possible: species presence plausible based on available information; no convincing evidence suggesting species could not occur on-site.

Probable: while not confirmed, available information suggests species has a high likelihood of being present.

Confirmed: species observed and/or evidence of occupation (e.g., tracks, etc.) documented.

**Appendix 7. Endangered and Threatened Species
Assessment**

Species	Status per O. Reg. 230/08 of the ESA	Rationale for Consideration in this Study	General Description of Habitats and Features which the Species is Known to Occupy within the Ecoregion in which this Study is Located	Likelihood that the Species Occupies the Area within or adjacent to proposed Development or Site Alteration ¹	Likelihood that Negative Effects to the Species or its Habitat (i.e., “Damage” or “Destruction” as defined in the ESA) will occur based on the Proposed Development Plan and any related Site Alteration Activities
Birds					
Bank Swallow <i>(Riparia riparia)</i>	THR	OBBA	<ul style="list-style-type: none"> Nests in natural or anthropogenically derived exposed, sandy substrates on vertical or steep surfaces. Forages in a variety of open areas including agricultural lands, meadows, prairies, woodland clearings, marshes, and above waterbodies. 	Negligible. While This species was observed flying and foraging within the Study Area during breeding bird surveys, suitable breeding habitat is absent.	--
Bobolink <i>(Dolichonyx oryzivorus)</i>	THR	OBBA	<ul style="list-style-type: none"> Breeds and forages in hayfields, pastures, meadows, grasslands, and prairies which are often (but not always) greater 4 ha. May be found in more marginal habitats (e.g., shrubby fields, smaller fields, etc.) during migration or following disturbance to breeding habitats (e.g., hay cutting). 	Unlikely. A small flock of approximately ten (10) Bobolink were recorded during the third breeding bird survey. As this species was not detected during the first or second survey and were not displaying typical breeding behaviour (e.g. territorial calls, agitated behaviour, etc.) they are believed to have utilized the habitat on the Site as a temporary refuge for foraging and resting and not as a breeding habitat.	Negligible. A timing window restriction will be applied to vegetation removal activities to avoid impacting nesting birds. Lands adjacent to the realigned Medway Creek will be naturalized. This habitat will continue to serve as a temporary refute for foraging and resting. See report for greater details.
Eastern Meadowlark <i>(Sturnella magna)</i>	THR	NHIC, OBBA	<ul style="list-style-type: none"> Breeds and forages in hayfields, savannahs, pastures, meadows, grasslands, prairies, and shrubby fields. 	Negligible. Suitable breeding habitat is absent from the Study Area and this species was not identified during breeding bird surveys.	--
Red-headed Woodpecker <i>(Melanerpes erythrocephalus)</i>	END	OBBA, iNaturalist	<ul style="list-style-type: none"> Breeds and forages in deciduous forests and woodlots with large, mature trees with little understory with the presence of snags. 	Negligible. Suitable breeding habitat is absent from the Study Area and this species was not identified during breeding bird surveys.	--
Mammals					
Eastern Small-footed Myotis <i>(Myotis leibii)</i>	END	On-site habitats and distribution in southern Ontario.	<ul style="list-style-type: none"> Maternal roosting sites include exposed rock outcrops, crevices, and cliffs. Overwinters in caves and mines that maintain temperatures above 0°C. 	Negligible. While this species may forage above open habitats on the Site or Adjacent Lands, potential maternal roosting habitat (e.g., rock outcrops, cliffs, etc.) is absent.	--
Little Brown Myotis <i>(Myotis lucifugus)</i>	END	On-site habitats and distribution in southern Ontario.	<ul style="list-style-type: none"> Maternity roosts sites most often include buildings and large diameter trees with cracks, crevices, and/or exfoliating bark. Overwinters in caves and mines that maintain temperatures above 0°C. 	Unlikely. Given the size and species composition of the woodlands south of the Site, it’s unlikely that they provide significant maternity roost habitat for endangered bat species.	Negligible. The woodlands are located south of the Site and will not be affected by the amendment to the aggregate extraction area.
Northern Myotis <i>(Myotis septentrionalis)</i>	END	On-site habitats and distribution in southern Ontario.	<ul style="list-style-type: none"> Maternity roosts most often include large diameter trees with cracks, crevices, and/or exfoliating bark (buildings rarely used). Overwinters in caves and mines that maintain temperatures above 0°C. 	Unlikely. Given the size and species composition of the woodlands south of the Site, it’s unlikely that they provide significant maternity roost habitat for endangered bat species.	Negligible. The woodlands are located south of the Site and will not be affected by the amendment to the aggregate extraction area.
Tri-colored Bat <i>(Perimyotis subflavus)</i>	END	On-site habitats and distribution in southern Ontario.	<ul style="list-style-type: none"> Maternal roosting sites include Maple (<i>Acer</i> spp.) and Oak (<i>Quercus</i> spp.) with dead/dying leaf clusters. Overwinters in caves and mines that maintain temperatures above 0°C. 	Unlikely. Given the size and species composition of the woodlands south of the Site, it’s unlikely that they provide significant maternity roost habitat for endangered bat species.	Negligible. The woodlands are located south of the Site and will not be affected by the amendment to the aggregate extraction area.
Plants					
American Ginseng <i>(Panax quinquefolius)</i>	END	Known from Middlesex County,	<ul style="list-style-type: none"> Occupies rich, relatively undisturbed deciduous forests. 	Negligible. Species was not documented during vascular plant surveys.	--

Species	Status per O. Reg. 230/08 of the ESA	Rationale for Consideration in this Study	General Description of Habitats and Features which the Species is Known to Occupy within the Ecoregion in which this Study is Located	Likelihood that the Species Occupies the Area within or adjacent to proposed Development or Site Alteration ¹	Likelihood that Negative Effects to the Species or its Habitat (i.e., “Damage” or “Destruction” as defined in the ESA) will occur based on the Proposed Development Plan and any related Site Alteration Activities
		Critical SAR habitat database (federal)			
Black Ash <i>(Fraxinus nigra)</i>	END	Known from Middlesex County.	<ul style="list-style-type: none"> Occupies deciduous swamps (often peaty), floodplains, and wet woods. 	Negligible. Species was not documented during vascular plant surveys.	--
Butternut <i>(Juglans cinerea)</i>	END	Known from Middlesex County.	<ul style="list-style-type: none"> Occupies a variety of treed habitats including mature forests, early-successional forests, and hedgerows. 	Negligible. Species was not documented during vascular plant surveys.	--
Reptiles					
Spiny Softshell <i>(Apalone spinifera)</i>	END	iNaturalist (obscured record)	<ul style="list-style-type: none"> Occupies aquatic habitats (rivers, lakes, creeks and ponds near rivers) and rarely leaves aquatic habitat. Requires open sand or gravel nesting areas, deep pools for hibernation and areas nearby for basking. 	Negligible. The majority of Spiny Softshell turtles are found in two major river systems near London, Ontario; one of which is located approximately 24 km east of the Site. Although this species is known to travel long distances, in some cases up to 30 km in one year within interconnected aquatic habitat; Medway Creek is not connected to the species’ known aquatic habitat, therefore likelihood of presence is considered negligible.	--

¹ Likelihood categories are to be interpreted as follows:

Negligible: so limited that the assessed species can be assumed absent.

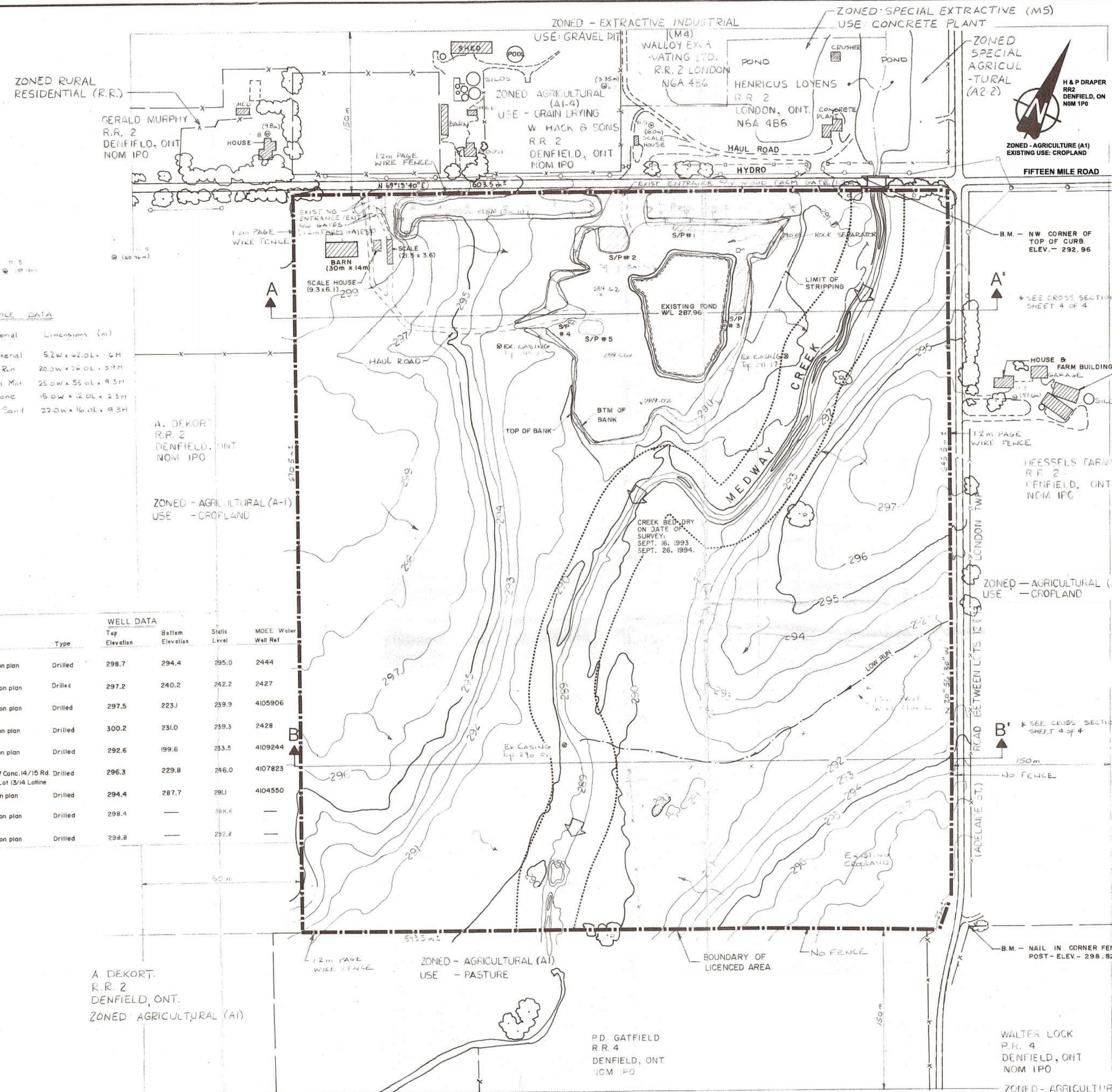
Low/Unlikely: while theoretically conceivable, species presence very improbable or temporary based on available information (e.g., habitat conditions, range, abundance in local landscape, etc.).

Possible: species presence plausible based on available information; no convincing evidence suggesting species could not occur on-site.

Probable: while not confirmed, available information suggests species has a high likelihood of being present.

Confirmed: species observed and/or evidence of occupation (e.g., tracks, etc.) documented.

Appendix 8. Site Plans



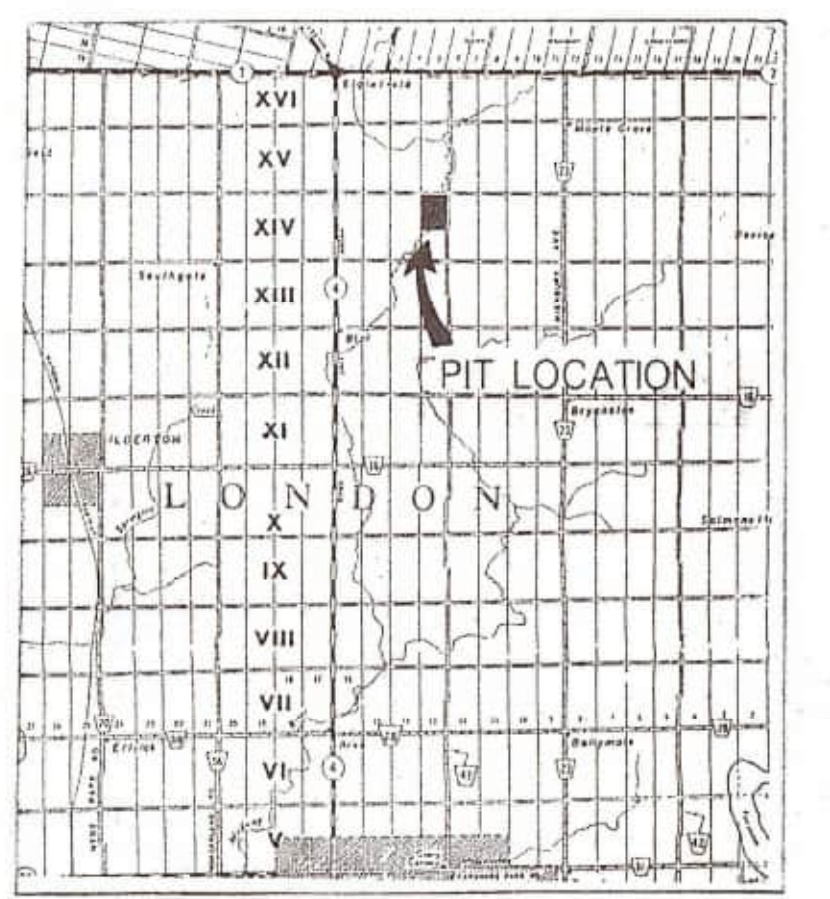
STOCKPILE DATA

No.	Material	Dimensions (m)
1	Pit Material	52W x 62.0L x 1.6H
2	6" #4 R.R.	20.0W x 30.0L x 3.9H
3	Excavator Mat	25.0W x 55.0L x 9.3H
4	Clear Stone	15.0W x 12.0L x 2.3H
5	Bedding Sand	22.0W x 16.0L x 9.3H

WELL DATA

No.	Location	Type	Top Elevation	Bottom Elevation	Static Level	MOEE Well Ref
1	As shown on plan	Drilled	298.7	294.4	295.0	2444
2	As shown on plan	Drilled	297.2	240.2	242.2	2427
3	As shown on plan	Drilled	297.5	223.1	239.9	4105906
4	As shown on plan	Drilled	300.2	231.0	239.3	2428
5	As shown on plan	Drilled	292.6	199.6	233.5	4109244
6	240 m N. of Conc. 14/15 Rd. 46 m E. of Lot 13/14 Lotline	Drilled	296.3	229.8	246.0	4107823
7	As shown on plan	Drilled	294.4	287.7	291.1	4104550
8	As shown on plan	Drilled	298.4	—	288.5	—
9	As shown on plan	Drilled	298.8	—	292.8	—

- GENERAL NOTES**
- SITE PLANS**
THIS SITE PLAN WAS PREPARED FOR SUBMISSION TO THE MINISTRY OF NATURAL RESOURCES AND FORESTRY IN CONJUNCTION WITH A CLASS A LICENCE UPDATE UNDER THE AGGREGATE RESOURCES ACT.
 - LICENSEE:**
McCANN REDI-MIX
69478 Bronson Line
R.R.#3
Dashwood, Ontario
 - TOPOGRAPHY**
THE TOPOGRAPHY OF THE EXISTING SITE WAS DETERMINED FROM MNR 1978 PHOTOGRAPHY AND FIELD SURVEYS COMPLETED IN APRIL, 1987 AND SEPTEMBER, 1987 BY HURON-MIDDLESEX ENGINEERING LTD. THE 1978 DETAIL WAS REVISED TO REFLECT PRESENT CONDITIONS. ALL EXISTING DETAIL WITHIN 150m OF THE PIT BOUNDARY ARE SHOWN.
 - ELEVATIONS**
ALL ELEVATIONS AND CONTOURS SHOWN ARE GEODETIC AND ARE REFERENCED TO THE BENCHMARK # 76-8067 (BRASS CAPPED ROD, EAST SIDE OF HWY 4, 7 km NORTH OF CONCESSION ROAD 13, APPROX 90m SOUTH OF DRIVEWAY).
 - LICENCE AREA**
AREA OF LICENCE: 40.5 HA
AREA TO BE EXTRACTED: 28.7 HA
PREVIOUSLY DISTURBED AREA: 4.0 HA
 - ZONING**
THE OWNERSHIP, ZONING, AND USE OF THE ADJACENT PROPERTIES IS AS NOTED. THE PRESENT ZONING OF THE SITE IS EXTRACTIVE INDUSTRIAL (M4) WHICH ALLOWS USE AS A GRAVEL PIT.
 - RESTRICTED AREA (ZONING) BY-LAW No. 5900 OF THE FORMER TOWNSHIP OF LONDON WAS DATED SEPTEMBER, 1980.**
 - BUILDINGS**
THE EXISTING BARN ON THE SITE SHALL REMAIN AND SHALL BE USED FOR AN ACCESSORY USE TO THE EXTRACTION OPERATIONS.
 - FENCING**
ALL BOUNDARIES ARE PRESENTLY FENCED AND IN ACCORDANCE WITH THE ACT WITH THE EXCEPTION OF THE SOUTHEAST CORNER OF THE SITE.
 - WATER LEVEL**
GROUNDWATER ELEVATION VARIES ACROSS THE SITE FROM 285.95 TO 290.96 m ASL DURING THE HYDROLOGIC HIGH PER HYDROGEOLOGICAL REPORT BY NOVATERRA ENVIRONMENTAL LTD., DATED APRIL 2024.
 - SOILS INFORMATION**
SOILS INFORMATION IS CONTAINED IN A CONFIDENTIAL "REPORT OF SOILS INVESTIGATION TO APPRAISE DEPOSIT, LOT 13, CONCESSION 14, TOWNSHIP OF LONDON", PREPARED BY ATKINSON DAVIES INC., CONSULTING ENGINEERS, REF. 1-0855, DATED AUGUST 31, 1987.
 - REFERENCES**
HYDROGEOLOGICAL ASSESSMENT BY NOVATERRA ENVIRONMENTAL LTD., DATED JUNE 2024
NATURAL ENVIRONMENT ASSESSMENT BY TERRASTORY ENVIRONMENTAL CONSULTING INC., DATED JUNE 2024
MEDWAY CREEK CHANNEL REALIGNMENT DESIGN BRIEF DATED APRIL 2024 AND STANLEY PIT NATURAL CHANNEL RELOCATION DRAWINGS DATED MAY 3, 2024 BY GRECK AND ASSOCIATES LTD.
DEPARTMENT OF FISHERIES AND OCEANS LETTER, DATED DECEMBER 11, 2023.



- KEY PLAN**
SCALE 1 : 200 000
LICENCE No. 2191
- LEGEND**
- LOT AND CONCESSION LINES
 - SPOT ELEVATION
 - CONTOUR LINES
 - EXISTING DITCH
 - EXISTING PIT FACES
 - OPEN DITCH
 - FENCE
 - ENTRANCE & EXIT GATE
 - MUNICIPAL ROADS
 - OTHER ROADS (PRIVATE)
 - EXISTING TREES/BUSH (D-DECIDUOUS) (C-CONIFEROUS)
 - EXISTING BUILDING & STRUCTURES
 - BOUNDARY OF LICENCE AREA
 - LOCATION OF WATER MONITORING PLECOMETERS
 - WELL (DEPTH TO WATER TABLE)
 - UTILITY POLE AND WELL No.
 - STOCK PILE
 - LOW RUN
 - SURFACE DRAINAGE PATTERN
 - U.T.R.C.A. REG. FILL LINES

HM AMENDMENT BOX

No.	Revision	Date	Initial
1.	UPDATED LICENSEE INFORMATION AND LEDGIBILITY OF PLAN, UPDATED HYDROGEOLOGICAL INFORMATION.	JULY 2024	SB

Revisions made by Harrington McAvan Ltd. dating from FEB 2024 only.

Harrington McAvan Ltd.
41 Main Street, Unit 102
Uxbridge, Ontario L2R 2E5
Tel: 905-294-8262 Fax: 905-294-7823
www.harringtonmcavan.com

Stamp: ASSOCIATION OF LANDSCAPE ARCHITECTS OF ONTARIO (L.A.S.O.) MEMBER

SITE PLAN AMENDMENTS

NO	DESCRIPTION	DATE	BY
1	DESIGNED: RTM		
2	DRAWN: CAH/RTM		
3	CHECKED: RTM		
4	APPROVED: DWP		
5	DATE: 23 DEC 1981		

Huron-Middlesex Engineering Ltd.
ORIGINAL PLAN STAMPED BY D.W. PLETCH

McCANN REDI-MIX
69478 Bronson Line
R.R.#3
Dashwood, Ontario

SCALE
1 : 2000

EXISTING FEATURES
STANLEY PIT
NORTH HALF LOT, 13, CONCESSION 14
MUNICIPALITY OF MIDDLESEX CENTRE
(FORMERLY TOWNSHIP OF LONDON),
COUNTY OF MIDDLESEX

PROJECT NO.
93-16
SHEET NO.
1 OF 4
PLAN FILE NO.
0CT 25 1994

SPILLS PLAN
In case of an accidental spill of petroleum products, the following contingency plan will be activated:

- The Ministry of Environment (See address & phone number below) and surrounding landowners will be notified.
- For a leakage or spill immediate action will be taken to stop it. At the same time measures will be taken to prevent spreading. These measures may include building or a berm or construction of a ditch, for instance.
- The pit operator shall commence recovery procedures by collecting the spilled substance into containers.
- The soil in the area affected by the spill or leak shall be removed and disposed of at a location prescribed by the Ministry of the Environment.

Ministry of Environment/Southwest Regional Office
733 Exeter Road, 2nd Floor
London, Ontario, N6E 1L3
Spills Action Centre: 1-800-268-6060

SITE PLAN OVERRIDES UNDER OPERATIONAL STANDARDS

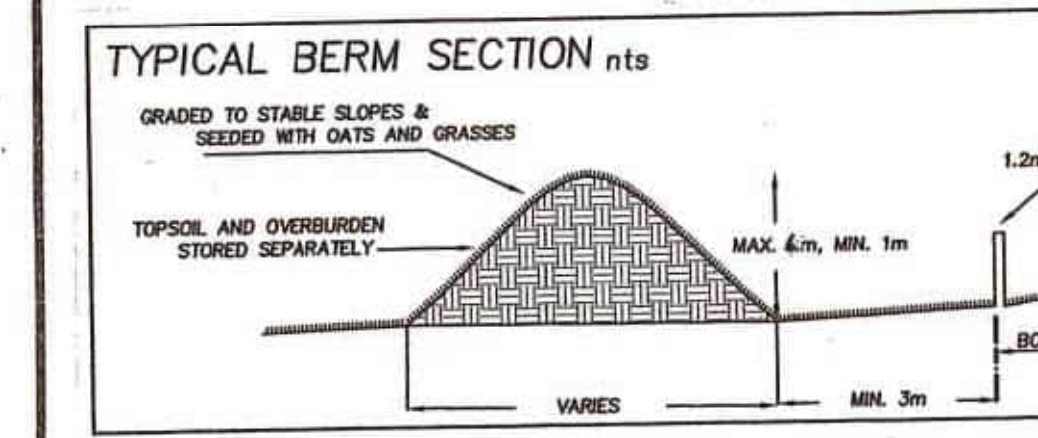
DESCRIPTION	SECTION
FENCING ON THE EAST PART OF THE SOUTH BOUNDARY AS PER LANDOWNER AGREEMENT ON FILE WITH MNR	5.1
BELOW WATER SLOPES AND SHORELINE ZONES MAY VARY FROM 1:1 TO 10:1	5.19.1
EAST BOUNDARY FENCE MAY BE LOCATED INSIDE THE ACTUAL BOUNDARY	5.1
NORTH SETBACK REDUCED TO 15m	5.10.2.1

LEGEND

- LOT AND CONCESSION LINES
- UTRA REGULATORY FILL LINE
- APPROXIMATE LIMIT OF DEPOSIT
- FENCE
- ENTRANCE & EXIT GATE
- MUNICIPAL ROADS
- OTHER ROADS (PRIVATE)
- EXISTING TREES/BUSH (D-DECIDUOUS) (S-CONIFEROUS)
- EXISTING BUILDING & STRUCTURES
- BOUNDARY OF LICENSED AREA
- LIMITS OF EXTRACTION
- EXTRACTION SLOPES
- UTILITY POLES
- BELOW WATER EXTRACTION AREA

DIRECTION OF ABOVE WATER EXTRACTION
DIRECTION OF BELOW WATER EXTRACTION

288.3 MAXIMUM DEPTH OF ABOVE WATER EXTRACTION
282.0 MAXIMUM DEPTH OF BELOW WATER EXTRACTION



HM AMENDMENT BOX

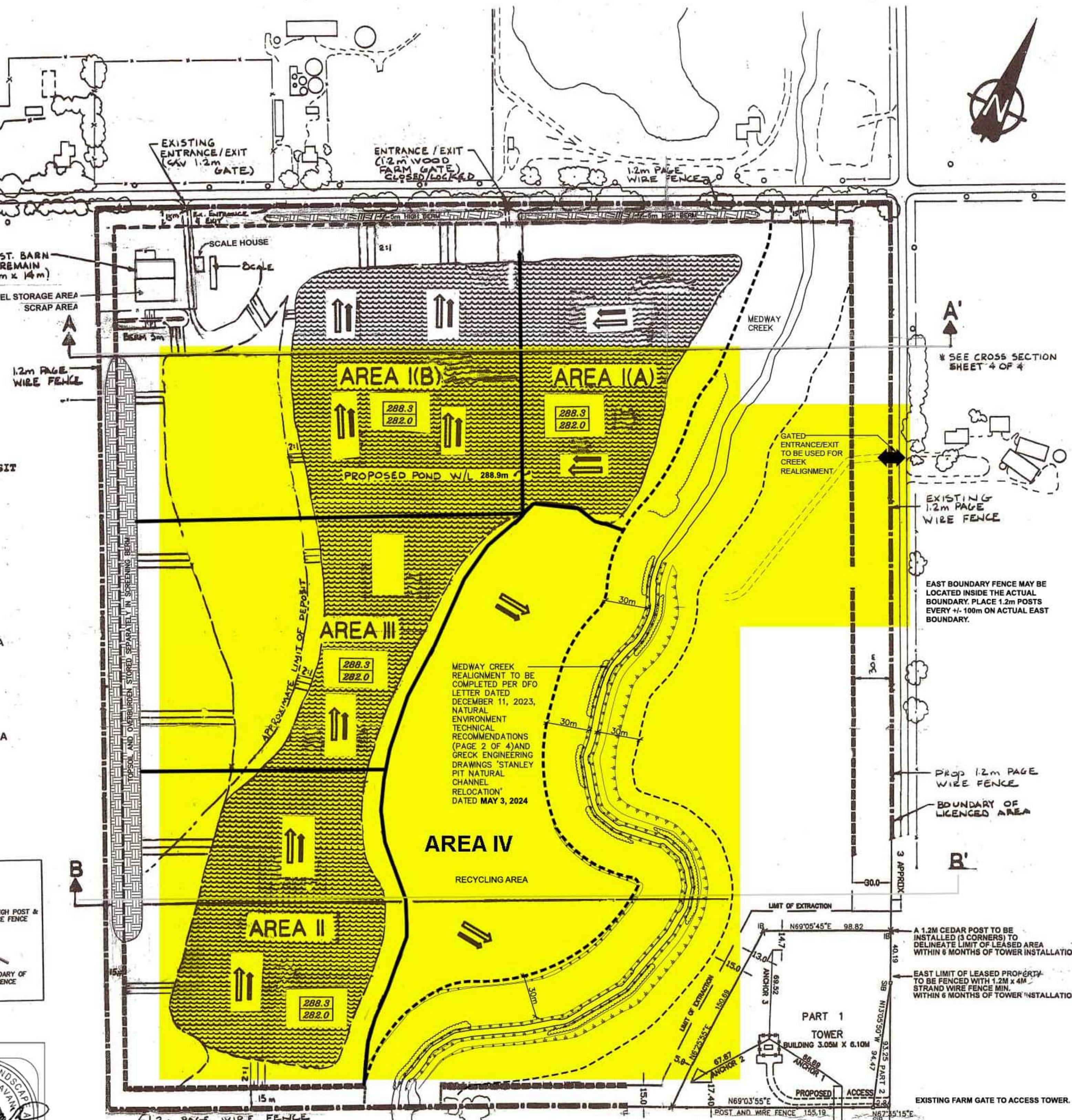
No.	Revision	Date	Initial
1	UPDATED TO SHOW REALIGNMENT OF MEDWAY CREEK AND EXTRACTION IN AREA 4	JULY 2024	SE

Revisions made by Harrington McAvan Ltd. dating from FEB. 2024 only.

Harrington McAvan Ltd.
41 Main Street, Unit 102
London, Ontario, N6A 1G3
Tel: 519-294-4022 Fax: 519-294-7623
www.harringtonmccann.com

DESIGNED	NO.	SITE PLAN AMENDMENTS	DATE	BY
DESIGNED: RJM	1	REVISED AS PER MNR	7 JAN 2024	RJM
DRAWN: RJM/ICM	2	MARKUP OF 6 JAN. 1968		
CHECKED: RJM	2	REVISIONS AS REQUESTED	13 APR. 2024	RJM
APPROVED: DWP		BY MNR		
DATE: 23 DEC. 1968	3	UPDATE PIT TO EXIST. CONDITIONS	18 DEC. 2023	RJM
	4	REVISED AS PER MNR		
	5	MARKUP OF 26 JUNE 1994	04 DEC. 2023	RJM
	6	ADDED TOWER & BERM NOTES	01 FEB. 2024	RJM

No.	AMENDMENT	DATE
6	NORTH SETBACK REDUCED TO 15m; BELOW WATER SLOPES & SHORELINE ZONES; DRY HYDRANT; EAST BOUNDARY FENCING OVERRIDE.	SEPT 2006
7	CHANGE PHASING AND DIRECTION OF EXTRACTION FOR AREAS II AND III; ADD SCRAP AREA. ADD FUEL STORAGE AREA; ADD BERM TO WEST SETBACK; ADD BERM DETAIL; ADD SPILLS PLAN	AUG 2012



TECHNICAL RECOMMENDATIONS

NATURAL ENVIRONMENT REPORT BY TERRASTORY ENVIRONMENTAL CONSULTING, DATED JULY 2024

SIGNIFICANT WILDLIFE HABITAT

- NATIVE WILDFLOWERS AND MILKWEED SPECIES WILL BE INCLUDED AS PART OF THE SEED MIX FOR THE REALIGNED MEDWAY CREEK RIPARIAN AREA.
- A SURVEY FOR TURTLES WILL BE UNDERTAKEN CONCURRENTLY WITH THE FISH RESCUE PRIOR TO REALIGNMENT OF MEDWAY CREEK UNDER THE AUTHORITY OF A WILDLIFE SCIENTIFIC COLLECTOR'S AUTHORIZATION ISSUED BY MNR.
- ANY TURTLES ENCOUNTERED WILL BE RELOCATED TO SUITABLE HABITAT UPSTREAM OR DOWNSTREAM OF THE MEDWAY CREEK REALIGNMENT AREA.

HABITAT OF SPECIES AT RISK AND OTHER WILDLIFE

- ALL AGGREGATE OPERATIONS WITHIN THE SITE WILL BE UNDERTAKEN CONSISTENT WITH THE DOCUMENT TITLED "BEST MANAGEMENT PRACTICES FOR THE PROTECTION, CREATION AND MAINTENANCE OF BANK SWALLOW HABITAT IN ONTARIO" (OMNRF 2017).
- ANY NECESSARY REMOVAL OF NATURAL VEGETATION TO SUPPORT PIT OPERATIONS WILL BE COMPLETED OUTSIDE THE PRIMARY BIRD NESTING AND BAT ACTIVITY PERIODS (I.E. TO BE COMPLETED BETWEEN OCTOBER 1 AND MARCH 31).

MEDWAY CREEK REALIGNMENT AND FISH HABITAT

- ALL EXTRACTION, OPERATIONAL ACTIVITIES AND DISTURBANCES WILL BE SET BACK A MINIMUM OF 30m FROM THE REALIGNED CHANNEL BANKS OF MEDWAY CREEK.
- THE 30m SETBACK AREAS WILL BE SEEDED AND PLANTED CONSISTENT WITH THE NATURAL CHANNEL RELOCATION PLAN (CREEK AND ASSOCIATES) AND WILL BE TREATED AS NATURAL, SELF-SUSTAINING VEGETATION (NO MOW OR AGRICULTURAL USES).
- ALL FISH AND MUSSEL SPECIES WILL BE RELOCATED DOWNSTREAM AND IMMEDIATELY PRIOR TO REDIRECTION OF FLOWS TO THE NEW CHANNEL OF MEDWAY CREEK UNDER THE AUTHORITY OF A LICENCE TO COLLECT FISH FOR SCIENTIFIC PURPOSES ISSUED BY MNR.
- ALL MEASURES RECOMMENDED BY DFO PER THEIR 11 DECEMBER 2023 LETTER OF ADVICE WILL BE IMPLEMENTED AS PART OF REALIGNING MEDWAY CREEK.

SEQUENCE OF OPERATIONS CONTINUED

AREA IV

- CONSTRUCT FENCING AND INSTALL GATE ON EAST LICENCE BOUNDARY FOR MEDWAY CREEK REALIGNMENT.
- STRIP AREA IV AND STOCKPILE TOPSOIL AND OVERBURDEN SEPARATELY ALONG THE SOUTH SETBACK.
- INITIATE ABOVE WATER EXTRACTION IN DIRECTION SHOWN TO ELEVATION 288.3m A.S.L.
- PRIOR TO COMPLETING ABOVE WATER EXTRACTION IN AREA IV, INITIATE BELOW WATER EXTRACTION IN DIRECTION SHOWN TO ELEVATION 282m A.S.L. OR 4m BELOW WATER.
- COMPLETE BELOW WATER EXTRACTION AND COMPLETE REHABILITATION USING MATERIAL STORED IN BERMS.

GENERAL NOTES

STAGING

- REHABILITATION SHALL PROCEED IN EACH AREA UPON COMPLETION OF EXTRACTION OPERATIONS AS OUTLINED ON PAGE 2 OF 4.
- GRADING/SLOPES
THE FINAL GRADING ELEVATIONS SHALL BE IN GENERAL CONFORMANCE WITH THE ELEVATIONS SHOWN ON THE PLAN.
ALL SIDE SLOPES SHALL BE GRADED TO A MINIMUM OF 3:1 ABOVE WATER TABLE, ESTABLISHED BY BACKFILLING AND 2:1 BELOW WATER LEVEL, ESTABLISHED BY EXTRACTION.
EXTRACTION SLOPES SHALL BE 2:1 UNLESS OTHERWISE NOTED.
A MINIMUM DEPTH OF 850mm OF SUBSOIL AND/OR OVERBURDEN SHALL BE SPREAD UNIFORMLY OVER EACH REHABILITATED AREA.
- SOIL MANAGEMENT
WHERE COMPACTION OF THE PIT FLOOR HAS OCCURRED, DEEP RIPPING (SUB-SOILING) WILL BE REQUIRED PRIOR TO REAPPLICATION OF THE SUBSOIL AND TOPSOIL TO ALLOW DRAINAGE AND AERATION ACCORDANCE WITH ACCEPTED FARMING PRACTICES.
UPON COMPLETION OF REPLACING TOPSOIL IN EACH AREA, THE TOPSOIL SHALL BE CULTIVATED, FERTILIZED AND SEEDED WITH A GRASS/LEGUME MIXTURE CONTAINING ALFALFA, BIRDS-FOOT TREFOIL, AND/OR CLOVERS.
- ZONING AND FINAL LAND USE
THE ZONING OF THE EXISTING SITE ALLOWS AREAS II AND IV TO BE USED FOR AGRICULTURE UPON COMPLETION OF REHABILITATION.
AREAS I AND III SHALL BE REZONED TO ALLOW USE OF THE REMAINING POND IN THIS AREA AS A FISH HATCHERY. THE POND MAY ALSO BE USED FOR RECREATIONAL AND IRRIGATION PURPOSES.
- REHABILITATION AREAS
REHABILITATION SHALL BE IN GENERAL CONFORMANCE TO WHAT IS SHOWN ON PAGE 3 OF 4.
THE AREA TO BE REHABILITATED IS +/- 28.7 ha AND THE TOTAL LENGTH OF OPERATION IS ESTIMATED TO BE 19-20 YEARS (DEPENDENT ON ECONOMIC CONDITIONS).
FARMING OPERATIONS SHALL CONTINUE IN THOSE AREAS NOT UNDER EXTRACTION OPERATIONS AND IN AREAS REHABILITATED.
UPON COMMENCING EXTRACTION, TOPSOIL AND SUBSOIL SHALL BE TEMPORARILY STOCKPILED SEPARATELY FOR REHABILITATION USE, OR CONSTRUCTION OF BERMS.
- DRAINAGE
SURFACE DRAINAGE SHALL CONFORM TO THE FINAL CONTOURS OF THE PIT FLOOR AS SHOWN ON PAGE 3 OF 4. DRAINAGE SHALL BE DIRECTED TO THE POND OR THROUGH THE PIT FLOOR.
THE WEST SIDE OF THE SITE DRAINS TOWARD THE POND AND AWAY FROM MEDWAY CREEK.
- PETROLEUM STORAGE
ALL PETROLEUM STORAGE SHALL BE IN ABOVE GROUND CONTAINERS THAT MEET THE REQUIREMENTS OF THE TECHNICAL STANDARDS AND SAFETY ACT. ANY SPILLS SHALL BE REMOVED AND DISPOSED OF AT A FACILITY APPROVED BY THE MECP. SEE THE SPILLS PLAN ON THIS PAGE. MOBILE FUEL TANKS SHALL BE THE NEW GENERATION ENGINEERED DOUBLE-TANKED VARIETY WITH VACUUM SEALED VALVES.
- NOISE AND DUST AND GROUNDWATER INTERFERENCE DUST CONTROL SHALL BE APPLIED AS REQUIRED, AT EACH ENTRANCE/EXIT AND HAUL ROAD (CALCIUM CHLORIDE OR BRINE SOLUTION).
IF NOISE, DUST AND/OR GROUNDWATER INTERFERENCE COMPLAINTS ARE RECEIVED FROM THE SURROUNDING RESIDENCES, THE LICENSEE SHALL TAKE APPROPRIATE MEASURES AS DEEMED NECESSARY BY THE MECP TO RECTIFY THE PROBLEMS.
- PUMPING AND DEWATERING
NO PUMPING AND DEWATERING SHALL TAKE PLACE ON THIS SITE.
- HYDROGEOLOGICAL ASSESSMENT
NOVATERRA ENVIRONMENTAL LTD., DATED APRIL 2024.
- TOPSOIL/SUBSOIL/OVERBURDEN STORAGE AND BERMS
ALL TOPSOIL, SUBSOIL, AND OVERBURDEN SHALL BE SEPARATELY STRIPPED AND USED EITHER FOR BERM CONSTRUCTION IN THE SETBACK AREAS OR STOCKPILED FOR PROGRESSIVE REHABILITATION. ALL TOPSOIL, SUBSOIL, AND OVERBURDEN STOCKPILES SHALL BE A MAXIMUM 6m IN HEIGHT GRADED TO STABLE SLOPES, AND SEEDED TO PREVENT EROSION. ALL TOPSOIL AND SUBSOIL, STRIPPED IN THE OPERATION OF THE SITE SHALL BE USED IN THE REHABILITATION OF THE PROPERTY. SEE "TYPICAL BERM DETAIL" THIS PAGE.
- AGGREGATE STOCKPILES AND PROCESSING EQUIPMENT NO AGGREGATE STOCKPILERS OR PROCESSING EQUIPMENT SHALL BE LOCATED WITHIN 30m OF ANY LICENCE BOUNDARY. AGGREGATE STOCKPILES SHALL FOLLOW THE ACTIVE PIT FACE AND BE A MAXIMUM OF 10m IN HEIGHT.
PORTABLE DRY SCREENING EQUIPMENT WILL BE USED ON THIS SITE. EXCAVATION ABOVE THE WATER TABLE WILL BE WITH A LOADER, TANDEM AND SINGLE AXLE TRUCKS WILL TRANSPORT MATERIAL OFF SITE. DREDGING WILL BE WITH A BACKHOE OR DRAGLINE.
- MAINTENANCE OF VEGETATION
VEGETATION SHALL BE MAINTAINED ON ALL REHABILITATED AREAS, BERMS, TOPSOIL AND SUBSOIL PILES. ANY VEGETATION THAT DIES OR IS OTHERWISE DAMAGED SHALL BE REPLACED IN ORDER TO PREVENT EROSION.
- SCRAP STORAGE
ALL SCRAP ON THE SITE SHALL BE COLLECTED AND STORED IN THE DESIGNATED AREA SHOWN. LOCATED A MINIMUM OF 30m FROM ANY LICENSED BOUNDARY. ALL SCRAP SHALL BE REMOVED FROM THE SITE ON AN ONGOING BASIS.
- IMPORTATION OF MATERIALS FOR RECYCLING AND REHABILITATION
MATERIALS MAY BE RECYCLING OF MATERIAL (ASPHALT AND CONCRETE) ON THIS SITE. MATERIAL IMPORTED FOR RECYCLING WILL BE STORED IN SEGREGATED STOCKPILES IN AREA 4. RECYCLABLE ASPHALT MATERIALS WILL NOT BE STOCKPILED WITHIN 30m OF ANY WATERBODY OR MAN-MADE POND, OR 2M OF THE SURFACE OF THE ESTABLISHED WATER TABLE. ANY REBAR AND OTHER STRUCTURAL METAL MUST BE REMOVED FROM THE RECYCLED MATERIAL DURING PROCESSING AND PLACED IN A DESIGNATED SCRAP PILE ON SITE WHICH WILL BE REMOVED ON AN ONGOING BASIS. REMOVAL OF RECYCLED AGGREGATE IS TO BE ONGOING. ONCE THE AGGREGATE ON SITE HAS BEEN DEPLETED THERE WILL BE NO FURTHER IMPORTATION OF RECYCLED MATERIALS PERMITTED. ONCE FINAL REHABILITATION HAS BEEN COMPLETED AND APPROVED IN ACCORDANCE WITH THE SITE PLAN, ALL RECYCLING OPERATIONS MUST CEASE.

STUMPS AND BRUSH MAY BE IMPORTED FOR USE IN REHABILITATION AS SHOWN ON PAGE 3 OF 4.

SEQUENCE OF OPERATIONS

AREA IB

- PRIOR TO COMPLETING EXTRACTION OF AREA IA, STRIP AREA IB AND USE TOPSOIL AND OVERBURDEN TO COMPLETE CONSTRUCTION OF BERM ALONG NORTH BOUNDARY.
- SURPLUS TOPSOIL AND OVERBURDEN TO BE STOCKPILED IN AREA IB FOR FUTURE REHABILITATION OR PROGRESSIVE REHABILITATION IN AREA IA.
- CONTINUE EXTRACTION IN DIRECTION SHOWN TO ELEVATION 288.30m A.S.L. OR 0.3m ABOVE WATER.
- AS EXTRACTION APPROACHES THE NORTH, WEST AND EAST LIMITS EXTRACTION, INITIATE PROGRESSIVE REHABILITATION OF THE SIDE SLOPES USING STOCKPILED TOPSOIL AND OVERBURDEN.
- PRIOR TO COMPLETION OF EXTRACTION ABOVE WATER IN AREA IB, EXTRACTION BELOW WATER IN DIRECTION SHOWN TO ELEVATION 282m A.S.L. OR 6m BELOW WATER.
- AS EXTRACTION APPROACHES THE NORTH AND WEST LIMITS EXTRACTION, INITIATE PROGRESSIVE REHABILITATION OF THE SIDE SLOPES USING STOCKPILED TOPSOIL AND OVERBURDEN.
- COMPLETE REHABILITATION OF AREA IB USING TOPSOIL AND OVERBURDEN CONTAINED WITHIN BERM LOCATED ALONG WEST BOUNDARY.

AREA II

- NOTE 1 REMOVED
- STRIP AREA II AND STOCKPILE TOPSOIL AND OVERBURDEN IN THE WEST SETBACK FOR FUTURE PROGRESSIVE REHABILITATION.
- INITIATE EXTRACTION IN DIRECTION SHOWN TO ELEVATION 288.30m A.S.L. OR 0.3m ABOVE WATER.
- BELOW WATER EXTRACTION TO ELEVATION 282m A.S.L. SHALL FOLLOW BEHIND ABOVE WATER EXTRACTION AS ABOVE WATER EXTRACTION PROCEEDS IN DIRECTION SHOWN.
- PRIOR TO USING CLAY MATERIALS FROM LANDS WEST OF AREAS I AND II, THE CLAY BACKFILL AREA SHALL BE STRIPPED AND THE TOPSOIL AND OVERBURDEN STOCKPILED SEPARATELY FOR FUTURE PROGRESSIVE REHABILITATION.
- AS BELOW WATER EXTRACTION APPROACHES THE EAST AND WEST LIMITS OF EXTRACTION, INITIATE PROGRESSIVE BACKFILLING OF POND USING MATERIAL FROM CLAY BACKFILL AREA.
- BACKFILL SHALL BE GRADED IN ACCORDANCE WITH ELEVATIONS SHOWN ON PAGE 3 OF 4. SURFACE DRAINAGE SHALL BE TOWARD THE POND.
- USE REMAINING TOPSOIL AND OVERBURDEN FROM STOCKPILE ON WEST SETBACK TO COMPLETE REHABILITATION OF AREA II.
- AFTER PLACING FILL AND SUBSOIL, PLACE A MINIMUM OF 150mm OF TOPSOIL. THE AREA SHALL THEN BE SEEDING IN ACCORDANCE WITH NOTES ON PAGE 3 OF 4.

AREA III

- STRIP AREA III AND STOCKPILE TOPSOIL AND OVERBURDEN SEPARATELY ON THE SOUTH SETBACK FOR FUTURE PROGRESSIVE REHABILITATION.
- INITIATE EXTRACTION IN DIRECTION SHOWN TO ELEVATION 288.30m A.S.L.
- BELOW WATER EXTRACTION TO ELEVATION 282m A.S.L. SHALL FOLLOW BEHIND ABOVE WATER EXTRACTION IN DIRECTION SHOWN.
- AS BELOW WATER EXTRACTION APPROACHES EAST, WEST, AND SOUTH LIMITS OF EXTRACTION, INITIATE PROGRESSIVE BACKFILLING OF POND USING MATERIAL FROM CLAY BACKFILL AREA.
- BACKFILL SHALL BE GRADED IN ACCORDANCE WITH ELEVATIONS SHOWN ON PAGE 3 OF 4. SURFACE DRAINAGE SHALL BE TOWARD THE POND.
- AT THE NARROW CHANNEL, BACKFILL TO CREATE ACCESS TO AREA IV.
- COMPLETE REHABILITATION OF AREA III USING STOCKPILED TOPSOIL AND OVERBURDEN AND CLAY MATERIAL FROM THE RIDGE ALONG THE SIDE OF THE AREA II TO BACKFILL TO A MINIMUM OF 1m ABOVE THE WATER TABLE IN AREA III.
- AFTER PLACING FILL AND SUBSOIL, PLACE A MINIMUM OF 150mm TOPSOIL. THE AREA SHALL THEN BE SEEDING IN ACCORDANCE WITH NOTE # 3 ON SHEET PAGE 3 OF 4.

OPERATIONAL PLAN
STANLEY PIT
NORTH HALF LOT, 13, CONCESSION 14
MUNICIPALITY OF MIDDLESEX CENTRE
(FORMERLY TOWNSHIP OF LONDON),
COUNTY OF MIDDLESEX

PROJECT NO. 93-16
SHEET NO. 2 OF 4
PLAN FILE NO.

SCALE 1:2000
20m 0 40m

ORIGINAL PLANS STAMPED BY D.W. PLETCH
FILE NAME: 2030/COMP/2030-OP-2.PSD PLOT DATE: JULY 15, 2024

Huron-Middlesex Engineering Ltd.

REHABILITATION NOTES

- STAGING:** Rehabilitation shall proceed in each area upon completion of extraction operations.
- GRADING/SLOPES:** The final grading elevations shall be in general conformance with the elevations shown on the plan. The final elevation shall be 1 metre above the normal water table.
All sideslopes shall be graded to a minimum of 3 horizontal to 1 vertical above water level. Below water slopes and shoreline zones may vary from 1:1 to 10:1 to enhance wildlife and aquatic diversity. See details below.
A minimum depth of 850 mm of subsoil shall be spread uniformly over each rehabilitated area.
A minimum depth of 150 mm of topsoil shall be spread uniformly over each rehabilitated area.
- SOIL STRUCTURE:** Where compaction of the pit floor has occurred, deep ripping (sub-soiling) will be required prior to reapplication of the subsoil and topsoil to allow drainage and aeration in accordance with accepted farming practices.
Upon completion of placing topsoil in each rehabilitated area, the topsoil shall be cultivated, fertilized and seeded with a mixture of GRASSES AND LEGUMES THAT MAY INCLUDE THE FOLLOWING AT A RATE OF 125 KG/HA: BUCKWHEAT, RED CLOVER, WHITE CLOVER, TALL FESCUE, AND ANNUAL RYE.

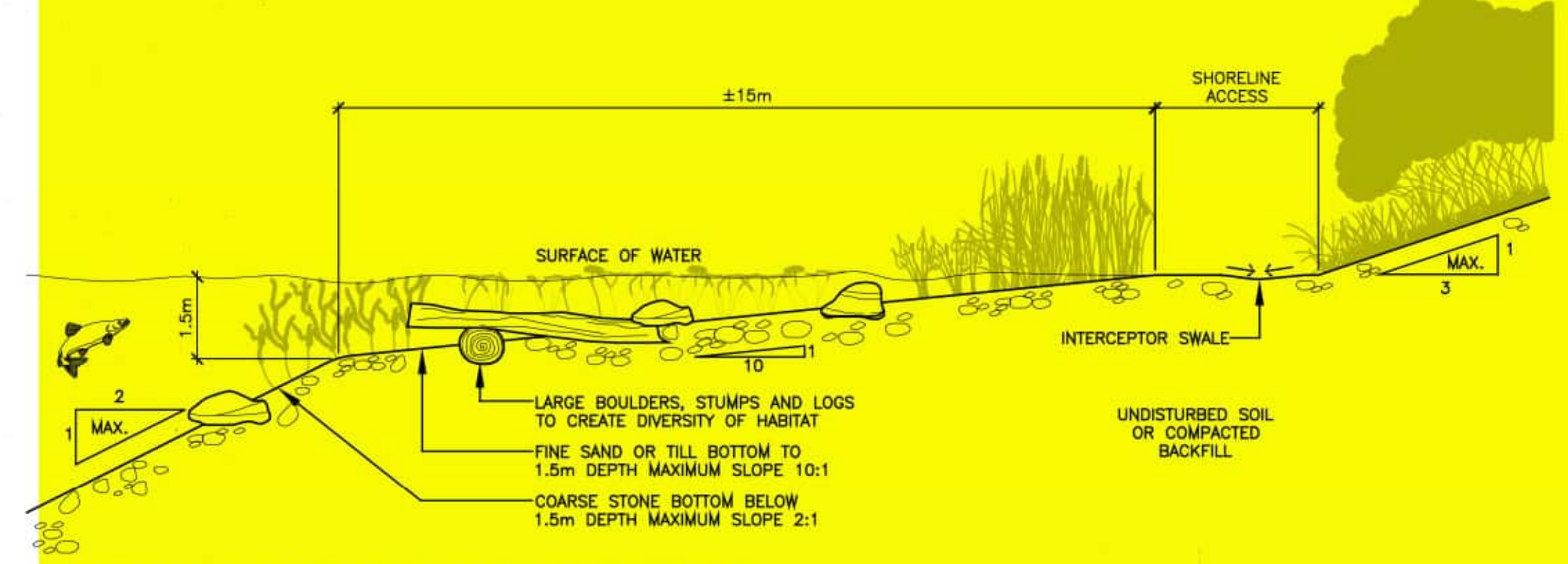
- MEADOW AND SIDE SLOPES SHALL BE SEEDING WITH AVAILABLE SEED SOURCES THAT HAVE BEEN USED IN THE LOCAL AREA EXCLUDING INVASIVE AND NON-NATIVE SPECIES.
- POND AND WETLAND REHABILITATION INFORMATION**
AREAS SHALL BE REHABILITATED TO WETLAND HABITAT AS FOLLOWS:
- UNDERWATER SLOPES WILL BE FORMED WITH ON-SITE FILL
- UNDERWATER SLOPES SHALL BE A MAXIMUM OF 2:1
- RESTORATION OF THE NEARSHORE, SHALLOW WETLAND ZONE AS SHOWN ON THE TYPICAL SHALLOW SHORELINE SECTION BELOW WILL GENERALLY BE ACCOMPLISHED AS FOLLOWS:**
- EXTRACTION AND ROUGH GRADING WILL CREATE A NEARSHORE SHORELINE AREA AT A SLOPE OF 10:1
- FINAL SLOPING OF THE SHORELINE TO CREATE PHYSICAL DIVERSITY BY SCALLOPING THE SHORELINE AND ADDING STRUCTURES
- WOODY DEBRIS- BRANCHES, TREE TRUNKS, STUMPS, ETC. CLEARED IN THE EXTRACTION PROCESS WILL BE SALVAGED WHERE POSSIBLE, FOR USE IN SHORELINE RESTORATION/ UNDERWATER HABITAT ENHANCEMENT.
- STUMPS, LOGS, BRUSH BUNDLES, ETC. SHALL BE INSTALLED ±30m O.C. ALONG THE SHORELINE IN THE SHALLOW ZONE TO CREATE PHYSICAL DIVERSITY.
- OVERSIZE ROCKS NOT UTILIZED IN THE AGGREGATE OPERATIONS WILL ALSO BE PLACED IN THE SHALLOW ZONE TO CREATE PHYSICAL DIVERSITY.
- THE INITIAL SHORELINE RESTORATION AREA WILL BE SPORADICALLY PLANTED WITH TREES AND SHRUBS. SPECIES MAY INCLUDE THE FOLLOWING NATIVE PLANTS:

- | | | | |
|-------------------|----------------|---------------------|-------|
| RED MAPLE | PUSSY WILLOW | SILVER MAPLE | LARCH |
| WHITE CEDAR | CHOKO CHERRY | SMOOTH SERVICEBERRY | |
| COMMON NINEBARK | GRAY DOGWOOD | COMMON ELDERBERRY | |
| RED OSIER DOGWOOD | STAGHORN SUMAC | SPECKLED ALDER | |

- INITIAL SHORELINE WETLAND AREAS SHALL BE PLANTED WITH CLUMPS OF EMERGENT AND SUBMERGENT NATIVE WETLAND PLANTS TO INITIATE COLONIZATION OF THE SITE AS NUTRIENT LEVELS INCREASE TO SUPPORT THEM. NATIVE WETLAND PLANTS SUCH AS:

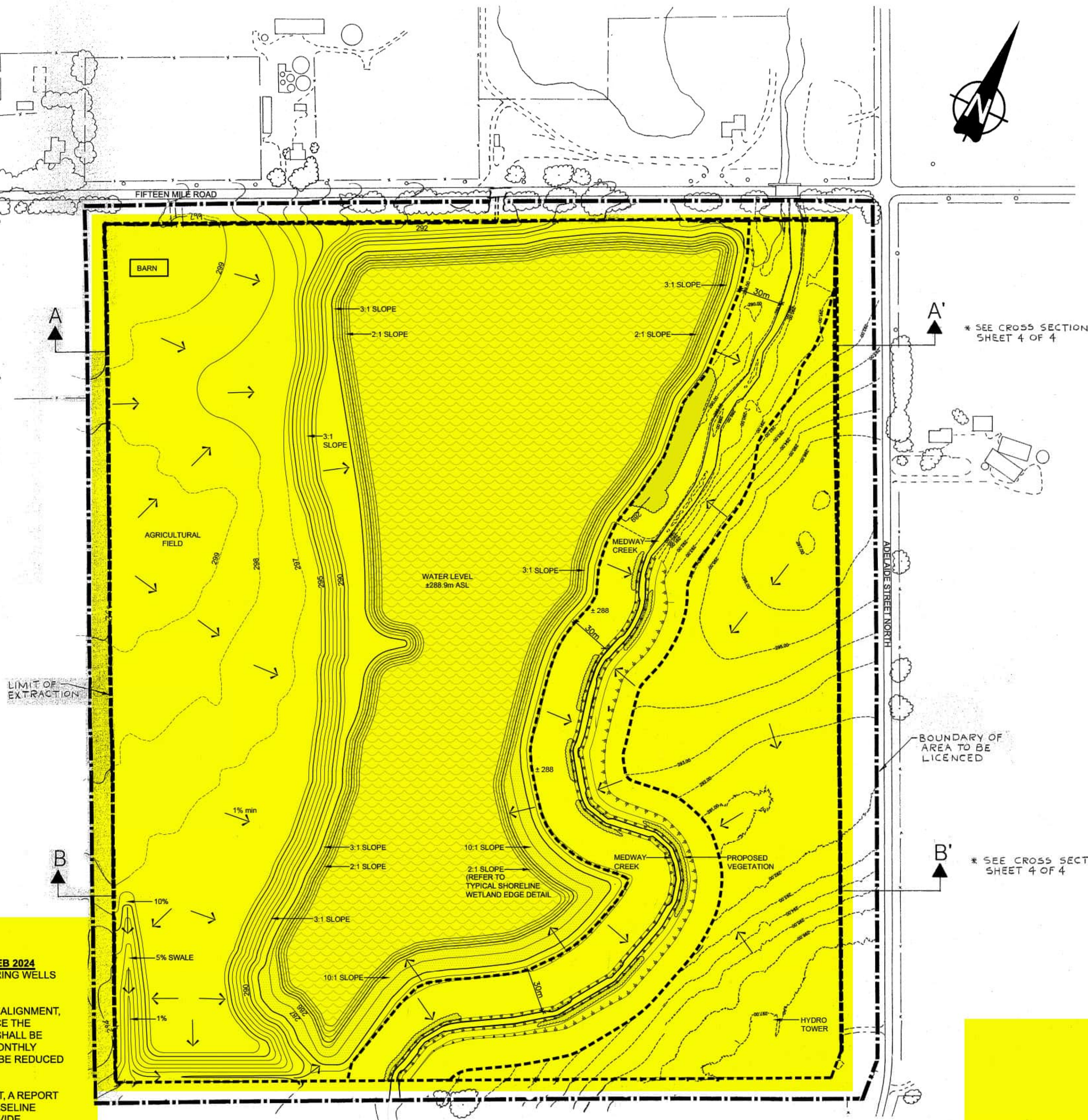
FLOATING PONDWEED	COONTAIL
BROAD LEAVED ARROWHEAD	PICKERELWEED
COMMON WOOLY BULRUSH	SOFTSTEM BULRUSH
GREEN-FRUITED BURREED	RIVER BULRUSH
BROAD LEAVED ARROWHEAD	DARK GREEN BULRUSH
SWAMP MILKWEED	WATER-LILY

- IMPORTATION OF FILL INFORMATION**
a. EXCESS SOIL, AS DEFINED IN ONTARIO REGULATION 244/97 MAY BE IMPORTED TO THIS SITE TO FACILITATE THE FOLLOWING REHABILITATION:
i. CREATION OF 3:1 SLOPES (OR SLOPING RATIO OTHERWISE DESCRIBED ON THE FINAL REHABILITATION PAGE)
ii. TOP DRESSING TO ESTABLISH VEGETATION
b. LIQUID SOIL, AS DEFINED BY ONTARIO REGULATION 406/19 UNDER THE ENVIRONMENTAL PROTECTION ACT, IS NOT AUTHORIZED FOR IMPORTATION INTO THE SITE.
c. THE QUALITY OF EXCESS SOIL IMPORTED TO THE SITE FOR FINAL PLACEMENT MUST BE EQUIVALENT TO OR MORE STRINGENT THAN THE APPLICABLE EXCESS SOIL QUALITY STANDARDS AS DETERMINED IN ACCORDANCE WITH ONTARIO REGULATION 244/97 AS AMENDED FROM TIME TO TIME AND MUST BE CONSISTENT WITH THE SITE CONDITIONS AND THE END USE IDENTIFIED IN THE APPROVED REHABILITATION PLAN.
d. WHERE A QUALIFIED PERSON IS RETAINED OR REQUIRED TO BE RETAINED IN ACCORDANCE WITH ONTARIO REGULATION 244/97, THE QUALITY, STORAGE, AND FINAL PLACEMENT OF EXCESS SOILS SHALL BE DONE ACCORDING TO THE ADVICE OF THE QUALIFIED PERSON.
e. EXCESS SOIL IMPORTED TO FACILITATE REHABILITATION AS DESCRIBED ON THIS SITE PLAN SHALL BE UNDERTAKEN IN ACCORDANCE WITH ONTARIO REGULATION 244/97 UNDER THE AGGREGATE RESOURCES ACT, AS AMENDED FROM TIME TO TIME.
f. THE CUMULATIVE TOTAL AMOUNT OF EXCESS SOIL THAT MAY BE IMPORTED TO THIS SITE FOR REHABILITATION PURPOSES IS 175,000 m³.



LEGEND

- LOT AND CONCESSION LINES
- SPOT ELEVATION
- CONTOUR LINES
- EXISTING DITCH
- DEPRESSION
- APPROXIMATE LIMIT OF DEPOSIT
- FENCE
- ENTRANCE & EXIT GATE
- MUNICIPAL ROADS
- OTHER ROADS (PRIVATE)
- EXISTING TREES/BUSH (D-DECIDUOUS) (C-CONIFEROUS)
- EXISTING BUILDING & STRUCTURES
- BOUNDARY OF AREA TO BE LICENCED
- LIMITS OF EXTRACTION
- WELL (DEPTH TO WATER TABLE)
- UTILITY POLE
- OPEN WATER
- WETLAND
- PROPOSED VEGETATION
- DIRECTION OF DRAINAGE



TECHNICAL RECOMMENDATIONS

- HYDROGEOLOGICAL REPORT- NOVATERRA ENVIRONMENTAL LTD., FEB 2024**
- WATER LEVELS SHALL BE MEASURED IN SEVEN ONSITE MONITORING WELLS (MW1 TO MW7, INCLUSIVE) ON A QUARTERLY BASIS.
 - UPON COMMENCEMENT OF EARTHWORKS FOR THE CHANNEL REALIGNMENT, MONITORING FREQUENCY SHALL CHANGE TO A MONTHLY BASIS. ONCE THE REALIGNED CHANNEL IS ESTABLISHED, TEMPORARY STAFF GAUGES SHALL BE INSTALLED IN THE NEW CHANNEL OPPOSITE MW5, MW6, AND MW7. MONTHLY MONITORING SHALL THEN CONTINUE FOR ONE FULL YEAR AND THEN BE REDUCED TO A QUARTERLY BASIS THEREAFTER.
 - AFTER ONE YEAR OF MONTHLY MONITORING POST-REALIGNMENT, A REPORT SHALL BE PREPARED BY A QUALIFIED PROFESSIONAL TO PRESENT BASELINE CONDITIONS OF THE REALIGNED CHANNEL. THE REPORT SHALL PROVIDE RECOMMENDATION FOR FUTURE MONITORING AND SHALL ACT AS A BASELINE FOR FUTURE COMPARISON.
 - ANNUAL MONITORING REPORTS SHALL BE PREPARED BY A QUALIFIED PROFESSIONAL TO ASSESS WHETHER PIT OPERATIONS HAVE ADVERSELY AFFECTED GROUNDWATER CONDITIONS AT THE SITE. THE REPORTS SHALL BE SUBMITTED TO THE MNRF IN AYLMER AND TO THE MECPL IN LONDON.
 - IF ANY WATER WELL IS ENCOUNTERED ONSITE DURING AGGREGATE EXTRACTION, SUCH WELL SHALL BE DECOMMISSIONED IN ACCORDANCE WITH O.REG. 903. MONITORING WELLS MW2, MW3, AND MW4 ARE PLANNED TO BE DECOMMISSIONED AS AGGREGATE EXTRACTION ENCLOSES UPON THEM.
 - THE REMAINING ONSITE MONITORING WELLS SHALL BE PRESERVED FOR THE LIFE OF THE LICENCE AND MAY BE DECOMMISSIONED IN ACCORDANCE WITH O.REG. 903 ONCE FINAL REHABILITATION IS COMPLETED AND APPROVED.

HM AMENDMENT BOX

No.	Revision	Date	Initial
1.	UPDATED PLAN TO REFLECT CREEK REALIGNMENT.	JULY 2024	SB

Revisions made by Harrington McAvan Ltd. dating from FEB 2024 only.



Harrington McAvan Ltd
411 Main Street, Unit 102
Lindsay, Ontario N4Y 2E3
Tel: 519-244-4252 Fax: 519-244-7623
www.harringtonmcavan.com

ORIGINAL PLANS BY:
Huron-Middlesex Engineering Ltd.
PREVIOUSLY STAMPED BY D. W. PLETCH

McCann Redi-Mix
69478 Bronson Line
R. R. #3
Dashwood, Ontario

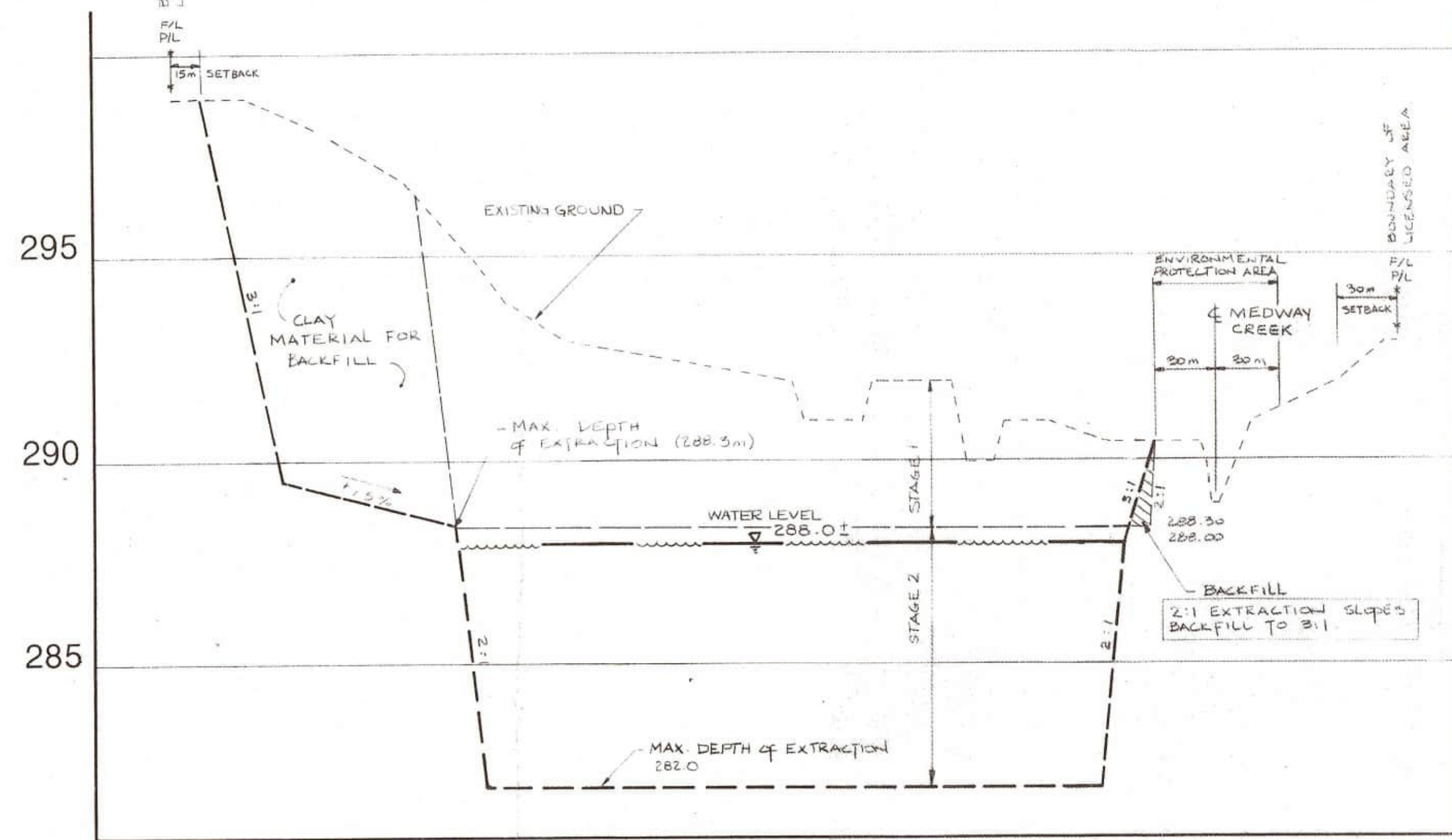
SCALE
1:2000
20m 0 40m

REHABILITATION PLAN
STANLEY PIT
NORTH HALF LOT 13, CONCESSION 14
TOWNSHIP OF LONDON
COUNTY OF MIDDLESEX

PROJECT NO.
87 - 10
SHEET NO.
3 OF 4
PLAN FILE NO.

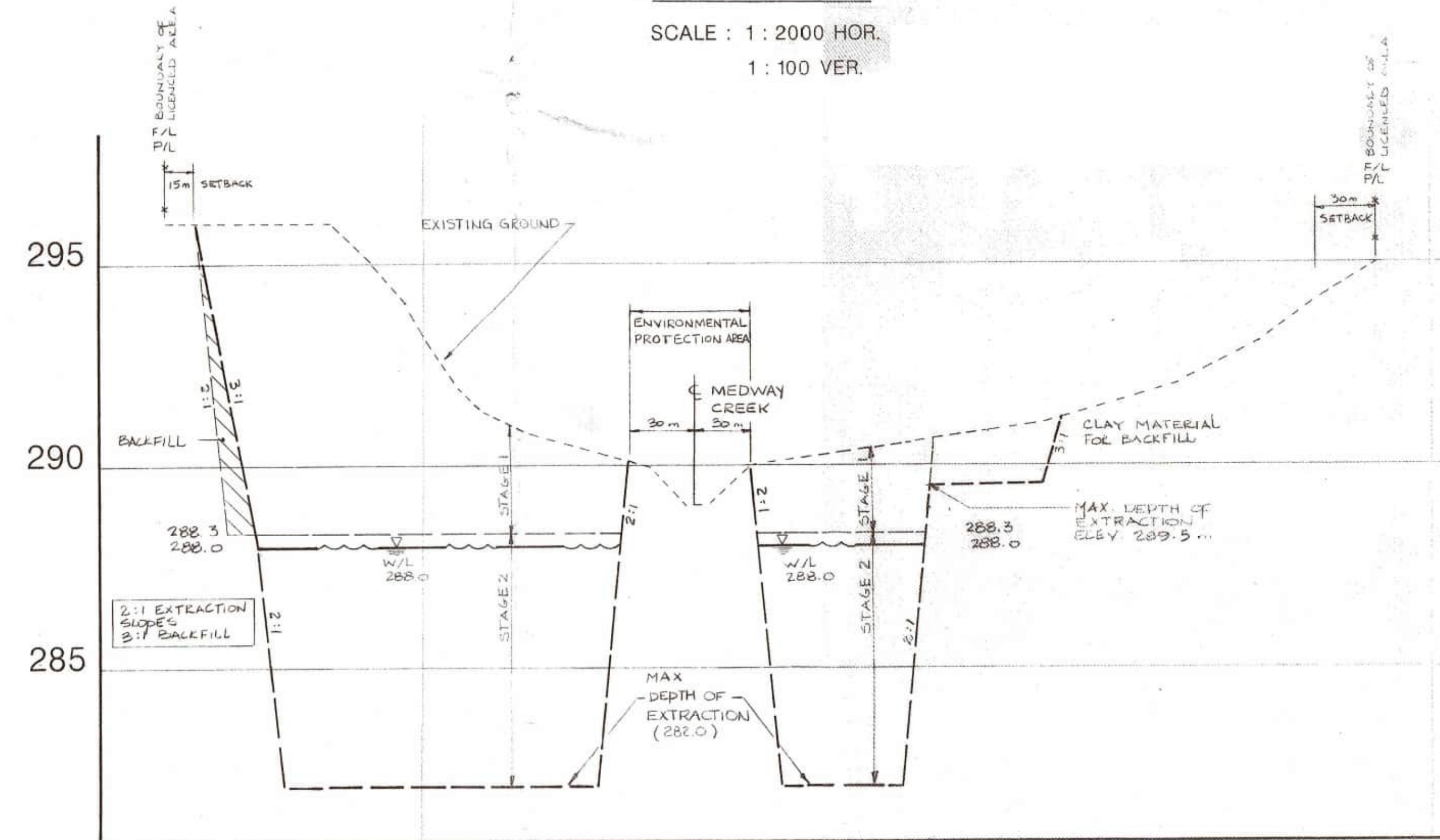
DESIGNED	NO.	REVISION	DATE	BY
DESIGNED: RJM	1	REVISED AS PER MNR REQUEST	15 APR 2024	RJM
DRAWN: RJM/CAH	2	NORTH SLOPE REDUCED TO 10:1	14/09/2024	WAS
CHECKED: RJM	3	DRY HYDRANT ADDED	14/09/2024	WAS
APPROVED: DWP				
DATE: 23 DEC. 1981				

OPERATIONAL



SECTION A-A'

SCALE : 1 : 2000 HOR.
1 : 100 VER.



SECTION B-B'

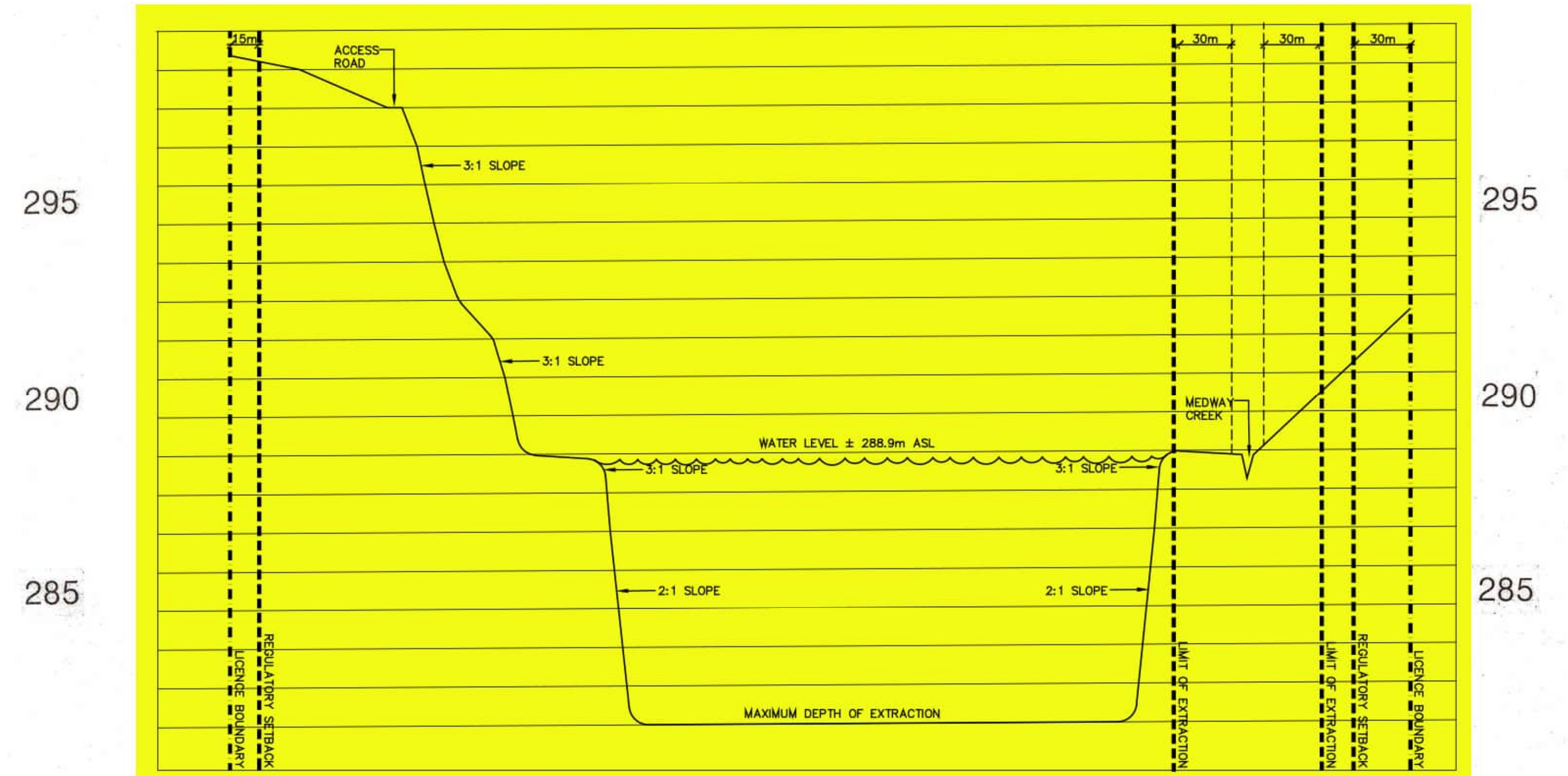
SCALE : 1 : 2000 HOR.
1 : 100 VER.



ORIGINAL PLANS STAMPED BY D.W. PLETCH

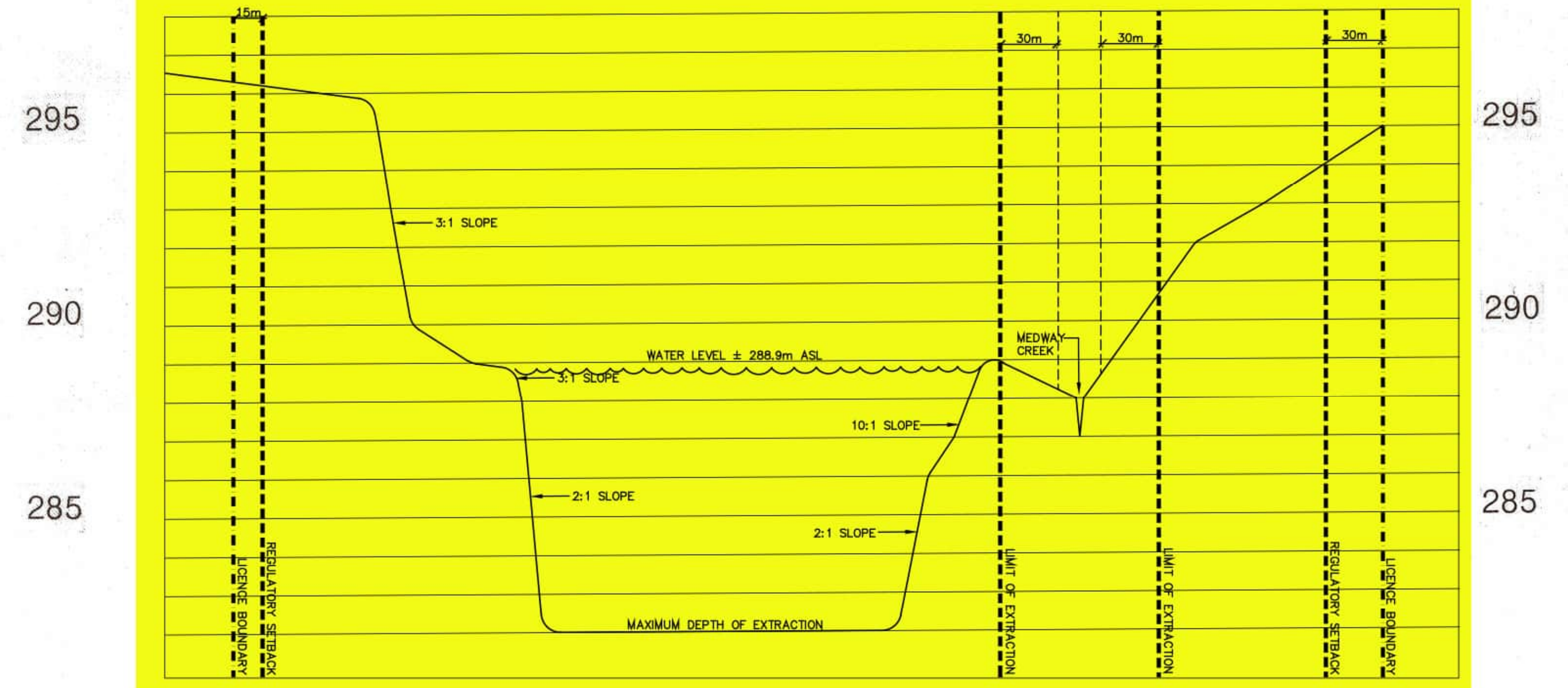
McCann Redi-Mix
69478 Bronson Line
R. R. #3
Dashwood, Ontario

REHABILITATION



SECTION A-A'

SCALE : 1 : 2000 HOR.
1 : 100 VER.



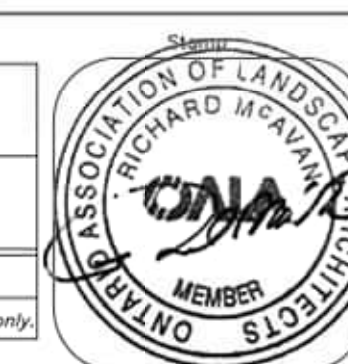
SECTION B-B'

SCALE : 1 : 2000 HOR.
1 : 100 VER.

HM AMENDMENT BOX

No.	Revision	Date	Initial
1	UPDATED TO REFLECT REALIGNMENT OF MEDWAY CREEK.	JULY 2024	SB

Revisions made by Harrington McAvan Ltd. dating from March 2024 only.



Harrington McAvan Ltd
41 Main Street, Unit 102
Lindsay, Ontario L3R 2E5
Tel: 519-244-8281 Fax: 519-244-7523
www.harringtonmcan.com

SCALE
AS SHOWN

CROSS SECTIONS
STANLEY PIT
NORTH HALF LOT, 13, CONCESSION 14
MUNICIPALITY OF MIDDLESEX CENTRE
(FORMERLY TOWNSHIP OF MIDDLESEX),
COUNTY OF MIDDLESEX

PROJECT NO.
93-16
SHEET NO.
4 OF 4
PLAN FILE NO.
OCT 25 1994

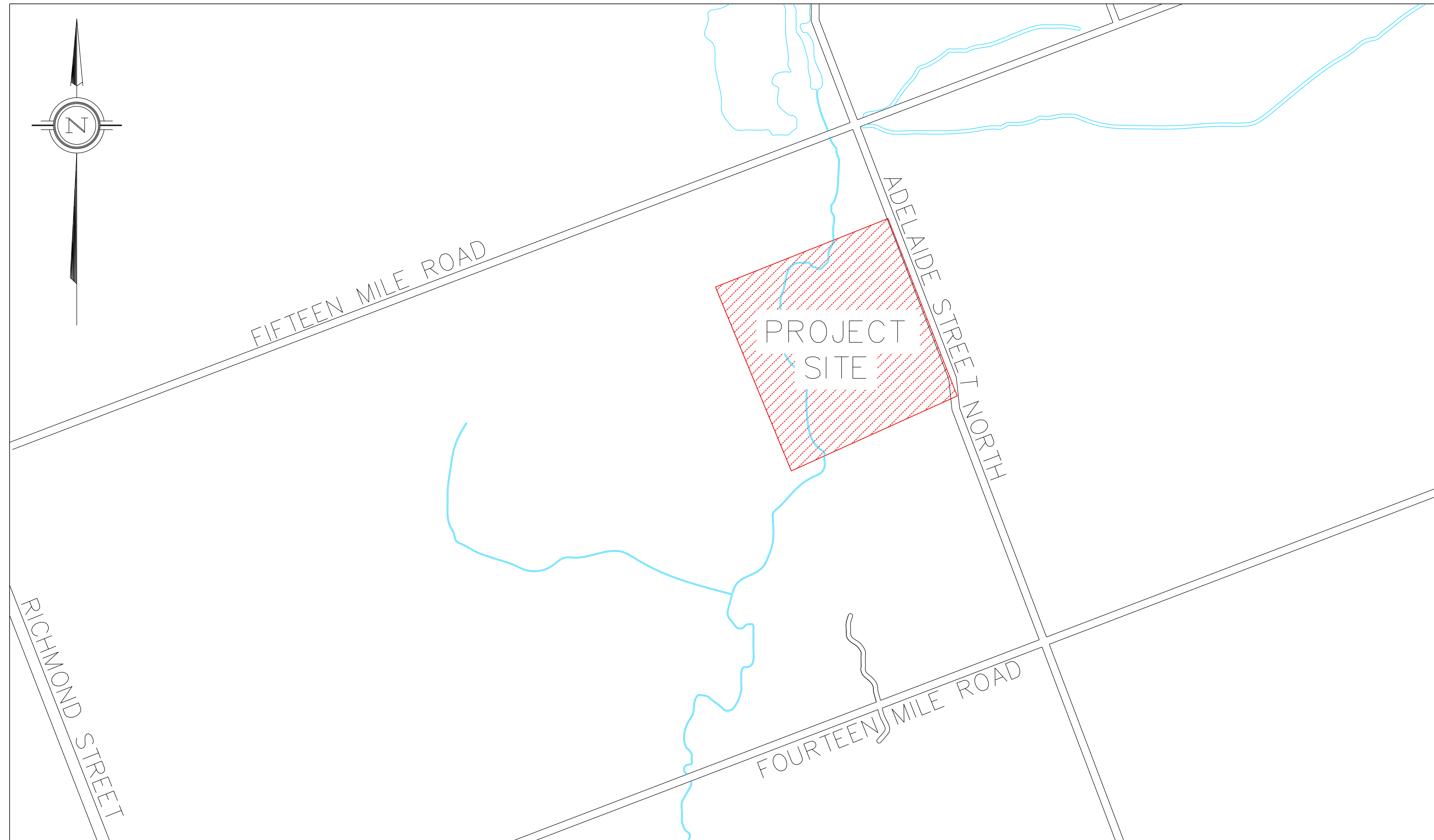
Appendix 9. Stanley Pit Natural Channel Design

STANLEY PIT NATURAL CHANNEL RELOCATION

PART LOT 13, CONCESSION 14, MUNICIPALITY OF MIDDLESEX CENTRE
(FORMERLY LONDON TOWNSHIP), MIDDLESEX COUNTY, ONTARIO

DATE PLOTTED: 2024-04-24
PLOT SCALE: 1:0.0254

Z:\Projects\2020\20-722 - Stanley Pit Flood Study & Channel Design\05_Drawings\CAD\20-722-Stanley Pit_Bess_2D.dgn

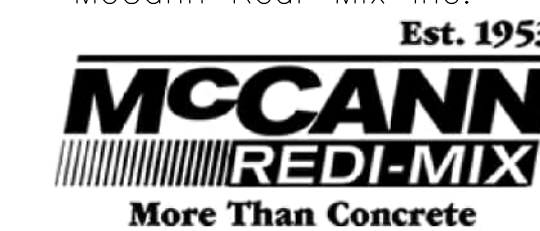


KEY MAP
(NOT TO SCALE)

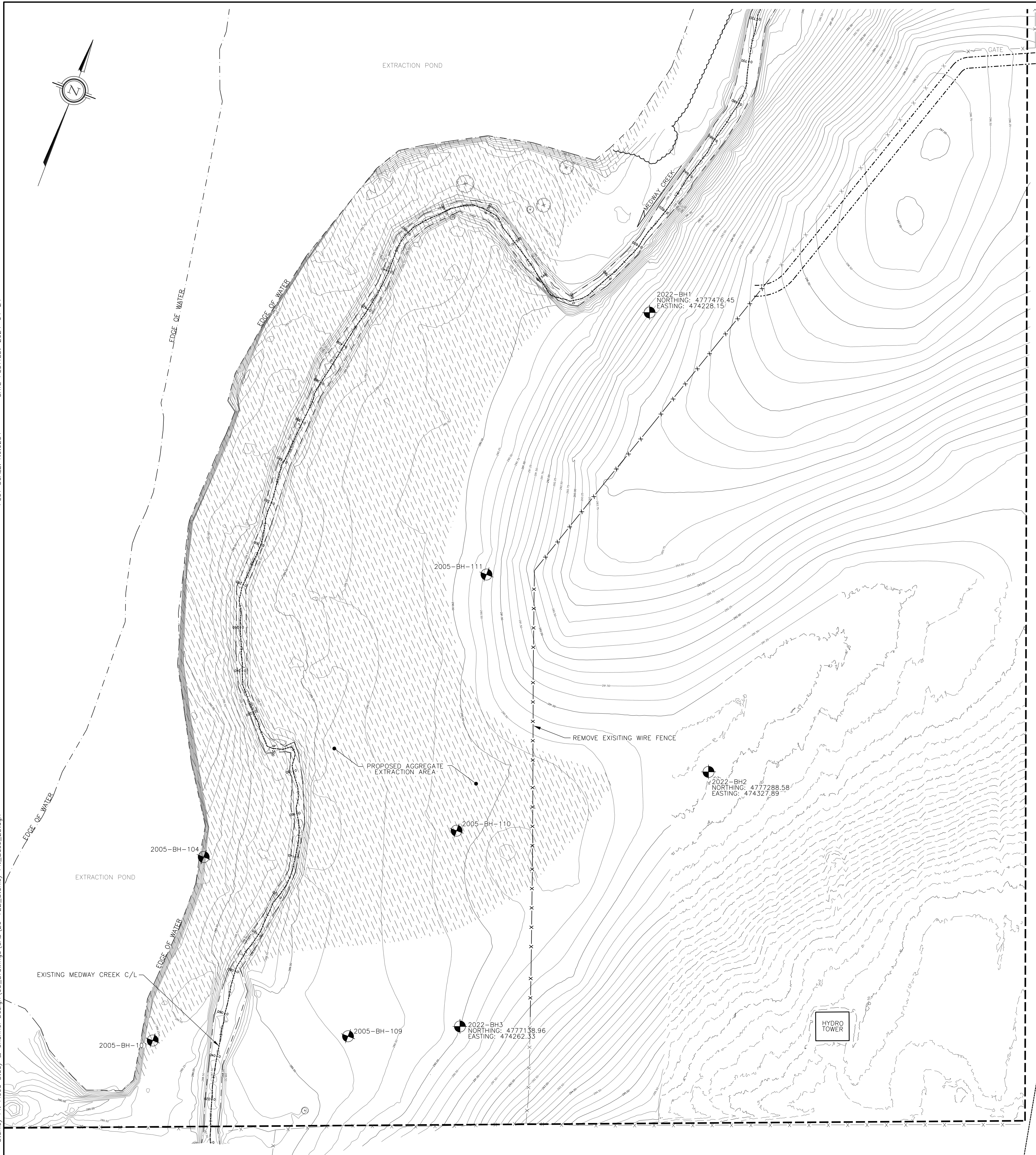
INDEX TO DRAWINGS

SHEET NUMBER	DRAWING NUMBER	DRAWING TITLE
1	GP	GENERAL PLAN, REMOVALS AND NOTES
2	ESC-1	EROSION AND SEDIMENT CONTROL NOTES AND DETAILS
3	ESC-2	EROSION AND SEDIMENT CONTROL STAGING PLAN
4	SP-1	SITE PLAN, PROFILE AND SECTIONS - STN. 0+000 TO 0+200
5	SP-2	SITE PLAN, PROFILE AND SECTIONS - STN. 0+200 TO 0+400
6	SP-3	SITE PLAN, PROFILE AND SECTIONS - STN. 0+400 TO 0+590
7	SGP	GENERAL SITE GRADING PLAN
8	CD	CONSTRUCTION DETAILS
9	RP	SITE RESTORATION PLAN

CLIENT NAME:
McCann Redi-Mix Inc.



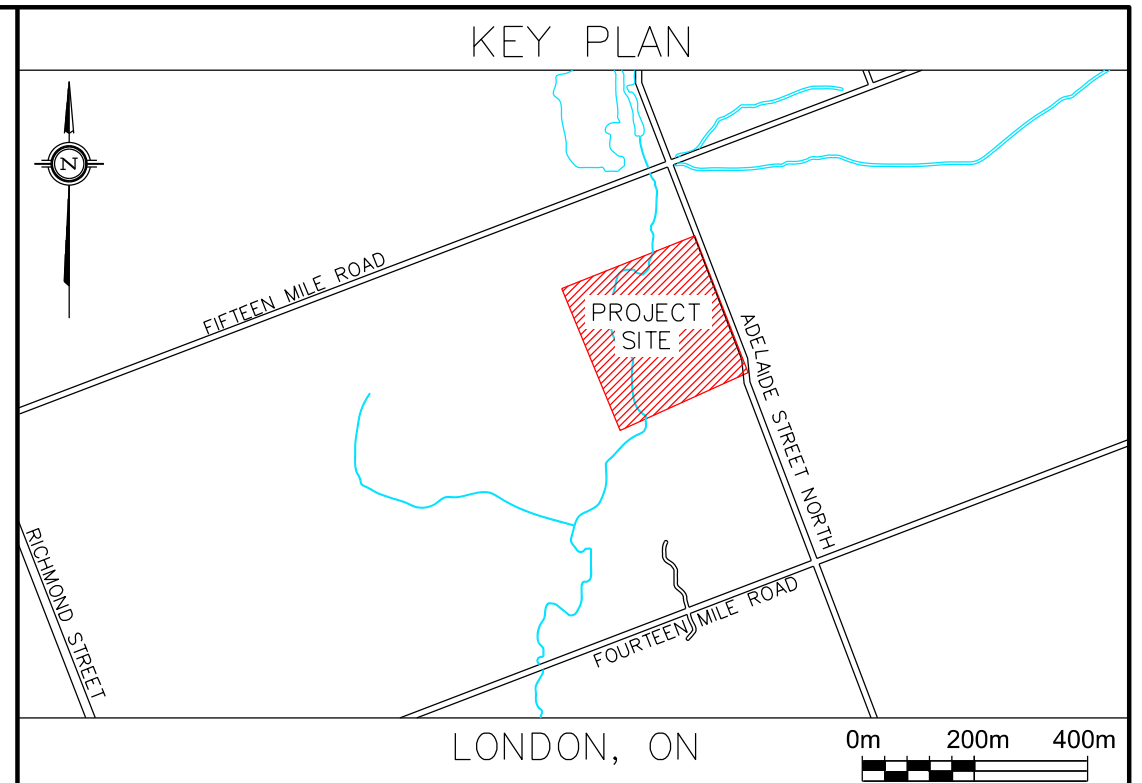
Z:\Projects\2020\20-722 - Stanley Pit Flood Study & Channel Design\05_Drawings\CAD\20-722-Stanley Pit_Base_20.dgn DATE PLOTTED: 2024-04-24 PLOT SCALE: 1:10254



ADELAIDE STREET NORTH

GENERAL NOTES

- THIS SET OF DRAWINGS IS TO BE READ IN CONJUNCTION WITH ACCOMPANYING SPECIFICATIONS.
- ALL DIMENSIONS ARE IN METRIC UNITS AND REFERENCED TO GEODETIC DATUM, UNLESS OTHERWISE SHOWN.
- ALL DIMENSIONS TO BE CHECKED AND VERIFIED ON SITE BY THE CONTRACTOR AND ANY DISCREPANCIES REPORTED TO THE SITE ENGINEER.
- SURVEY COMPLETED ON THE 4th & 5th DAYS OF NOVEMBER, 2020.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR LAYOUT AND SURVEY CONTROL DURING CONSTRUCTION. THIS INCLUDES THE EXACT ROUTE FOR SITE ACCESS.
- THE CONTRACTOR IS RESPONSIBLE FOR EXACTLY LOCATING ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. THE CONTRACTOR IS TO ENSURE ALL EXISTING INFRASTRUCTURE (IF APPLICABLE) IS PROTECTED FROM DAMAGES DURING CONSTRUCTION AND WILL BE HELD RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH ANY DAMAGES INCURRED DUE TO CONSTRUCTION.
- THE CONTRACTOR SHALL DELINEATE THE REQUIRED WORKING AREA ON-SITE PRIOR TO THE START OF WORK AND SHALL CONFINE OPERATIONS WITHIN THE DEFINED AREA.
- WORKING AREA(S), ACCESS REQUIREMENTS, AND TEMPORARY MATERIAL STORAGE AREA(S) ARE TO BE MAINTAINED IN GOOD REPAIR BY THE CONTRACTOR AT ALL TIMES. AREAS AFFECTED BY THE CONTRACTORS ACTIVITIES ARE TO BE REINSTATED TO EXISTING CONDITIONS OR BETTER.
- THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING EROSION AND SEDIMENT CONTROLS AS SHOWN IN DRAWING #ESC-2, IN GOOD REPAIR FOR THE DURATION OF CONSTRUCTION.
- EQUIPMENT REFUELING AND MAINTENANCE TO BE COMPLETED ONLY IN DESIGNATED AREA.
- ALL TREES TO BE REMOVED FOR PROPOSED WORKS AND SITE ACCESS ARE TO BE IDENTIFIED PRIOR TO CONSTRUCTION AND CONFIRMED WITH ENGINEER ON-SITE. TREE REMOVALS WILL ABIDE BY THE MIGRATORY BIRD WINDOW BETWEEN APRIL 1 AND AUGUST 31. SMALL TREES MAY BE SALVAGED AND REPLANTED ON SITE.
- DISTURBANCE TO THE EXISTING VEGETATED FLOOD PLAIN AREA AND OR WOOD LOT SHOULD BE MINIMIZED. THE LIMITS OF DISTURBANCE ARE TO BE IDENTIFIED AND CLEARLY MARKED PRIOR TO CONSTRUCTION.
- ALL GENERAL BACKFILL TO BE OF APPROVED MATERIAL AND COMPACTED TO A MINIMUM 95% PROCTOR DENSITY UNLESS OTHERWISE STATED.
- ANY DAMAGES TO THE SITE ACCESS ROUTE IS TO BE RESTORED TO EXISTING CONDITIONS OR BETTER UPON COMPLETION OF WORKS. ALL EXPOSED SOIL AREAS ARE TO BE COVERED WITH NATIVE SEED MIX, SEE DRAWING #RP, UNLESS OTHERWISE NOTED.
- THE CONTRACTOR IS RESPONSIBLE FOR REMOVAL AND LEGAL DISPOSAL OF ALL DEBRIS AND EXCESS MATERIAL(S) AS PER OPSS180.
- ALL INSTREAM WORKS ARE TO BE COMPLETED WITHIN A TIMING WINDOW OF JULY 15 TO MARCH 15, UNLESS OTHERWISE NOTED OR APPROVED WITH THE ASSOCIATED PERMIT(S). NO EQUIPMENT SHALL BE IN AN ACTIVE FLOWING WATERCOURSE.
- CONSTRUCTION TO PROCEED AS PER GENERAL CONSTRUCTION PLAN SHOWN ON DRAWING #ESC-1, UNLESS OTHERWISE APPROVED BY SITE ENGINEER.
- IN CASE OF A SPILL THE CONTRACTOR IS NOTIFY THE MECP SPILL/SPILLS ACTION CENTRE (SAC) PHONE NUMBER AT 416-325-3000 OR 1-800-268-6060, THE SITE ENGINEER AND OWNER.
- CONTRACTOR IS TO ENSURE ALL STONE WORKS ARE KEYED IN AND EMBEDDED INTO THE BANK.



NOTES

- ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
- CONTOUR INTERVAL IS 0.25m
- TOPOGRAPHIC SURVEY INFORMATION:
COORDINATE SYSTEM: UTM ZONE 17 N (GRID)
HORIZONTAL DATUM: NAD83 (CSRS - 2010)
VERTICAL DATUM: CGG2013
VERTICAL CONTROL: OBSERVED GPS ELEVATIONS
- ALL DIMENSIONS SHALL BE CHECKED AND VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO ANY CONSTRUCTION, AND ANY DISCREPANCIES SHALL BE REPORTED IMMEDIATELY TO THE PROJECT ENGINEER.
- ALL WORK SHALL BE IN ACCORDANCE WITH CURRENT CITY OF LONDON STANDARD SPECIFICATIONS AND DRAWINGS UNLESS OTHERWISE NOTED HEREIN.
- ORDER OF PRECEDENCE OF STANDARDS DRAWINGS IS FIRSTLY CITY OF LONDON AND SECONDLY ONTARIO PROVINCIAL STANDARDS (OPSD).
- THE CONTRACTOR TO BE RESPONSIBLE FOR LOCATION OF ALL EXISTING U/G AND OVERHEAD UTILITIES. CONTRACTOR IS REQUIRED TO OBTAIN ALL LOCATIONS & NOTIFY THE VARIOUS UTILITY COMPANIES 72 HOURS PRIOR TO THE COMMENCEMENT OF ANY WORK. THE MUNICIPALITY OF MIDDLESEX CENTRE AND CONSULTANT ASSUMES NO RESPONSIBILITY FOR THE LOCATIONS OF EXISTING UTILITIES AS INDICATED ON THE DRAWING.

BENCHMARK

ELEVATIONS ARE BASED ON GPS OBSERVATIONS FROM PERMANENT REFERENCE STATIONS IN THE NAD83 (CSRS-2010) COORDINATE SYSTEM, WITH HEIGHTS CONVERTED TO ORTHOMETRIC ELEVATIONS ON THE CGVD28 DATUM (1978 ADJUSTMENT) WITH GEOID MODEL CGG2013, AS SUPPLIED BY NATURAL RESOURCES CANADA.

CONTROL POINT 1:
ELEV: 292.56m
NORTHING: 4777805.8940
EASTING: 474206.5790
LOCATION: CROSS IN CONCRETE BY BRIDGE ON FIFTEEN MILE ROAD

COMPLETED BY:
GRECK AND ASSOCIATES LIMITED
SURVEY COMPLETED ON THE 4th & 5th DAYS OF NOVEMBER, 2020.

LEGEND

- APPROXIMATE PARCEL FABRIC
- - - WATERLINE AT TIME OF SURVEY
- CONTOUR MAJOR - 0.25m INTERVAL
- CONTOUR MINOR - 0.25m INTERVAL
- LIDAR CONTOUR MAJOR - 0.25m INTERVAL
- LIDAR CONTOUR MINOR - 0.25m INTERVAL
- x-x-x- EXISTING WIRE FENCE
- - - EXISTING VEGETATION LINE
- 2005-BH-XXX 2005 BOREHOLE
- 2022-BH-X 2022 BOREHOLE
- (*) EXISTING DECIDUOUS TREE
- - - SITE ACCESS ROUTE
- ▨ PROPOSED AGGREGATE EXTRACTION AREA

CLIENT NAME:
McCann Redi-Mix Inc. **MCCANN REDIMIX**
More Than Concrete

Greck
5770 Highway 7, Unit 3, Woodbridge, Ontario L4L 1T8

DATE	REVISION	BY
MAY 29, 2023	30% DESIGN ISSUED FOR REVIEW	B.G.
APRIL XX, 2024	ISSUED FOR APPROVALS	B.G.

SUBMISSION DRAWING
NOT FOR CONSTRUCTION

STANLEY PIT FLOOD STUDY & NATURAL CHANNEL DESIGN

GENERAL PLAN, REMOVALS, AND NOTES

DATE:	APRIL 2024	DESIGN BY:	B.G.	DWG. BY:	P.G.	APPD. BY:	B.G.
SCALE:	1:1000	DRAWING NO.:	GP	PROJECT NO.:	20-722	SHEET NO. 1	



CONSTRUCTION ACCESS VIA ADELAIDE STREET NORTH

EROSION AND SEDIMENT CONTROL PLAN NOTES

SECTION 1: SITE MANAGEMENT

1. EROSION AND SEDIMENT CONTROL (ESC) MEASURES WILL BE IMPLEMENTED PRIOR TO, AND MAINTAINED DURING THE CONSTRUCTION PHASES, TO PREVENT ENTRY OF SEDIMENT INTO THE WATER. ALL DAMAGED EROSION AND SEDIMENT CONTROL MEASURES SHOULD BE REPAIRED AND/OR REPLACED WITHIN 24 HOURS OF THE INSPECTION.
2. DISTURBED AREAS WILL BE MINIMIZED TO THE EXTENT POSSIBLE, AND TEMPORARILY OR PERMANENTLY STABILIZED OR RESTORED AS THE WORK PROGRESSES.
3. ALL IN-WATER AND NEAR WATER WORKS WILL BE CONDUCTED IN THE DRY WITH APPROPRIATE EROSION AND SEDIMENT CONTROLS.
4. THE EROSION AND SEDIMENT CONTROL STRATEGIES OUTLINED ON THE PLANS ARE NOT STATIC AND MAY NEED TO BE UPGRADED/AMENDED AS SITE CONDITIONS CHANGE TO MINIMIZE SEDIMENT LADEN RUNOFF FROM LEAVING THE WORK AREAS. IF THE PRESCRIBED MEASURES ON THE PLANS ARE NOT EFFECTIVE IN PREVENTING THE RELEASE OF A DELETERIOUS SUBSTANCE, INCLUDING SEDIMENT, THEN ALTERNATIVE MEASURES MUST BE IMPLEMENTED IMMEDIATELY TO MINIMIZE POTENTIAL ECOLOGICAL IMPACTS. THE REGULATING ENFORCEMENT OFFICER SHOULD BE IMMEDIATELY CONTACTED. ADDITIONAL ESC MEASURES TO BE KEPT ON SITE AND USED AS NECESSARY.
5. THE CONTRACTOR WILL ASSIGN A CAN-CISEC LEVEL III QUALIFIED PROFESSIONAL TO INSPECT ALL NEW CONTROLS, AS WELL AS ON A DAILY BASIS, OR FOLLOWING RAIN/SNOW MELT EVENT, TO MONITOR ALL WORKS, AND IN PARTICULAR WORKS RELATED TO EROSION AND SEDIMENT CONTROLS, DEWATERING OR UNWATERING, RESTORATION AND IN- OR NEAR- WATER WORKS. SHOULD CONCERNS ARISE ON SITE THE QUALIFIED PROFESSIONAL WILL CONTACT THE REGULATING ENFORCEMENT OFFICER AS WELL AS THE PROPONENT. THE CONTRACTOR IS TO PROVIDE DAILY EROSION AND SEDIMENT CONTROL INSPECTION RECORDS TO THE CONTRACT ADMINISTRATOR TO MEET REGULATORY MONITORING REQUIREMENTS.
6. ALL ACTIVITIES, INCLUDING MAINTENANCE PROCEDURES, WILL BE CONTROLLED TO PREVENT THE ENTRY OF PETROLEUM PRODUCTS, DEBRIS, RUBBLE, CONCRETE OR OTHER DELETERIOUS SUBSTANCES INTO THE WATER. VEHICULAR REFUELING AND MAINTENANCE WILL BE CONDUCTED A MINIMUM OF 30 METERS FROM THE WATER.
7. THE PROPONENT/CONTRACTOR SHALL MONITOR THE WEATHER SEVERAL DAYS IN ADVANCE OF THE ONSET OF CONSTRUCTION TO ENSURE THAT THE WORKS WILL BE CONDUCTED DURING LOW-WATER (I.E. NEAR BASEFLOW CONDITIONS). SHOULD A SIGNIFICANT STORM EVENT (>20MM OF RAIN IN 24 HRS) BE FORECAST, THE CONTRACTOR WILL REMOVE ALL UNFIXED ITEMS FROM THE CHANNEL AND REGIONAL STORM FLOOD PLAIN THAT WOULD HAVE THE POTENTIAL TO CAUSE A SPILL OR AN OBSTRUCTION TO FLOW, E.G., FUEL TANKS, PORTA-POTTIES, MACHINERY, EQUIPMENT, CONSTRUCTION MATERIALS, COFFERDAMS, ETC.
8. ALL DEWATERING/UNWATERING SHALL BE TREATED AND RELEASED TO THE ENVIRONMENT AT LEAST 30 METERS FROM A WATERCOURSE AND ALLOWED TO DRAIN THROUGH A WELL-VEGETATED AREA, IF FEASIBLE. NO DEWATERING EFFLUENT SHALL BE SENT DIRECTLY TO ANY WATERCOURSE OR FOREST, OR ALLOWED TO DRAIN ONTO DISTURBED SOILS WITHIN THE WORK AREA. THESE CONTROL MEASURES SHALL BE MONITORED FOR EFFECTIVENESS AND MAINTAINED OR REVISED TO MEET THE OBJECTIVE OF PREVENTING THE RELEASE OF SEDIMENT LADEN WATER.
9. ALL ACCESS TO THE WORK SITE SHALL BE FROM EITHER SIDE OF THE WATERCOURSE. NO EQUIPMENT OR VEHICLES ARE PERMITTED TO CROSS THROUGH AN ACTIVELY FLOWING WATERCOURSE UNLESS APPROVED BY CONTRACT ADMINISTRATOR.
10. THE CONTRACTOR SHALL INSTALL SEDIMENT CONTROL MEASURES, AS REQUIRED TO CONTROL THE DISCHARGE OF EXPOSED SOIL OR TEMPORARY PILE(S) OF EXCAVATED SOILS OR, SOILS AND GRANULAR MATERIAL TO BE USED DURING CONSTRUCTION. WHEN POSSIBLE BIODEGRADABLE ALTERNATIVES TO SILT FENCING SUCH AS BIOSOXX SHOULD BE CONSIDERED.
11. EROSION AND SEDIMENT CONTROL MEASURES ARE TO REMAIN IN PLACE AND IN WORKING ORDER UNTIL ALL ON-SITE CONSTRUCTION IS COMPLETED OR UNTIL ALL EXPOSED SOIL SURFACES HAVE BEEN STABILIZED. NEWLY CONSTRUCTED STREAM BANKS AND BEDS ARE TO BE STABILIZED IMMEDIATELY WITH EROSION CONTROL MEASURES (I.E., TARP OR ESC BLANKET) PRIOR TO ANY PRECIPITATION EVENTS.
12. AREAS WHICH REMAIN DISTURBED FOR MORE THAN 30 DAYS SHALL BE STABILIZED USING TERRASEED OR APPROVED EROSION CONTROL BLANKET OR SIMILAR. IF CONDITIONS AREN'T SUITABLE FOR SEED APPLICATION AN BIODEGRADABLE EROSION CONTROL MATTING WILL BE USED IN ITS PLACE.
13. ALL SLOPES SHALL BE STABILIZED USING MEASURES SUCH AS EROSION CONTROL BLANKET AS PER OPSS MUNI 804 AND 805 OR APPROVED EQUIVALENT. NO EROSION AND CONTROL MEASURE SHALL HAVE ANY PLASTIC, EVEN IF IT IS BIODEGRADABLE.
14. MUNICIPAL ROADS ARE TO BE KEPT CLEAR OF EXCESS SEDIMENT.
15. THE CONTRACTOR MUST HAVE SUITABLE PUMPING AND FLOW BYPASS CAPABILITIES ON SITE AT ALL TIMES TO FACILITATE CONSTRUCTION ACTIVITIES IN THE DRY.
16. WHERE PRACTICAL, WORKS SHOULD BE COMPLETED IN STAGES TO REDUCE THE DURATION OF DISTURBED AREAS.
17. CONTRACTOR CAN DISPOSE OF THE MATERIAL USED IN THE PEA GRAVEL METER BAGS INTO THE CHANNEL OR SURROUNDING AREA. ALL PEA GRAVEL BAG FABRICS ARE TO BE REMOVED OFF OF SITE.
18. REFER TO EROSION AND SEDIMENT CONTROL GUIDE FOR URBAN CONSTRUCTION, 2019 FOR FURTHER EROSION AND SEDIMENT CONTROL MEASURES FOR FURTHER EROSION AND SEDIMENT CONTROL INFORMATION.

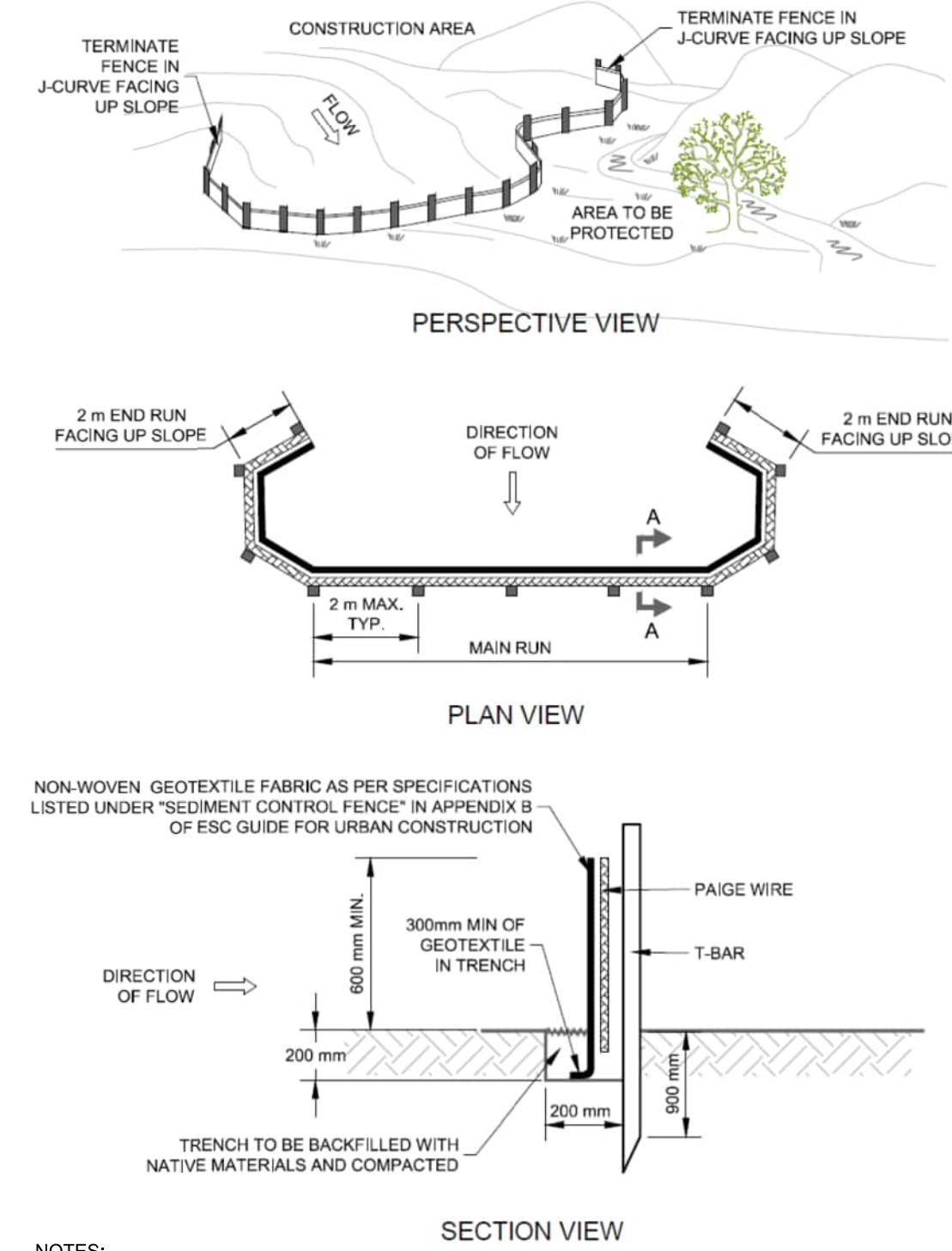
SECTION 2: CONSTRUCTION TIMING

ITEM	OPEN	END
TO PROTECT LOCAL FISH POPULATIONS DURING THEIR SPAWNING, NURSERY AND MIGRATORY PERIODS, IN-WATER/NEAR-WATER ACTIVITIES MAY ONLY OCCUR DURING THE TIME PERIOD OF:	JULY 15	MARCH 15

SECTION 3: FISH AND WILDLIFE RELOCATION

19. FISH AND WILDLIFE STRANDED WITHIN THE WORK AREA SHALL BE CAPTURED AND RELEASED LIVE IN SUITABLE HABITAT UPSTREAM OF THE WORK AREA UNDER THE SUPERVISION OF A QUALIFIED AQUATIC BIOLOGIST. A PERMIT FROM THE MINISTRY OF NATURAL RESOURCES AND FORESTRY IS REQUIRED.

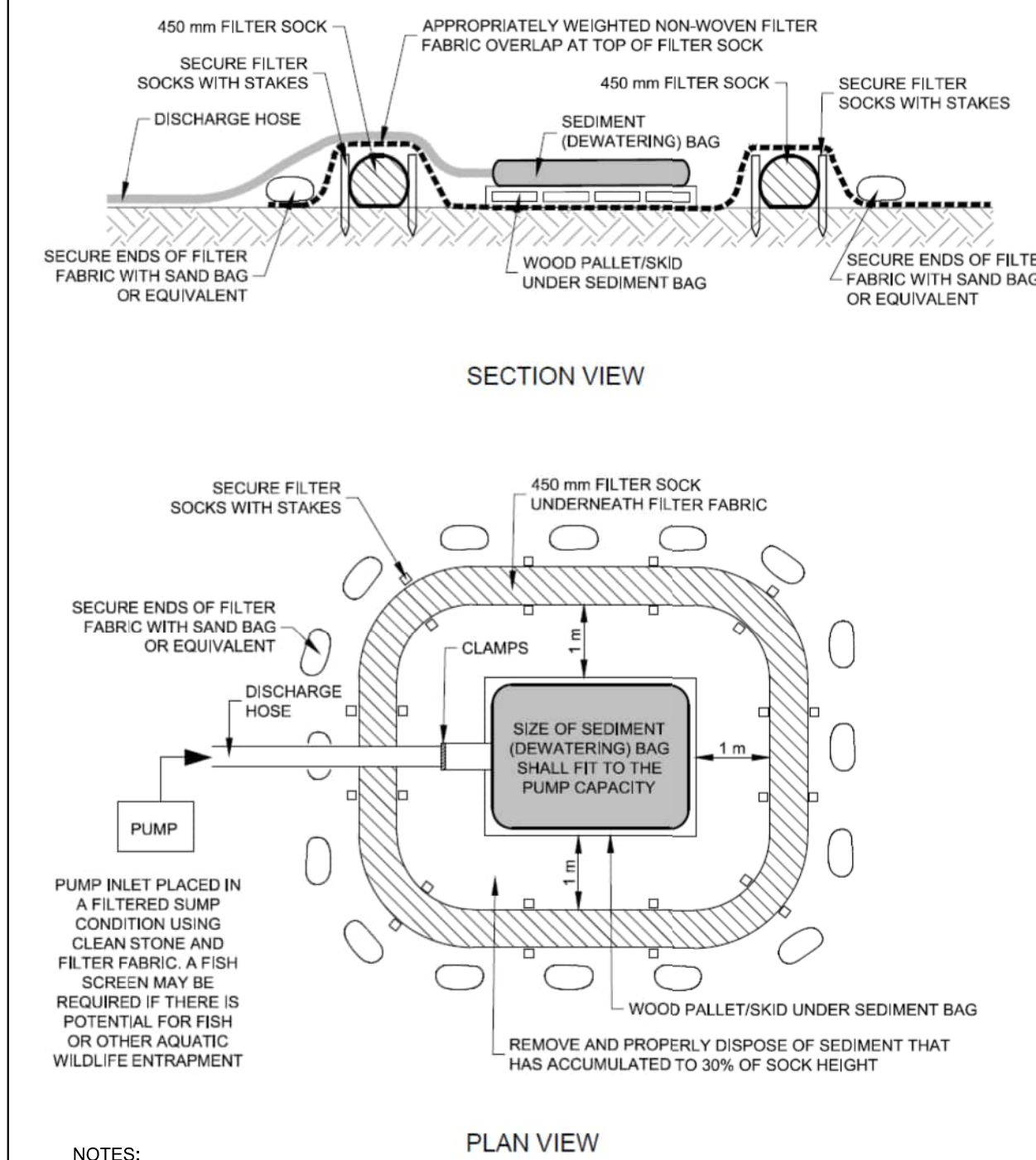
DETAIL 1 – SEDIMENT CONTROL FENCE (SINGLE ROW) N.T.S.



NOTES:

1. THIS DETAIL REPRESENTS AN IDEAL SCENARIO. SITE CONDITIONS VARY AND EROSION AND SEDIMENT MEASURES SHOULD BE TAILORED FOR EACH SITE AND PROJECT.
2. SILT CONTROL FENCE SHOULD BE ALIGNED WITH CONTOURS FOR SHEET OVERLAND FLOW.
3. SILT/SEDIMENT CONTROL FENCE IS TO BE LOCATED IN AREAS OF LOW SEDIMENT YIELD.
4. SILT/SEDIMENT CONTROL FENCE SHALL BE INSTALLED WITH FILTER CLOTH TOED INTO THE SOIL A MIN. OF 200mm BY EITHER STATIC SLICING OR TRENCH METHODS WITH COMPACTION OF TRENCH MATERIAL MEETING 95% STANDARD PROCTOR DENSITY.
5. STEEL T BAR POSTS ARE TO BE SPACED MAX. 2m ON CENTER.
6. FILTER CLOTH TO BE CONNECTED TO THE FENCE AT 1m INTERVALS.
7. FROZEN GROUND CONDITIONS REQUIRE FILTER CLOTH TO BE BACKFILLED IN TRENCH WITH CLEAR STONE.
8. GEOTEXTILE FILTER CLOTH TO BE COMPRISED OF NON-WOVEN U.V. STABILIZED MATERIAL.
9. SILT FENCE AND STRAW BALE TO BE IN DIRECT CONTACT TO MAXIMIZE FENCE STABILITY

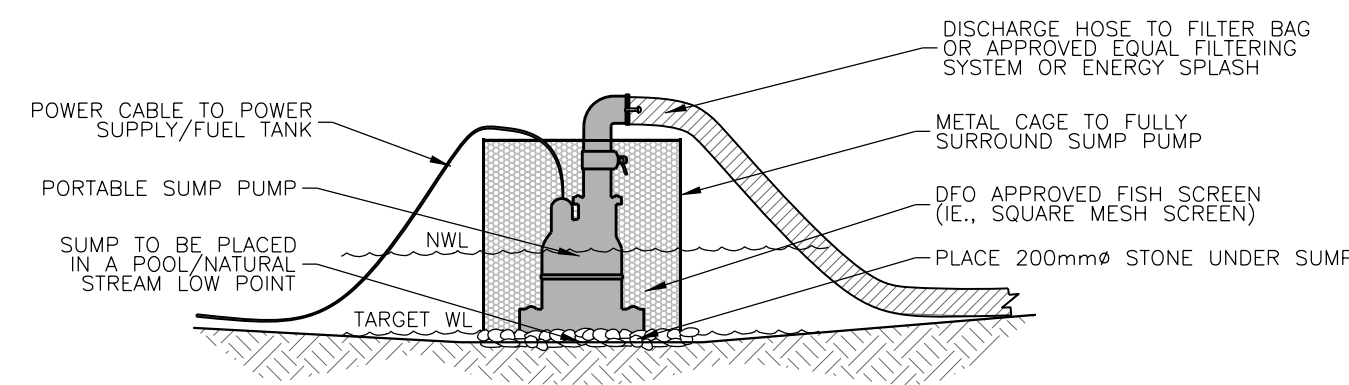
DETAIL 2 – DEWATERING TREATMENT TRAIN N.T.S.



NOTES:

1. PLACE FILTER BAG (3.5m X 5.0m TERRAFIX ENVIROBAG OR APPROVED EQUAL) ON A LEVEL STABILIZED AREA ABOVE THE VALLEY SLOPE. FILTREXX COTTON BIOSOXX (8'Ø GREEN WITH BLACK STRIPE) TO BE PLACE AROUND THE FILTER BAG.
2. TRENCH TO BE PUMPED AND DEWATERED INTO FILTER BAG
3. REPLACE UNIT WHEN HALF FULL OF SEDIMENT OR WHEN SEDIMENT HAS SIGNIFICANTLY REDUCED THE FLOW RATE OF PUMP DISCHARGE
4. ALLOW SEDIMENT BAG TO DRY IN DESIGNATED SEDIMENT DRYING AREA AND THEN DISPOSE OF THE UNIT AND SEDIMENT OFF SITE

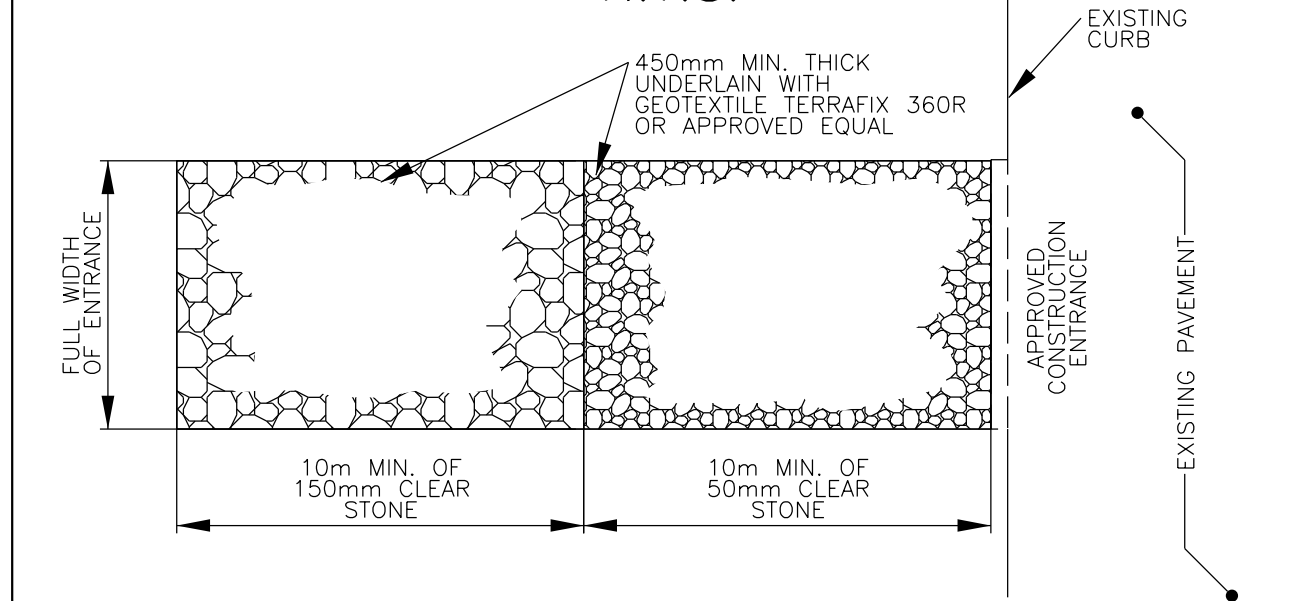
DETAIL 3 – INSTREAM DEWATERING PUMP N.T.S.



NOTES:

- REFER TO DFO INTERIM CODE OF PRACTICE: END-OF-PIPE FISH PROTECTION SCREENS FOR SMALL WATER INTAKES IN FRESHWATER. (<http://www.dfo-mpo.gc.ca/pnw-ppc/codes/screen-ecran-eng.html>)
- ONLY APPLICABLE FOR SMALL-SCALE WATER INTAKES, WHERE THE WATER INTAKE FLOW RATE IS UP TO 0.150m³/s, OR 150(L/s).
- SCREENS MUST BE DESIGNED TO MEET THE GUIDELINES ISSUED BY FISHERIES AND OCEANS CANADA.
- ENSURE THE DESIGN OPENING OF THE SCREEN MATERIAL DOES NOT EXCEED 2.54mm.
- ENSURE THERE ARE NO PROTRUSIONS ON THE SCREEN SURFACE OF SUPPORT STRUCTURES THAT COULD INJURE FISH.
- PROPERLY MAINTAIN CLEANING APPARATUSSES, SEALS AND SCREENS.
- TURN OFF INTAKE PUMP PRIOR TO THE REMOVAL OF THE SCREEN FOR CLEANING AND/ OR MAINTENANCE.

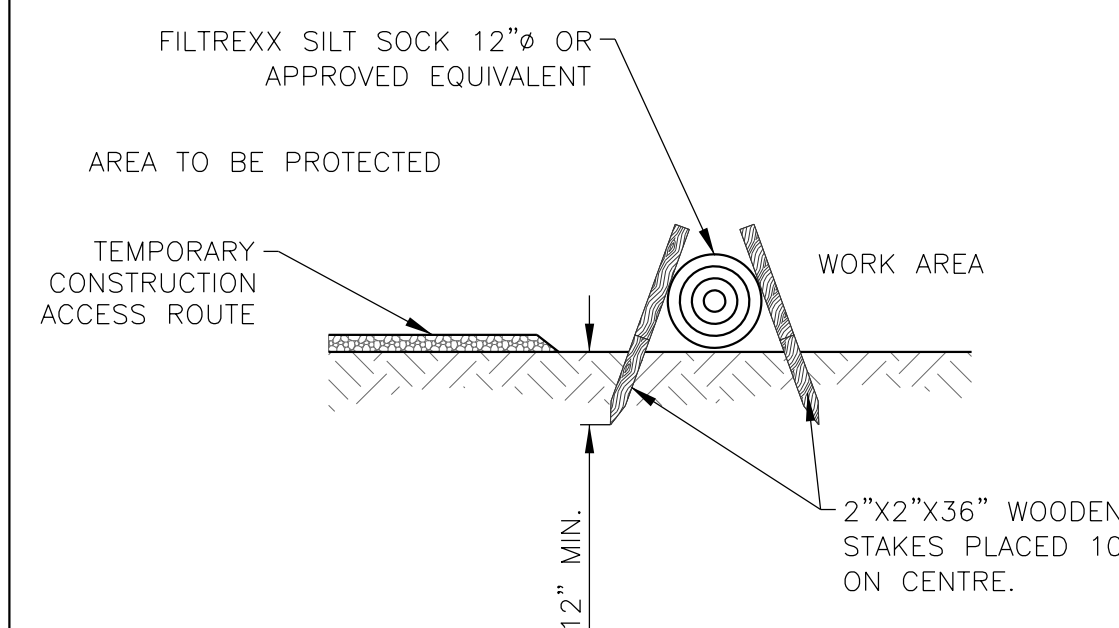
DETAIL 4 – MUD MAT CONSTRUCTION ENTRANCE N.T.S.



NOTES:

1. GRANULAR MATERIAL IS TO BE CLEAN APPROVED MATERIAL AND PLACED AT NOTED DIMENSIONS PRIOR TO LAND DISTURBANCE.
2. GEOTEXTILE IS TO BE UNDERLAIN OVER THE ENTIRE AREA PRIOR TO STONE PLACEMENT.
3. MAINTENANCE – THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL REDUCE TRACKING OR FLOWING OF SEDIMENT ONTO R.O.W. AND GRANULAR MATERIAL IS TO BE REPLACED AS WARRANTED OR DIRECTED BY THE SITE ENGINEER.

DETAIL 5 – SILT SOCK INSTALLATION N.T.S.



NOTES:

1. ALL MATERIAL TO MEET MANUFACTURES SPECIFICATIONS.
2. SILT SOCK FILL TO MEET APPLICATION REQUIREMENTS.
3. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY SITE SUPERVISOR.

CLIENT NAME: **McCann Redi-Mix Inc.** Est. 1953
McCANN REDI-MIX
 More Than Concrete

Greck
 5770 Highway 7, Unit 3, Woodbridge, Ontario L4L 1T8

DATE	REVISION	BY
MAY 29, 2023	30% DESIGN ISSUED FOR REVIEW	B.G.
APRIL XX, 2024	ISSUED FOR APPROVALS	B.G.

SUBMISSION DRAWING NOT FOR CONSTRUCTION

STANLEY PIT FLOOD STUDY & NATURAL CHANNEL DESIGN

EROSION AND SEDIMENT CONTROL NOTES AND DETAILS

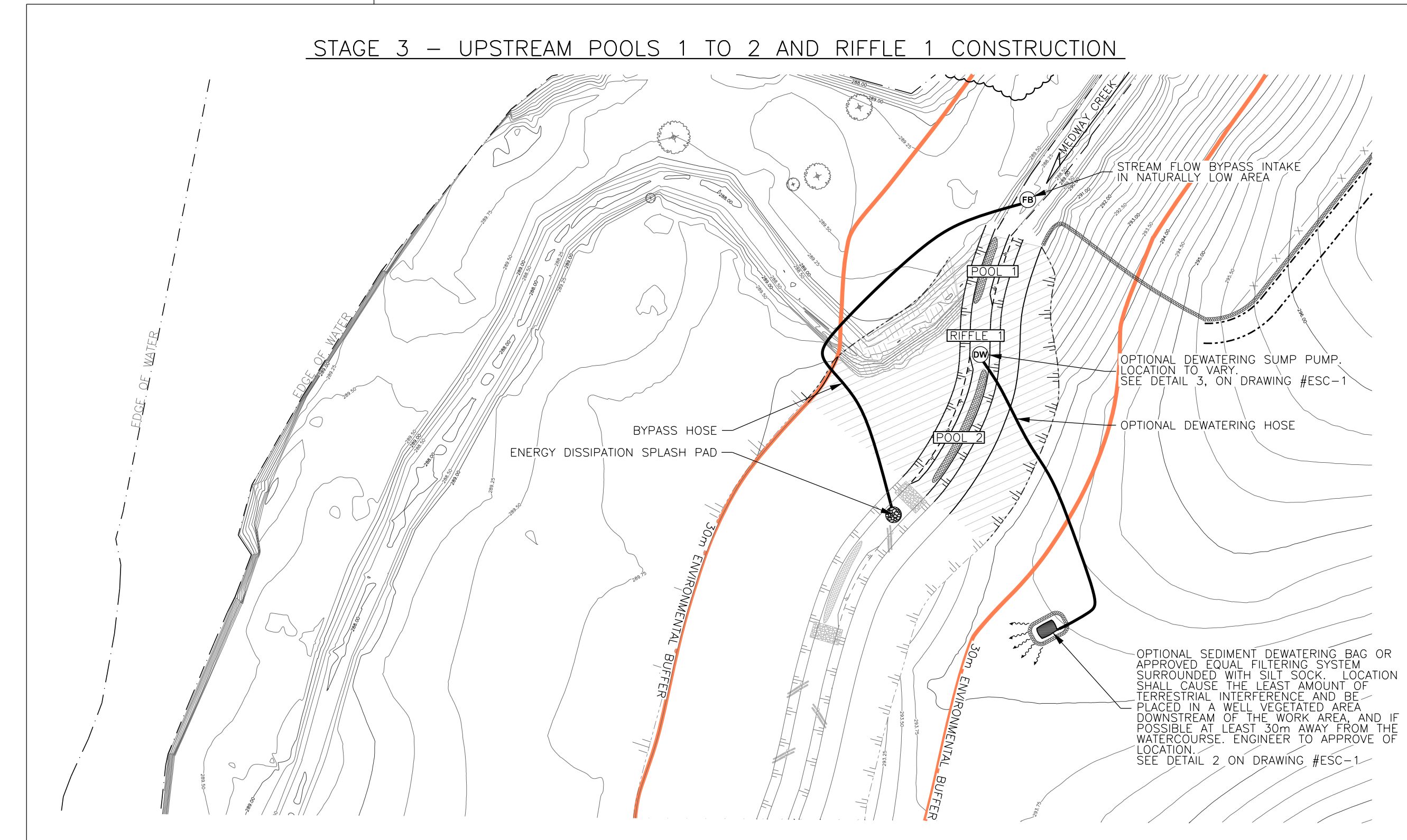
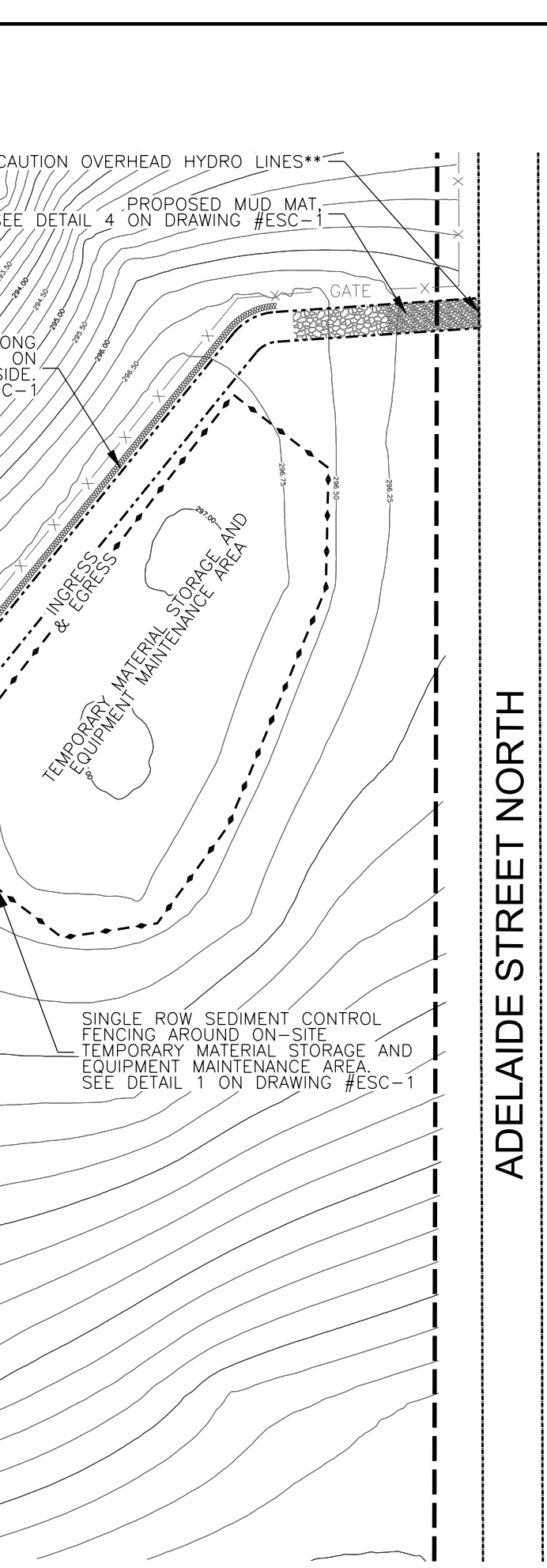
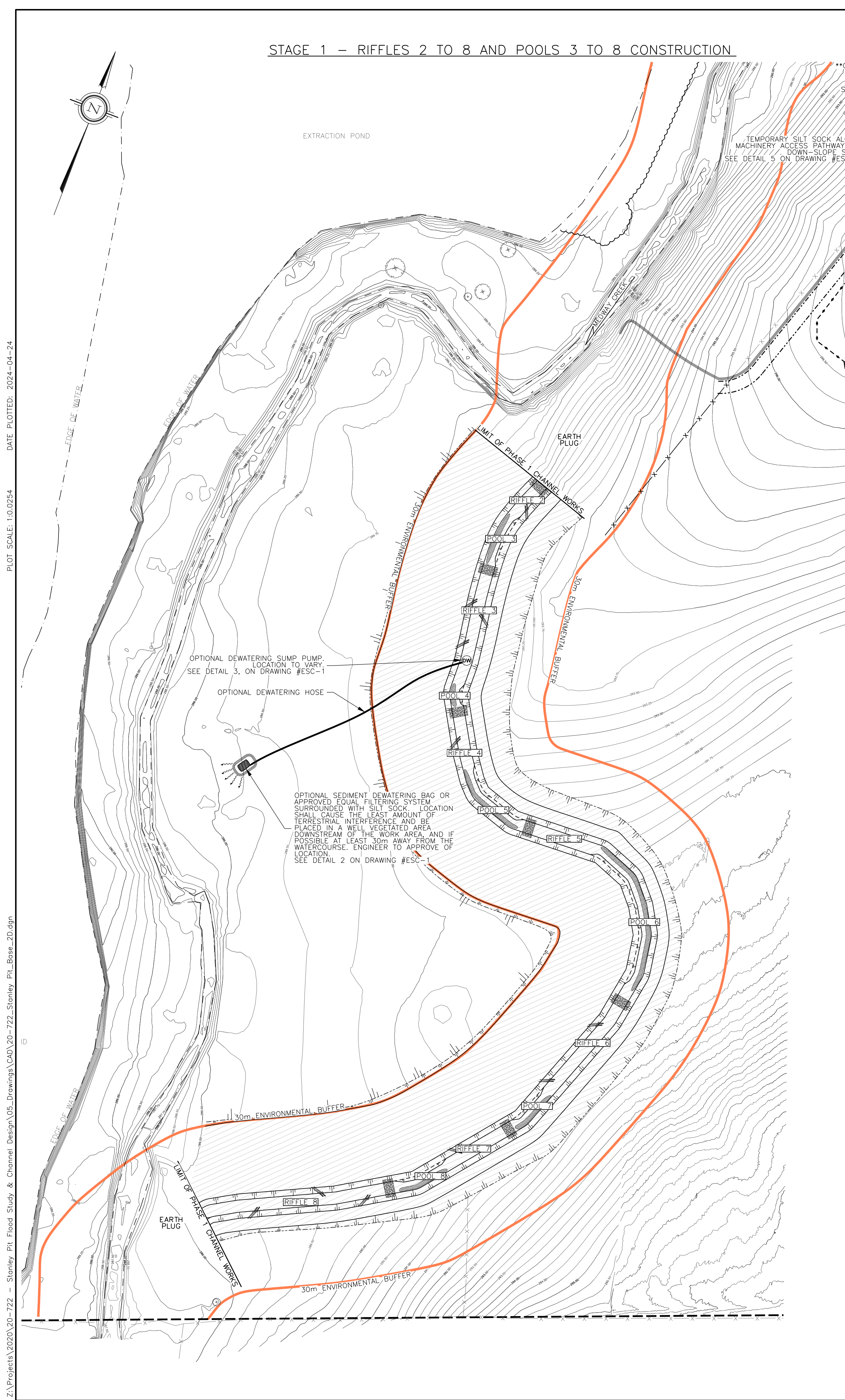
DATE:	DESIGN BY:	DWG. BY:	APPD. BY:
APRIL 2024	B.G.	P.G.	B.G.

SCALE:	DRAWING NO.:	PROJECT NO.:
	ESC-1	20-722

SHEET NO. 2

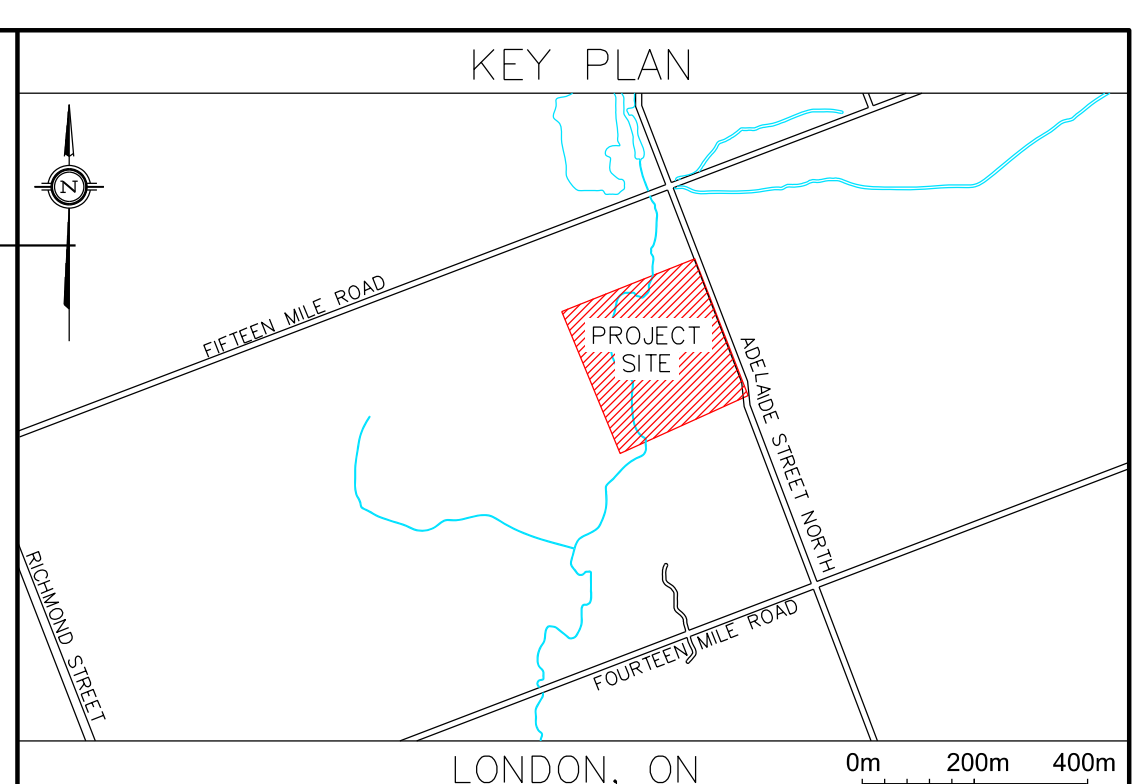
DATE PLOTTED: 2024-04-24
 PLOT SCALE: 1:0.0254

Z:\Projects\2020\20-722-722 - Stanley Pit Flood Study & Channel Design\05_Drawings\CAD\20-722-722-Stanley Pit_Base_2D.dgn



- GENERAL CONSTRUCTION STAGING PLAN FOR EROSION CONTROL**
- INSTALL SILT SOCK ALONG THE ACCESS ROAD WHEN IT IS WITHIN 15m OF THE WATERCOURSE.
 - INSTALL SEDIMENT CONTROL FENCING AROUND THE MATERIAL STORAGE AND EQUIPMENT AREAS.
 - DELINEATE WORK AREA.
- STAGE 1 – RIFFLES 2 TO 8 AND POOLS 3 TO 8 CONSTRUCTION**
- PERFORM REQUIRED EARTH WORKS WITHOUT DISTURBING EXISTING MEDWAY CREEK FLOWS.
- STAGE 2 – DOWNSTREAM POOLS 9 TO 10 AND RIFFLE 10 CONSTRUCTION**
- INSTALL APPROVED BYPASS AND OPTIONAL DEWATERING PUMPS, POWER GENERATOR AND DOWNSTREAM FILTER BAG TO SUIT STAGES OF WORKS TO COLLECT AND DISCHARGE EXCAVATION DEWATERING. THE LOCATION OF THE FILTER BAG SHOULD MINIMIZE DISTURBANCE, RILING AND EROSION TO THE SURROUNDING VEGETATION AND WHERE POSSIBLE BE LOCATED WITHIN AREAS VOID OF TREES AND SHRUBS.
 - PERFORM ALL REQUIRED EARTH WORKS.
 - PLACE FILL INTO EXISTING MEDWAY CREEK TO 30m BUFFER LIMIT TO ACT AS EARTH PLUG.
- STAGE 3 – UPSTREAM POOLS 1 TO 2 AND RIFFLE 1 CONSTRUCTION**
- REPOSITION BYPASS, OPTIONAL DEWATERING PUMPS, POWER GENERATOR AND DOWNSTREAM FILTER BAG TO SUIT CURRENT STAGE OF WORKS.
 - PERFORM ALL REQUIRED EARTH WORKS.
 - PLACE FILL INTO EXISTING MEDWAY CREEK TO 30m BUFFER LIMIT TO ACT AS EARTH PLUG.
 - REMOVE ALL PUMPING MEASURES ONCE WORKS ARE COMPLETED.
- COMPLETION AND REINSTATEMENT:**
- ALL DISTURBED AREAS TO BE SEED AND PROTECTED WITH APPROVED EROSION CONTROL BLANKETS (SC200B STRAW/COCONUT DOUBLE NET OR APPROVED EQUIVALENT) AT THE END OF EACH STAGE.
 - INSTALL LANDSCAPING MEASURES AS SHOWN ON DRAWINGS #RP.
 - REMOVE SEDIMENT CONTROL MEASURES.

DATE PLOTTED: 2024-04-24
PLOT SCALE: 1:0.0254
Z:\Projects\2020\20-722 - Stanley Pit Flood Study & Channel Design\05_Drawings\CAD\20-722-Stanley Pit_Base_2D.dgn



NOTES

- ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
- CONTOUR INTERVAL IS 0.25m.
- TOPOGRAPHIC SURVEY INFORMATION:
COORDINATE SYSTEM: UTM ZONE 17 N (GRID)
HORIZONTAL DATUM: NAD83 (CSRS - 2010)
VERTICAL DATUM: CGG2013
VERTICAL CONTROL: OBSERVED GPS ELEVATIONS
- ALL DIMENSIONS SHALL BE CHECKED AND VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO ANY CONSTRUCTION, AND ANY DISCREPANCIES SHALL BE REPORTED IMMEDIATELY TO THE PROJECT ENGINEER.
- ALL WORK SHALL BE IN ACCORDANCE WITH CURRENT CITY OF LONDON STANDARD SPECIFICATIONS AND DRAWINGS UNLESS OTHERWISE NOTED HEREIN.
- ORDER OF PRECEDENCE OF STANDARDS DRAWINGS IS FIRSTLY CITY OF LONDON AND SECONDLY ONTARIO PROVINCIAL STANDARDS (OPSD).
- THE CONTRACTOR TO BE RESPONSIBLE FOR LOCATION OF ALL EXISTING U/G AND OVERHEAD UTILITIES. CONTRACTOR IS REQUIRED TO OBTAIN ALL LOCATIONS & NOTIFY THE VARIOUS UTILITY COMPANIES 72 HOURS PRIOR TO THE COMMENCEMENT OF ANY WORK. THE MUNICIPALITY OF MIDDLESEX CENTRE AND CONSULTANT ASSUMES NO RESPONSIBILITY FOR THE LOCATIONS OF EXISTING UTILITIES AS INDICATED ON THE DRAWING.

BENCHMARK
ELEVATIONS ARE BASED ON GPS OBSERVATIONS FROM PERMANENT REFERENCE STATIONS IN THE NAD83 (CSRS-2010) COORDINATE SYSTEM, WITH HEIGHTS CONVERTED TO ORTHOMETRIC ELEVATIONS ON THE CGVD28 DATUM (1978 ADJUSTMENT) WITH GEOID MODEL CGG2013, AS SUPPLIED BY NATURAL RESOURCES CANADA.

CONTROL POINT 1:
ELEV: 292.56m
NORTHING: 4777805.8940
EASTING: 474206.5790
LOCATION: CROSS IN CONCRETE BY BRIDGE ON FIFTEEN MILE ROAD

COMPLETED BY:
GRECK AND ASSOCIATES LIMITED
SURVEY COMPLETED ON THE 4th & 5th DAYS OF NOVEMBER, 2020.

LEGEND

— 292.00 —	CONTOUR MAJOR 0.25m INTERVAL	— 292.25 —	CONTOUR MINOR 0.25m INTERVAL
- - - 292.00 - - -	LIDAR CONTOUR MAJOR 0.25m INTERVAL	- - - 292.25 - - -	LIDAR CONTOUR MINOR 0.25m INTERVAL
(Tree symbol)	EXISTING DECIDUOUS TREE	(Wavy line symbol)	EXISTING WOODY FEATURE
(Dashed line symbol)	LIMIT OF EARTH WORKS	(Dotted line symbol)	SITE ACCESS ROUTE
(Orange line symbol)	PROPOSED 30m ENVIRONMENTAL BUFFER	(Hatched pattern symbol)	PROPOSED RIFFLE
(Blue hatched pattern symbol)	PROPOSED POOL	(Grey hatched pattern symbol)	TEMPORARY MUD MAT
(Circle with 'DW' symbol)	TEMPORARY DEWATERING PUMP	(Circle with 'FB' symbol)	TEMPORARY FLOW BY-PASS PUMP
(Square with 'E' symbol)	TEMPORARY ENERGY DISSIPATION PAD	(Circle with 'S' symbol)	TEMPORARY SEDIMENT DEWATERING BAG
(Dashed line with 'F' symbol)	TEMPORARY SEDIMENT CONTROL FENCE	(Circle with 'S' symbol)	TEMPORARY SILT SOCK
(Hatched pattern symbol)	PROPOSED FILL	(Hatched pattern symbol)	PROPOSED CUT

CLIENT NAME:
McCann Redi-Mix Inc.



5770 Highway 7, Unit 3, Woodbridge, Ontario L4L 1T8		
DATE	REVISION	BY
MAY 29, 2023	30% DESIGN ISSUED FOR REVIEW	B.G.
APRIL XX, 2024	ISSUED FOR APPROVALS	B.G.

SUBMISSION DRAWING
NOT FOR CONSTRUCTION

STANLEY PIT FLOOD STUDY & NATURAL CHANNEL DESIGN

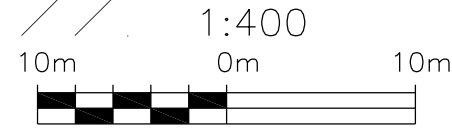
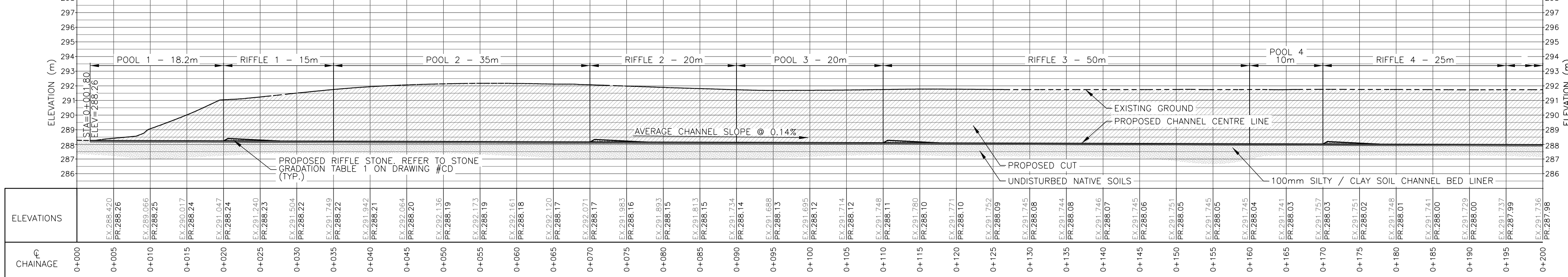
EROSION AND SEDIMENTS CONTROL STAGING PLAN

DATE:	APRIL 2024	DESIGN BY:	B.G.	DWG. BY:	P.G.	APPD. BY:	B.G.
SCALE:	1:1000	DRAWING NO.:	ESC-2	PROJECT NO.:	20-722		
0m 20m 40m		SHEET NO. 3					

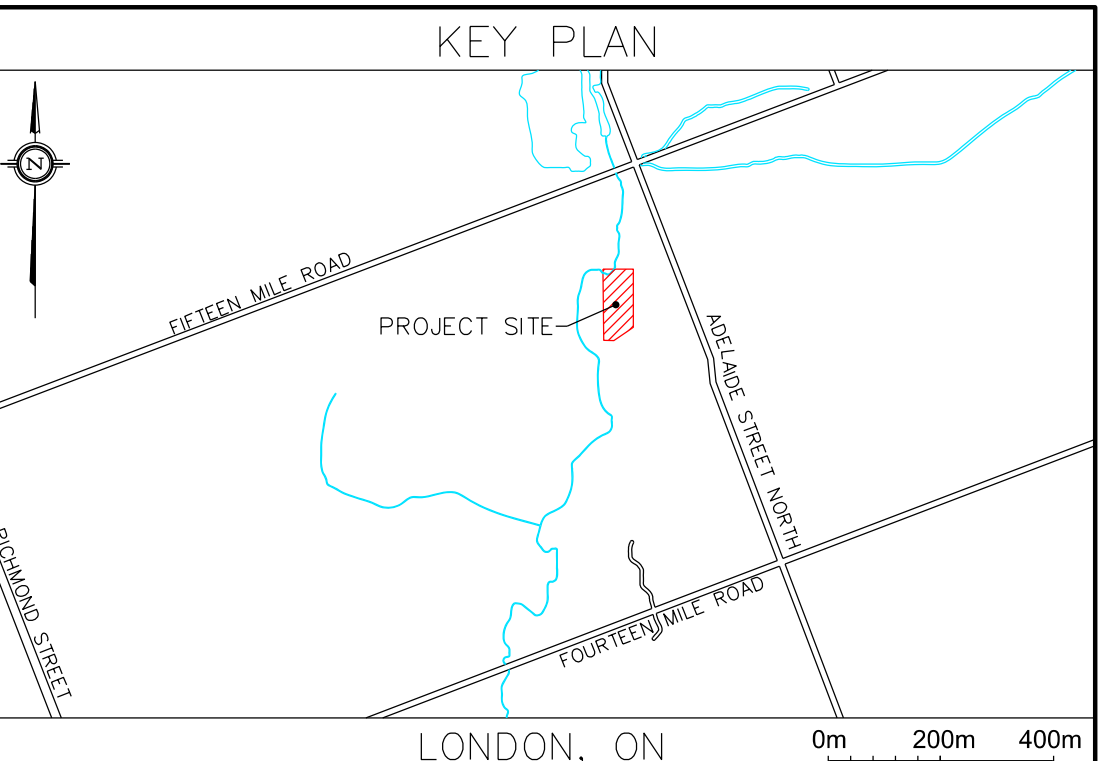
Z:\Projects\2020\20-722-Stanley Pit Flood Study & Channel Design\05_Drawings\CAD\20-722-Stanley Pit_Base_2D.dgn DATE PLOTTED: 2024-04-24 PLOT SCALE: 1:0.0254



CHANNEL PROFILE ALONG CENTRELINE 2H:1V FROM STA. 0+000 - 0+200



Station	Channel Section	Downstream direction
0+000	0+020 Pool	Right
0+020	0+025 Riffle	Left
0+035	0+065 Pool	Left
0+070	0+075 Riffle	Right
0+090	0+110 Pool	Right
0+110	0+115 Riffle	Right
0+160	0+170 Pool	Right
0+170	0+175 Riffle	Right
0+195	0+230 Pool	Right
0+230	0+235 Riffle	Right



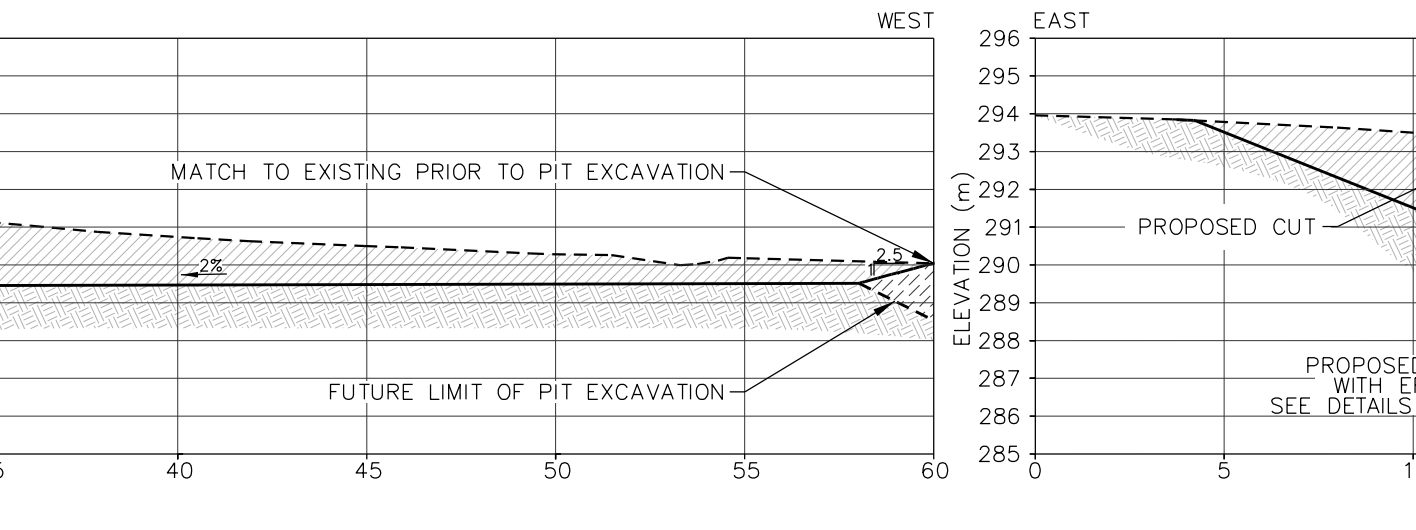
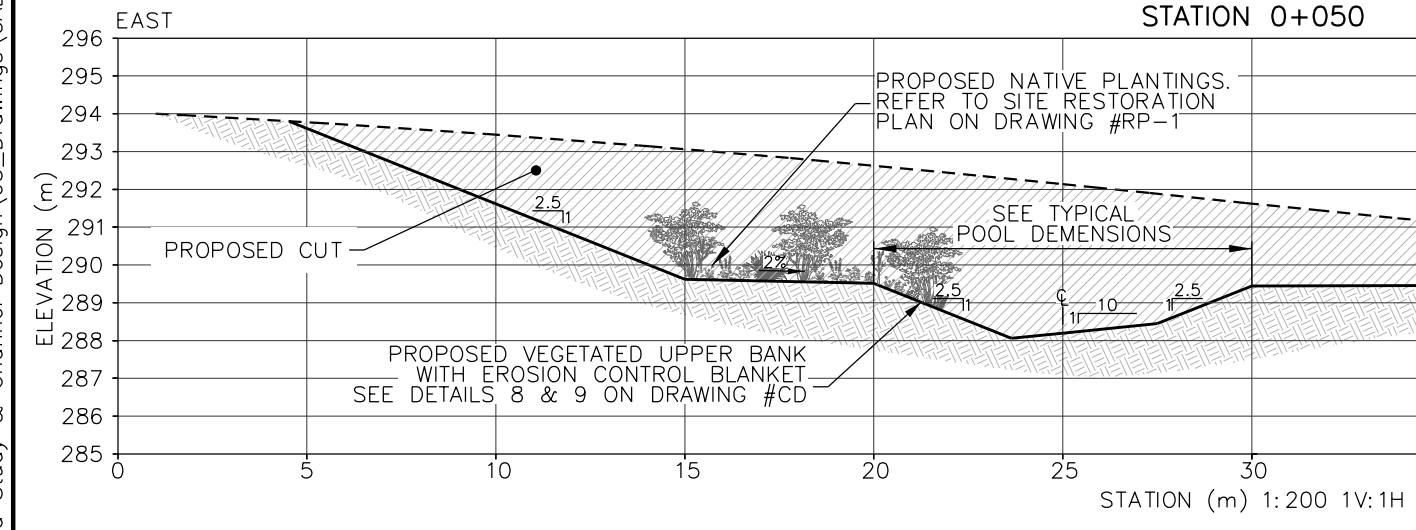
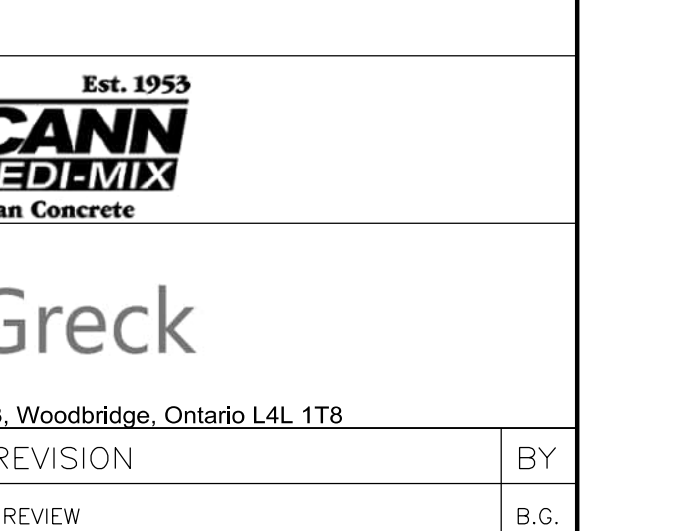
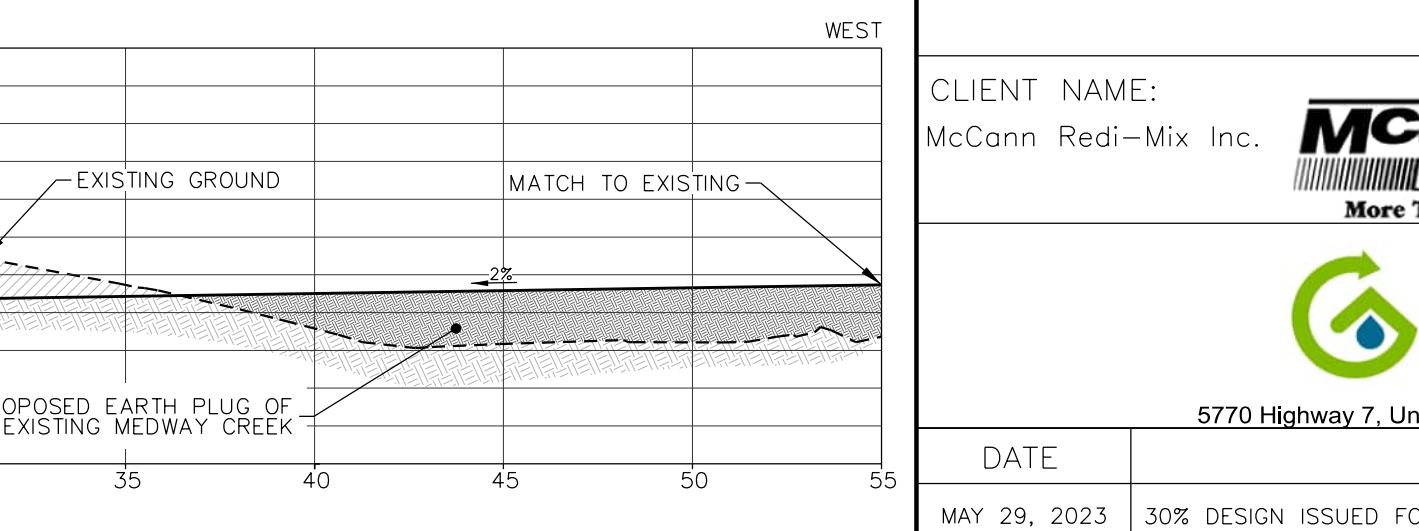
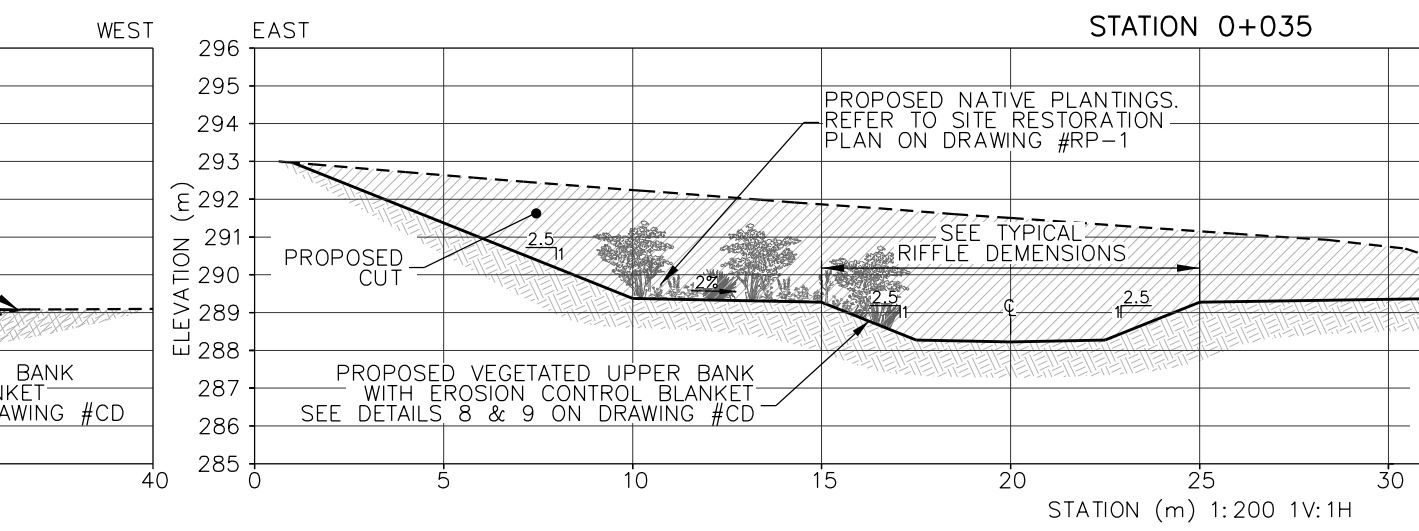
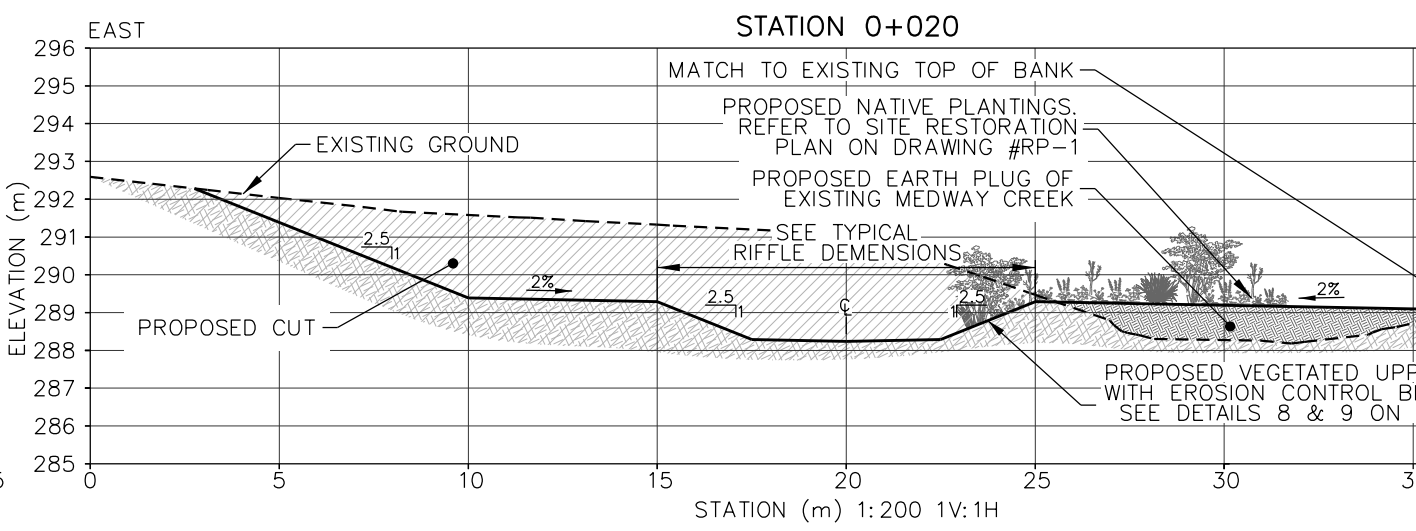
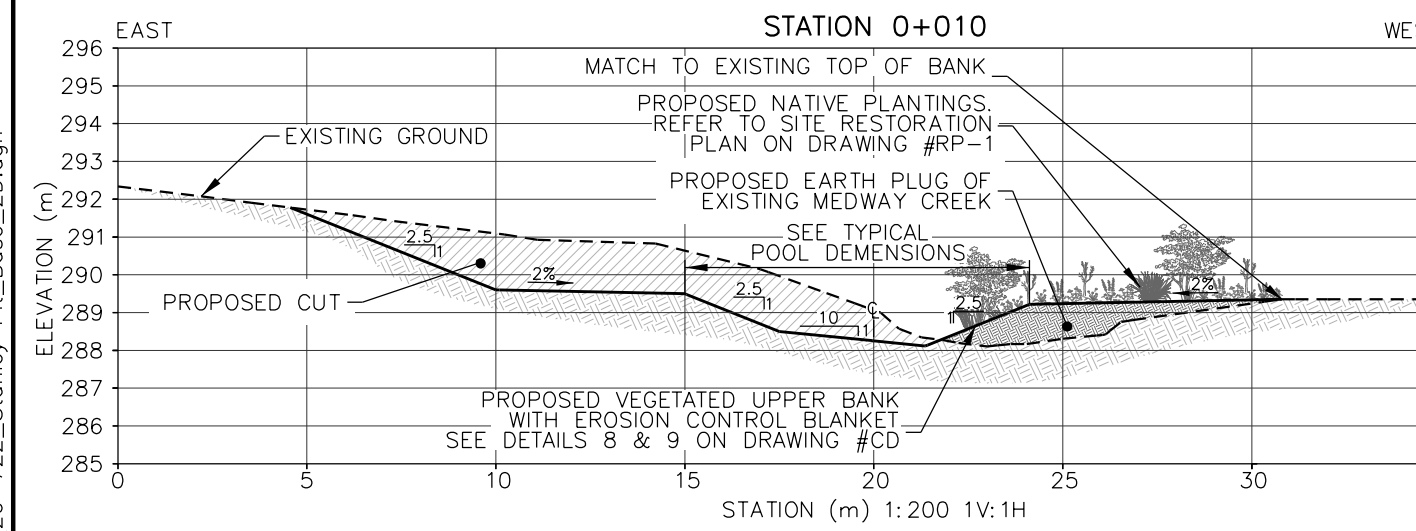
- NOTES**
- ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
 - CONTOUR INTERVAL IS 0.25m.
 - TOPOGRAPHIC SURVEY INFORMATION:
COORDINATE SYSTEM: UTM ZONE 17 N (GRID)
HORIZONTAL DATUM: NAD83 (CSRS - 2010)
VERTICAL DATUM: CGG2013
VERTICAL CONTROL: OBSERVED GPS ELEVATIONS
 - ALL DIMENSIONS SHALL BE CHECKED AND VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO ANY CONSTRUCTION, AND ANY DISCREPANCIES SHALL BE REPORTED IMMEDIATELY TO THE PROJECT ENGINEER.
 - ALL WORK SHALL BE IN ACCORDANCE WITH CURRENT CITY OF LONDON STANDARD SPECIFICATIONS AND DRAWINGS UNLESS OTHERWISE NOTED HEREIN.
 - ORDER OF PRECEDENCE OF STANDARDS DRAWINGS IS FIRSTLY CITY OF LONDON AND SECONDLY ONTARIO PROVINCIAL STANDARDS (OPS).
 - THE CONTRACTOR TO BE RESPONSIBLE FOR LOCATION OF ALL EXISTING U/G AND OVERHEAD UTILITIES. CONTRACTOR IS REQUIRED TO OBTAIN ALL LOCATIONS & NOTIFY THE VARIOUS UTILITY COMPANIES 72 HOURS PRIOR TO THE COMMENCEMENT OF ANY WORK. THE MUNICIPALITY OF MIDDLESEX CENTRE AND CONSULTANT ASSUMES NO RESPONSIBILITY FOR THE LOCATIONS OF EXISTING UTILITIES AS INDICATED ON THE DRAWING.

BENCHMARK
ELEVATIONS ARE BASED ON GPS OBSERVATIONS FROM PERMANENT REFERENCE STATIONS IN THE NAD83 (CSRS-2010) COORDINATE SYSTEM, WITH HEIGHTS CONVERTED TO ORTHOMETRIC ELEVATIONS ON THE CGVD28 DATUM (1978 ADJUSTMENT) WITH GEOID MODEL CGG2013, AS SUPPLIED BY NATURAL RESOURCES CANADA.

CONTROL POINT 1:
ELEV: 292.56m
NORTHING: 4777805.8940
EASTING: 474206.5790
LOCATION: CROSS IN CONCRETE BY BRIDGE ON FIFTEEN MILE ROAD

COMPLETED BY:
GRECK AND ASSOCIATES LIMITED
SURVEY COMPLETED ON THE 4th & 5th DAYS OF NOVEMBER, 2020.

- LEGEND**
- WATERLINE AT TIME OF SURVEY
 - CONTOUR MAJOR - 0.25m INTERVAL
 - CONTOUR MINOR - 0.25m INTERVAL
 - EXISTING DECIDUOUS TREE
 - EXISTING WOODY FEATURE
 - LIMIT OF EARTH WORKS
 - PROPOSED NATIVE PLANTINGS
 - PROPOSED 30m ENVIRONMENTAL BUFFER
 - PROPOSED RIFFLE
 - PROPOSED POOL
 - PROPOSED AGGREGATE EXTRACTION AREA
 - 2005-BH-XXX 2022-BH-X



CLIENT NAME: McCann Redi-Mix Inc.

5770 Highway 7, Unit 3, Woodbridge, Ontario L4L 1T8

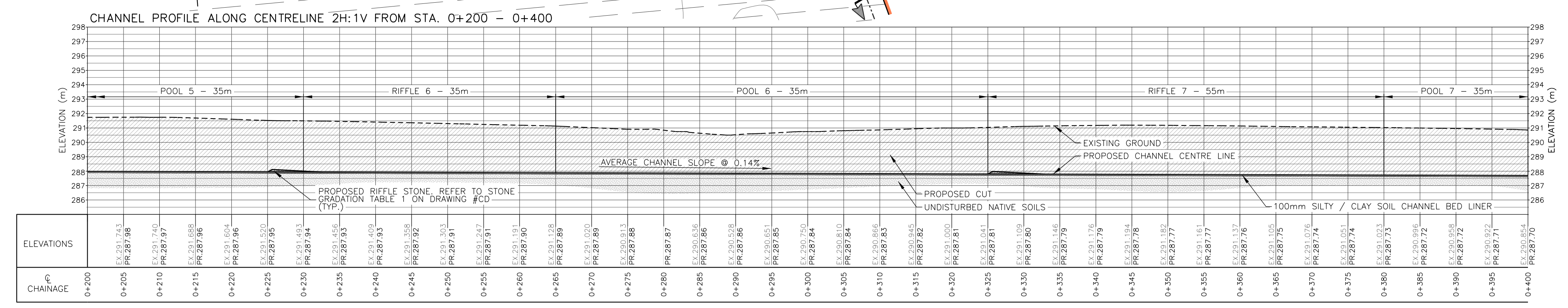
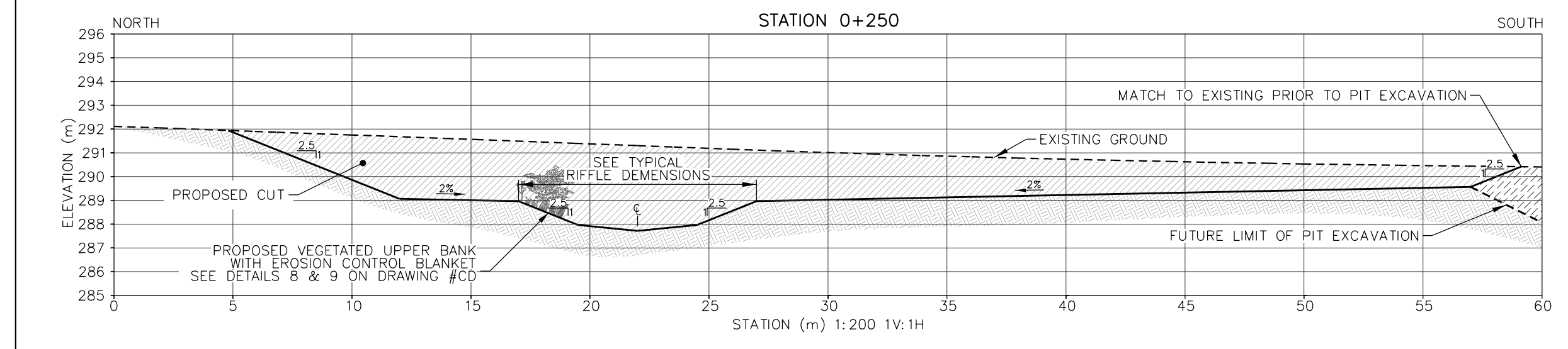
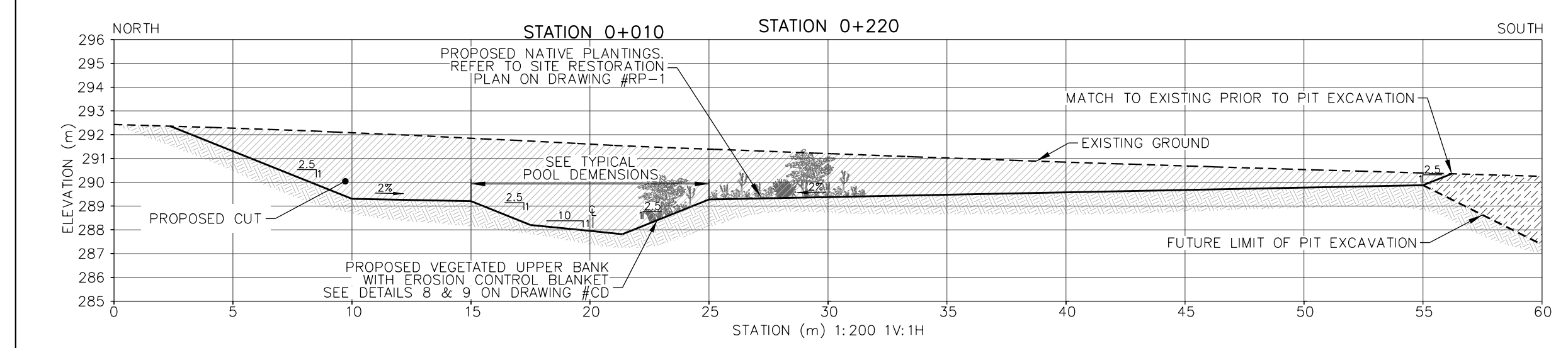
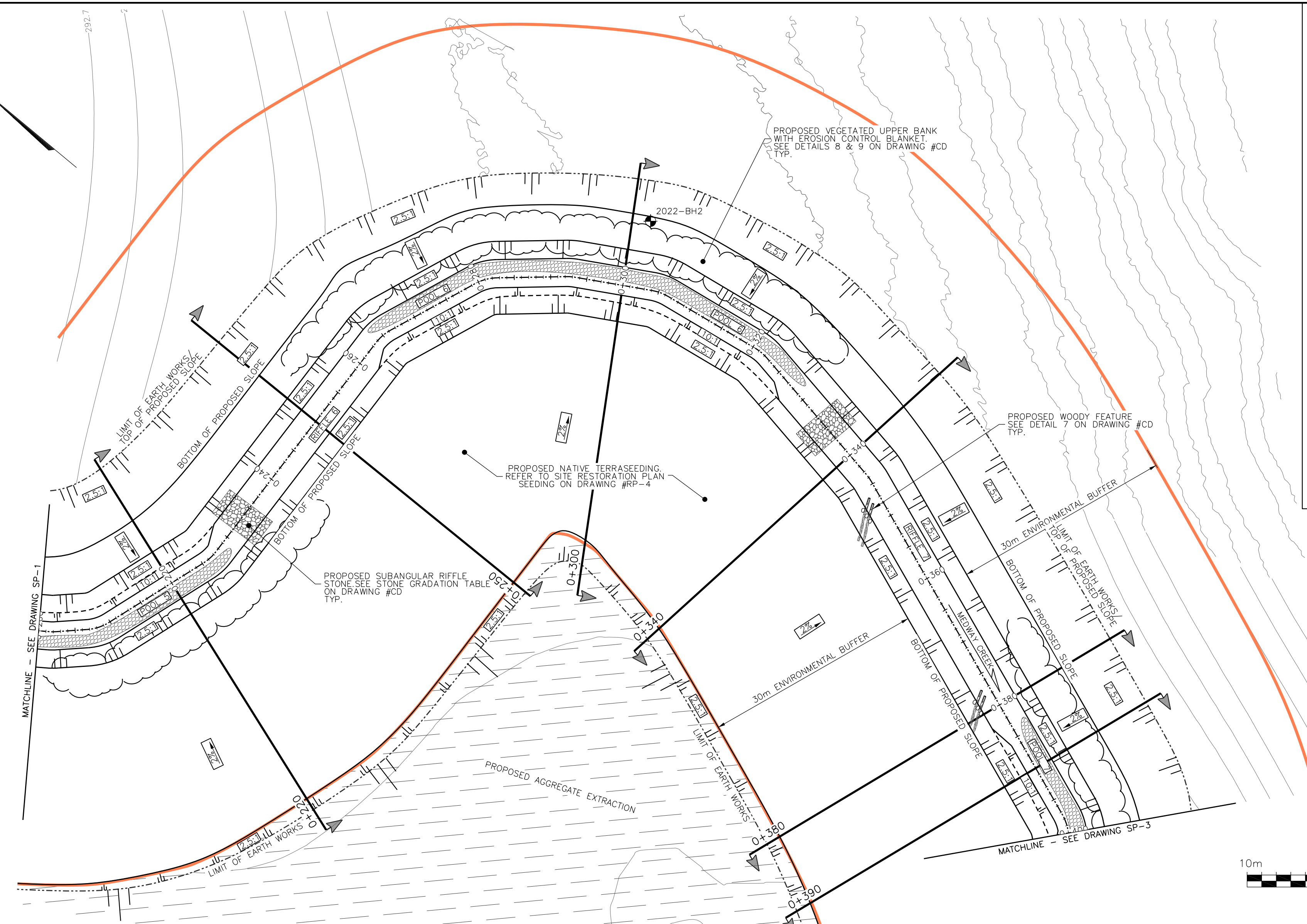
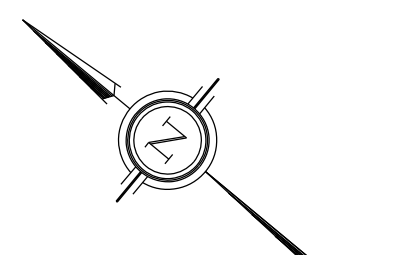
DATE	REVISION	BY
MAY 29, 2023	30% DESIGN ISSUED FOR REVIEW	B.G.
APRIL XX, 2024	ISSUED FOR APPROVALS	B.G.

SUBMISSION DRAWING
NOT FOR CONSTRUCTION

STANLEY PIT FLOOD STUDY & NATURAL CHANNEL DESIGN
SITE PLAN, PROFILE AND SECTIONS
STA. 0+000 TO 0+200

DATE: APRIL 2024	DESIGN BY: B.G.	DWG. BY: P.G.	APPD. BY: B.G.
SCALE: AS SHOWN	DRAWING NO: SP-1	PROJECT NO: 20-722	SHEET NO. 4

DATE PLOTTED: 2024-04-24
PLOT SCALE: 1:0.0254
Z:\Projects\2020\20-722 - Stanley Pit Flood Study & Channel Design\05_Drawings\CAD\20-722-Stationary_Pit_Base_2D.dgn



Station	Channel Section	Downstream direction
0+230	0+235 Riffle	Left
0+265	0+330 Pool	Left
0+335	0+340 Riffle	Left
0+385	0+405 Pool	Left

BENCHMARK
ELEVATIONS ARE BASED ON GPS OBSERVATIONS FROM PERMANENT REFERENCE STATIONS IN THE NAD83 (CSRS-2010) COORDINATE SYSTEM, WITH HEIGHTS CONVERTED TO ORTHOMETRIC ELEVATIONS ON THE CGVD28 DATUM (1978 ADJUSTMENT) WITH GEOID MODEL CGG2013, AS SUPPLIED BY NATURAL RESOURCES CANADA.

CONTROL POINT 1:
ELEV: 292.56m
NORTHING: 4777805.8940
EASTING: 474206.5790
LOCATION: CROSS IN CONCRETE BY BRIDGE ON FIFTEEN MILE ROAD

COMPLETED BY:
GRECK AND ASSOCIATES LIMITED
SURVEY COMPLETED ON THE 4th & 5th DAYS OF NOVEMBER, 2020.

LEGEND

- 292.00 CONTOUR MAJOR - 0.25m INTERVAL
- 292.25 CONTOUR MINOR - 0.25m INTERVAL
- 292.00 LIDAR CONTOUR MAJOR - 0.25m INTERVAL
- 292.25 LIDAR CONTOUR MINOR - 0.25m INTERVAL
- EXISTING WOODY FEATURE
- LIMIT OF EARTH WORKS
- PROPOSED NATIVE PLANTINGS
- PROPOSED 30m ENVIRONMENTAL BUFFER
- PROPOSED RIFFLE
- PROPOSED POOL
- PROPOSED AGGREGATE EXTRACTION AREA
- 2005-BH-XXX 2005 BOREHOLE
- 2022-BH-X 2022 BOREHOLE

CLIENT NAME:
McCann Redi-Mix Inc.

McCann
REDIMIX
More Than Concrete

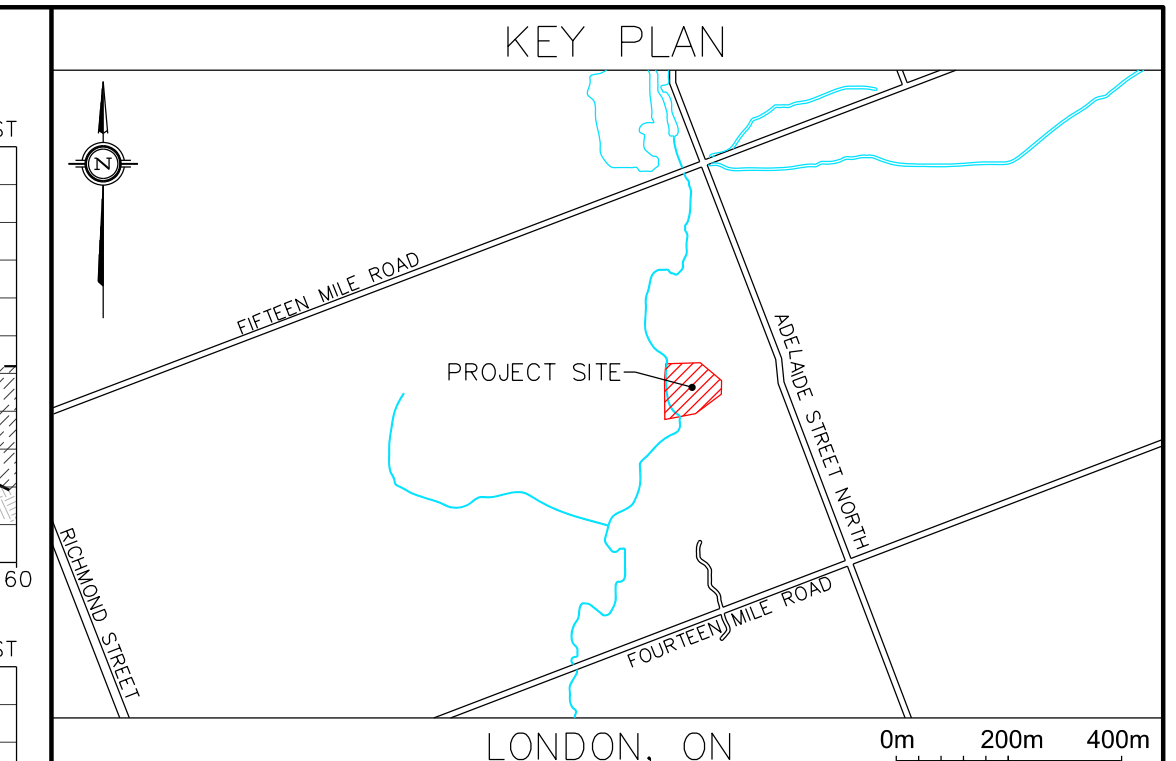
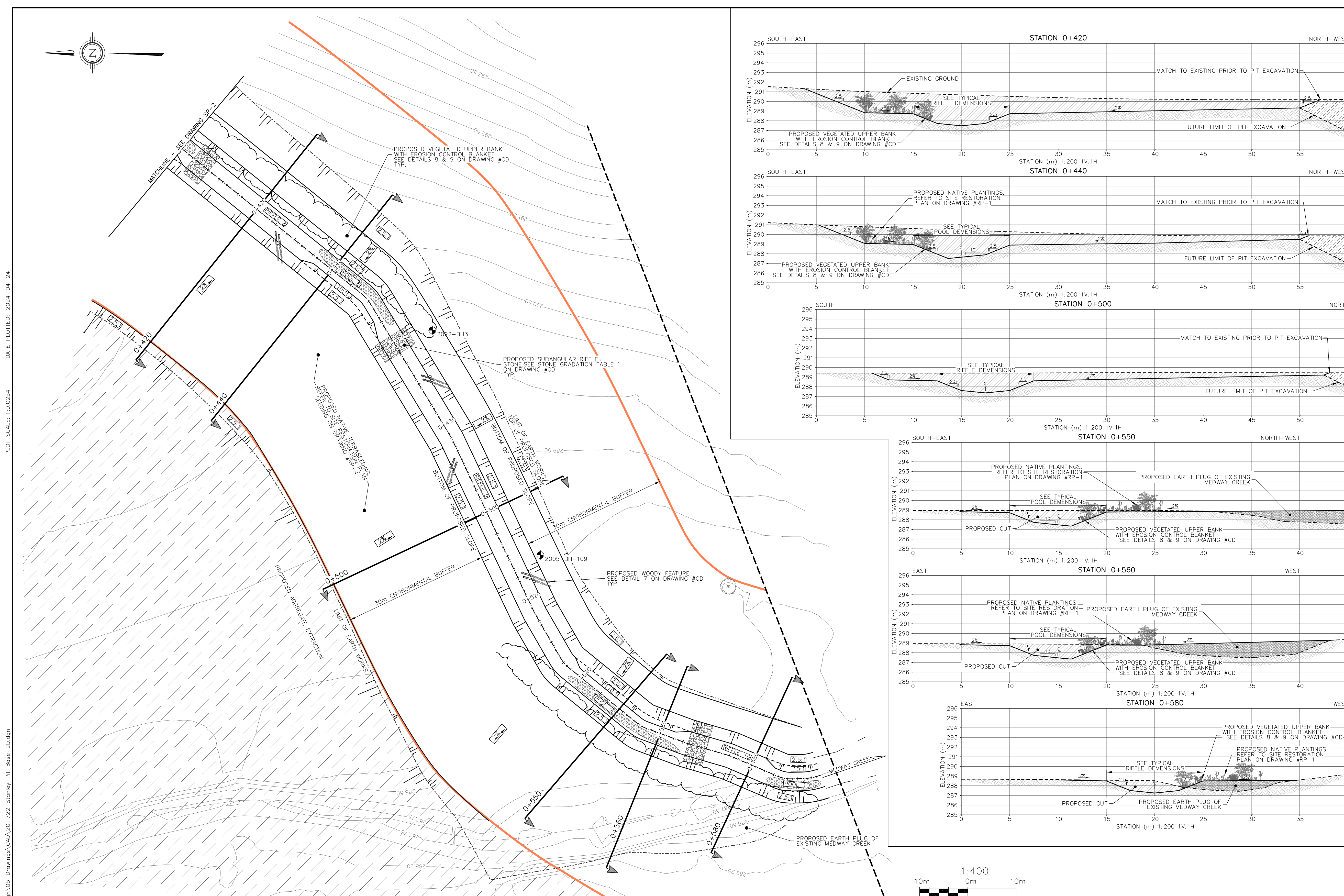
5770 Highway 7, Unit 3, Woodbridge, Ontario L4L 1T8

DATE	REVISION	BY
MAY 29, 2023	30% DESIGN ISSUED FOR REVIEW	B.G.
APRIL XX, 2024	ISSUED FOR APPROVALS	B.G.

SUBMISSION DRAWING
NOT FOR CONSTRUCTION

STANLEY PIT FLOOD STUDY & NATURAL CHANNEL DESIGN
SITE PLAN, PROFILE AND SECTIONS
STA. 0+200 TO 0+400

DATE: APRIL 2024	DESIGN BY: B.G.	DWG. BY: P.G.	APPD. BY: B.G.
SCALE: AS SHOWN	DRAWING NO: SP-2	PROJECT NO: 20-722	SHEET NO. 5



- NOTES**
- ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
 - CONTOUR INTERVAL IS 0.25m.
 - TOPOGRAPHIC SURVEY INFORMATION:
COORDINATE SYSTEM: UTM ZONE 17 N (GRID)
HORIZONTAL DATUM: NAD83 (CSRS - 2010)
VERTICAL DATUM: CGG2013
VERTICAL CONTROL: OBSERVED SP5 ELEVATIONS
 - ALL DIMENSIONS SHALL BE CHECKED AND VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO ANY CONSTRUCTION, AND ANY DISCREPANCIES SHALL BE REPORTED IMMEDIATELY TO THE PROJECT ENGINEER.
 - ALL WORK SHALL BE IN ACCORDANCE WITH CURRENT CITY OF LONDON STANDARD SPECIFICATIONS AND DRAWINGS UNLESS OTHERWISE NOTED HEREIN.
 - ORDER OF PRECEDENCE OF STANDARDS DRAWINGS IS FIRSTLY CITY OF LONDON AND SECONDLY ONTARIO PROVINCIAL STANDARDS (OPSD).
 - THE CONTRACTOR TO BE RESPONSIBLE FOR LOCATION OF ALL EXISTING U/G AND OVERHEAD UTILITIES. CONTRACTOR IS REQUIRED TO OBTAIN ALL LOCATIONS & NOTIFY THE VARIOUS UTILITY COMPANIES 72 HOURS PRIOR TO THE COMMENCEMENT OF ANY WORK. THE MUNICIPALITY OF MIDDLESEX CENTRE AND CONSULTANT ASSUMES NO RESPONSIBILITY FOR THE LOCATIONS OF EXISTING UTILITIES AS INDICATED ON THE DRAWING.

BENCHMARK
ELEVATIONS ARE BASED ON GPS OBSERVATIONS FROM PERMANENT REFERENCE STATIONS IN THE NAD83 (CSRS-2010) COORDINATE SYSTEM, WITH HEIGHTS CONVERTED TO ORTHOMETRIC ELEVATIONS ON THE CGVD28 DATUM (1978 ADJUSTMENT) WITH GEOID MODEL CGG2013, AS SUPPLIED BY NATURAL RESOURCES CANADA.

CONTROL POINT 1:
ELEV: 292.56m
NORTHING: 4777805.8940
EASTING: 474206.5790
LOCATION: CROSS IN CONCRETE BY BRIDGE ON FIFTEEN MILE ROAD

COMPLETED BY:
GRECK AND ASSOCIATES LIMITED
SURVEY COMPLETED ON THE 4th & 5th DAYS OF NOVEMBER, 2020.

- LEGEND**
- APPROXIMATE PARCEL FABRIC
 - WATERLINE AT TIME OF SURVEY
 - CONTOUR MAJOR - 0.25m INTERVAL
 - CONTOUR MINOR - 0.25m INTERVAL
 - EXISTING DECIDUOUS TREE
 - EXISTING WOODY FEATURE
 - LIMIT OF EARTH WORKS
 - PROPOSED NATIVE PLANTINGS
 - PROPOSED 30m ENVIRONMENTAL BUFFER
 - PROPOSED RIFFLE
 - PROPOSED POOL
 - PROPOSED AGGREGATE EXTRACTION AREA
 - 2005-BH-XXX
 - 2022-BH-X

CLIENT NAME:
McCann Redi-Mix Inc.

McCann REDIMIX
More Than Concrete

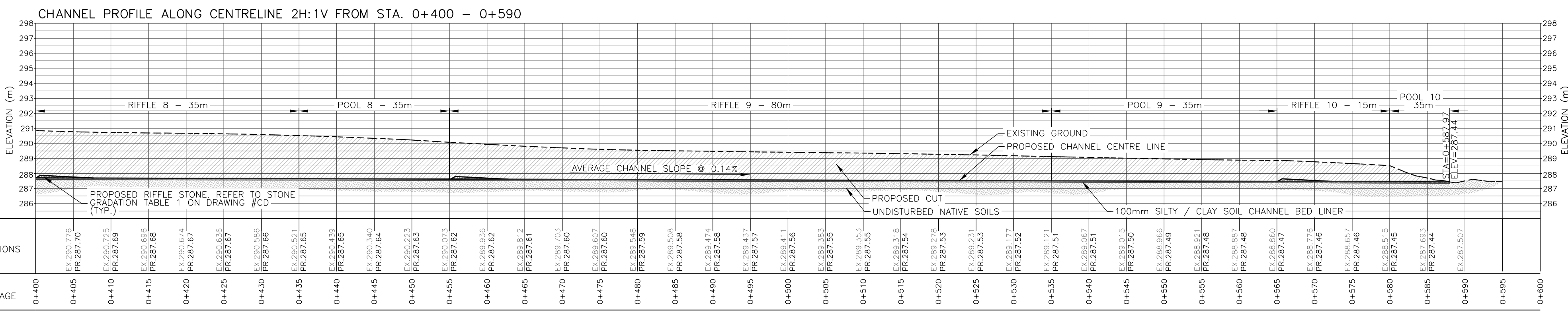
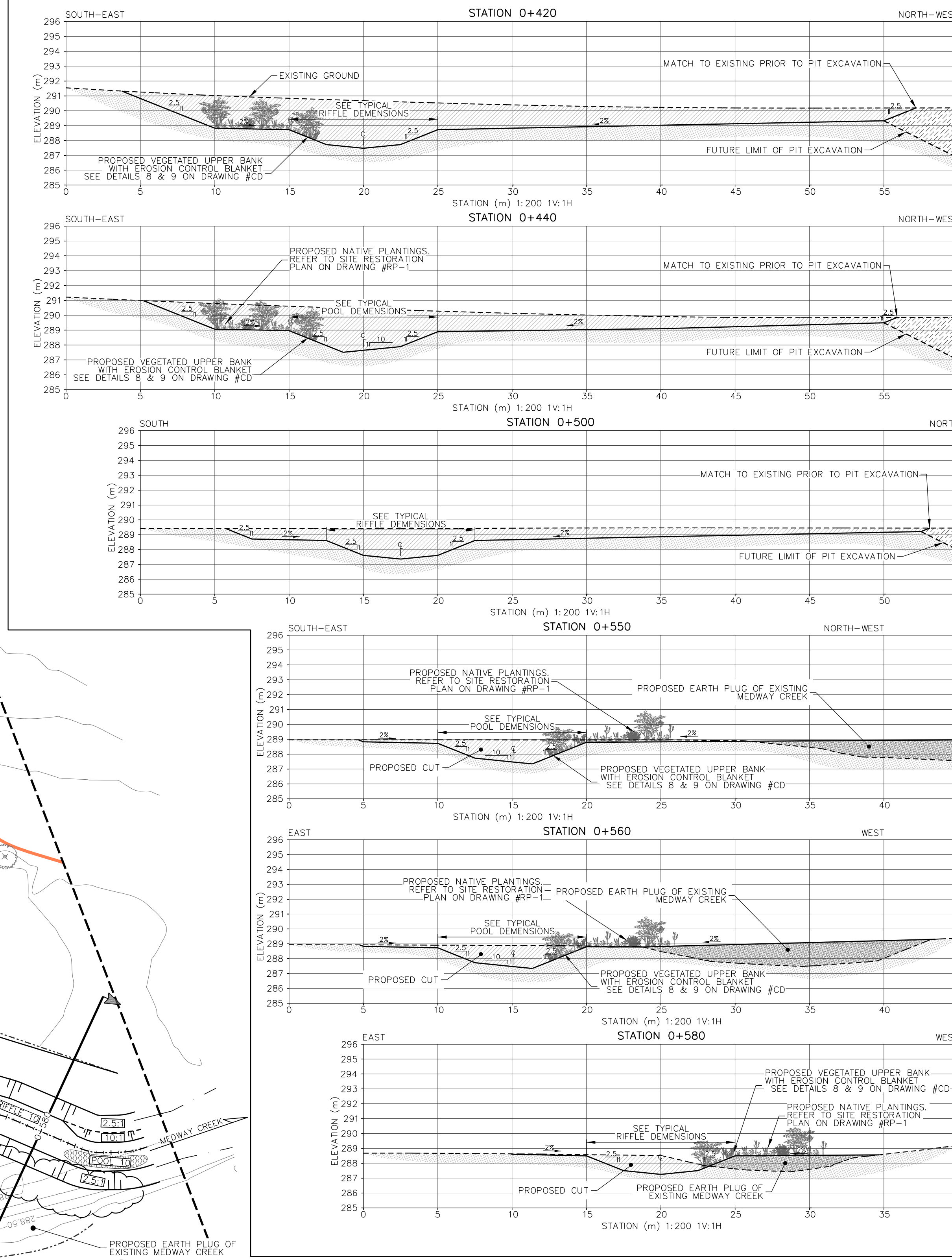
Greck
5770 Highway 7, Unit 3, Woodbridge, Ontario L4L 1T8

DATE	REVISION	BY
MAY 29, 2023	30% DESIGN ISSUED FOR REVIEW	B.G.
APRIL XX, 2024	ISSUED FOR APPROVALS	B.G.

SUBMISSION DRAWING
NOT FOR CONSTRUCTION

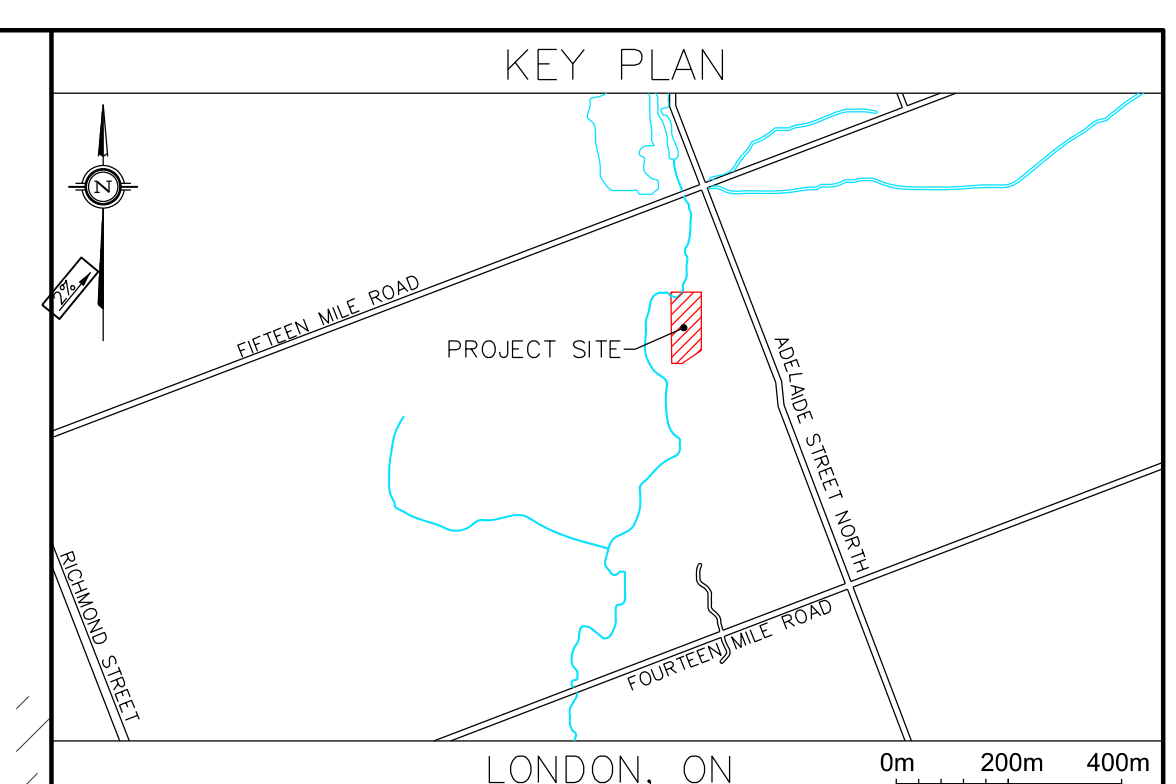
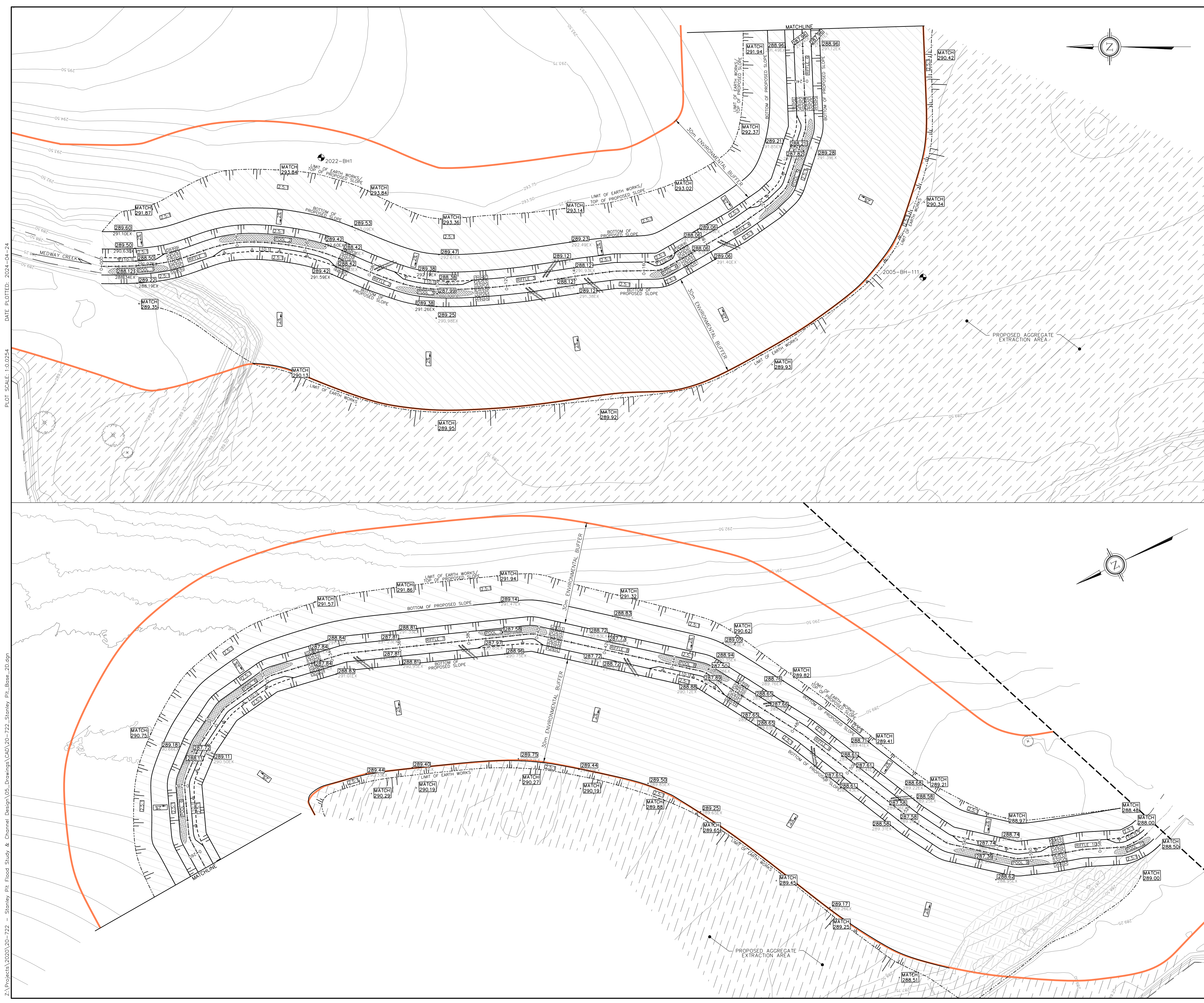
STANLEY PIT FLOOD STUDY & NATURAL CHANNEL DESIGN
SITE PLAN, PROFILE AND SECTIONS
STA. 0+400 TO 0+590

DATE:	APRIL 2024	DESIGN BY:	B.G.	DWG. BY:	P.G.	APPD. BY:	B.G.
SCALE:	AS SHOWN	DRAWING NO.:	SP-3	PROJECT NO.:	20-722	SHEET NO. 6	



Station	Channel Section	Downstream direction
0+405	0+410	Riffle
0+435	0+455	Pool
0+460	0+465	Riffle
0+535	0+565	Pool
0+565	0+570	Riffle

Z:\Projects\2020\20-722 - Stanley Pit Flood Study & Channel Design\05_Drawings\CAD\20-722-Stanley_Pit_Base_2D.dgn
 DATE PLOTTED: 2024-04-24
 PLOT SCALE: 1:0.0254



- NOTES**
1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
 2. CONTOUR INTERVAL IS 0.25m.
 3. TOPOGRAPHIC SURVEY INFORMATION:
COORDINATE SYSTEM: UTM ZONE 17 N (GRID)
HORIZONTAL DATUM: NAD83 (CSRS - 2010)
VERTICAL DATUM: CGG2013
VERTICAL CONTROL: OBSERVED GPS ELEVATIONS
 4. ALL DIMENSIONS SHALL BE CHECKED AND VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO ANY CONSTRUCTION, AND ANY DISCREPANCIES SHALL BE REPORTED IMMEDIATELY TO THE PROJECT ENGINEER.
 5. ALL WORK SHALL BE IN ACCORDANCE WITH CURRENT CITY OF LONDON STANDARD SPECIFICATIONS AND DRAWINGS UNLESS OTHERWISE NOTED HEREIN.
 6. ORDER OF PRECEDENCE OF STANDARDS DRAWINGS IS FIRSTLY CITY OF LONDON AND SECONDLY ONTARIO PROVINCIAL STANDARDS (OPSD).
 7. THE CONTRACTOR TO BE RESPONSIBLE FOR LOCATION OF ALL EXISTING U/G AND OVERHEAD UTILITIES. CONTRACTOR IS REQUIRED TO OBTAIN ALL LOCATIONS & NOTIFY THE VARIOUS UTILITY COMPANIES 72 HOURS PRIOR TO THE COMMENCEMENT OF ANY WORK. THE MUNICIPALITY OF MIDDLESEX CENTRE AND CONSULTANT ASSUMES NO RESPONSIBILITY FOR THE LOCATIONS OF EXISTING UTILITIES AS INDICATED ON THE DRAWING.

BENCHMARK
ELEVATIONS ARE BASED ON GPS OBSERVATIONS FROM PERMANENT REFERENCE STATIONS IN THE NAD83 (CSRS-2010) COORDINATE SYSTEM, WITH HEIGHTS CONVERTED TO ORTHOMETRIC ELEVATIONS ON THE CGVD28 DATUM (1978 ADJUSTMENT) WITH GEOID MODEL CGG2013, AS SUPPLIED BY NATURAL RESOURCES CANADA.

CONTROL POINT 1:
ELEV: 292.56m
NORTHING: 4777805.8940
EASTING: 474206.5790
LOCATION: CROSS IN CONCRETE BY BRIDGE ON FIFTEEN MILE ROAD

COMPLETED BY:
GRECK AND ASSOCIATES LIMITED
SURVEY COMPLETED ON THE 4th & 5th DAYS OF NOVEMBER, 2020.

- LEGEND**
- WATERLINE AT TIME OF SURVEY
 - CONTOUR MAJOR - 0.25m INTERVAL
 - CONTOUR MINOR - 0.25m INTERVAL
 - ⊙ EXISTING DECIDUOUS TREE
 - ⊙ EXISTING WOODY FEATURE
 - LIMIT OF EARTH WORKS
 - PROPOSED 30m ENVIRONMENTAL BUFFER
 - ▨ PROPOSED RIFFLE
 - ▨ PROPOSED POOL
 - ▨ PROPOSED AGGREGATE EXTRACTION AREA
 - ▨ PROPOSED FILL - ~570m³
 - ▨ PROPOSED CUT - ~46,560m³
 - EXISTING ELEVATION
 - PROPOSED ELEVATION

CLIENT NAME:
McCann Redi-Mix Inc. 

5770 Highway 7, Unit 3, Woodbridge, Ontario L4L 1T8

DATE	REVISION	BY
MAY 29, 2023	30% DESIGN ISSUED FOR REVIEW	B.G.
APRIL XX, 2024	ISSUED FOR APPROVALS	B.G.

**SUBMISSION
DRAWING
NOT FOR CONSTRUCTION**

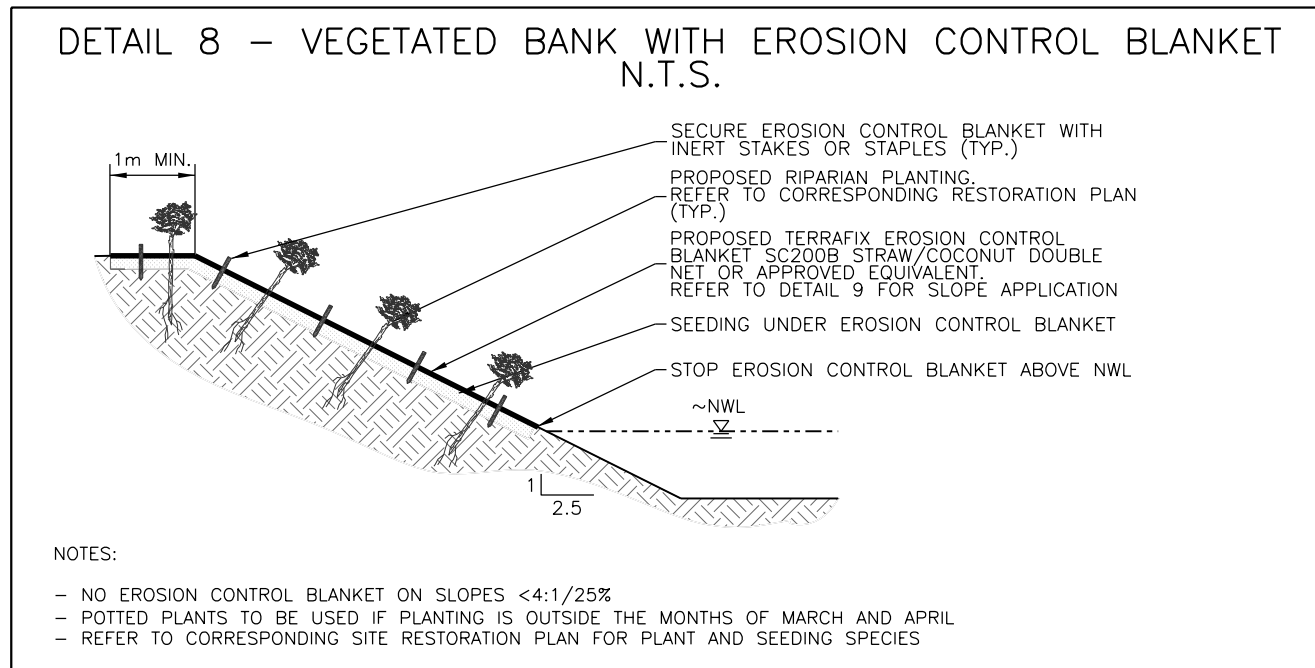
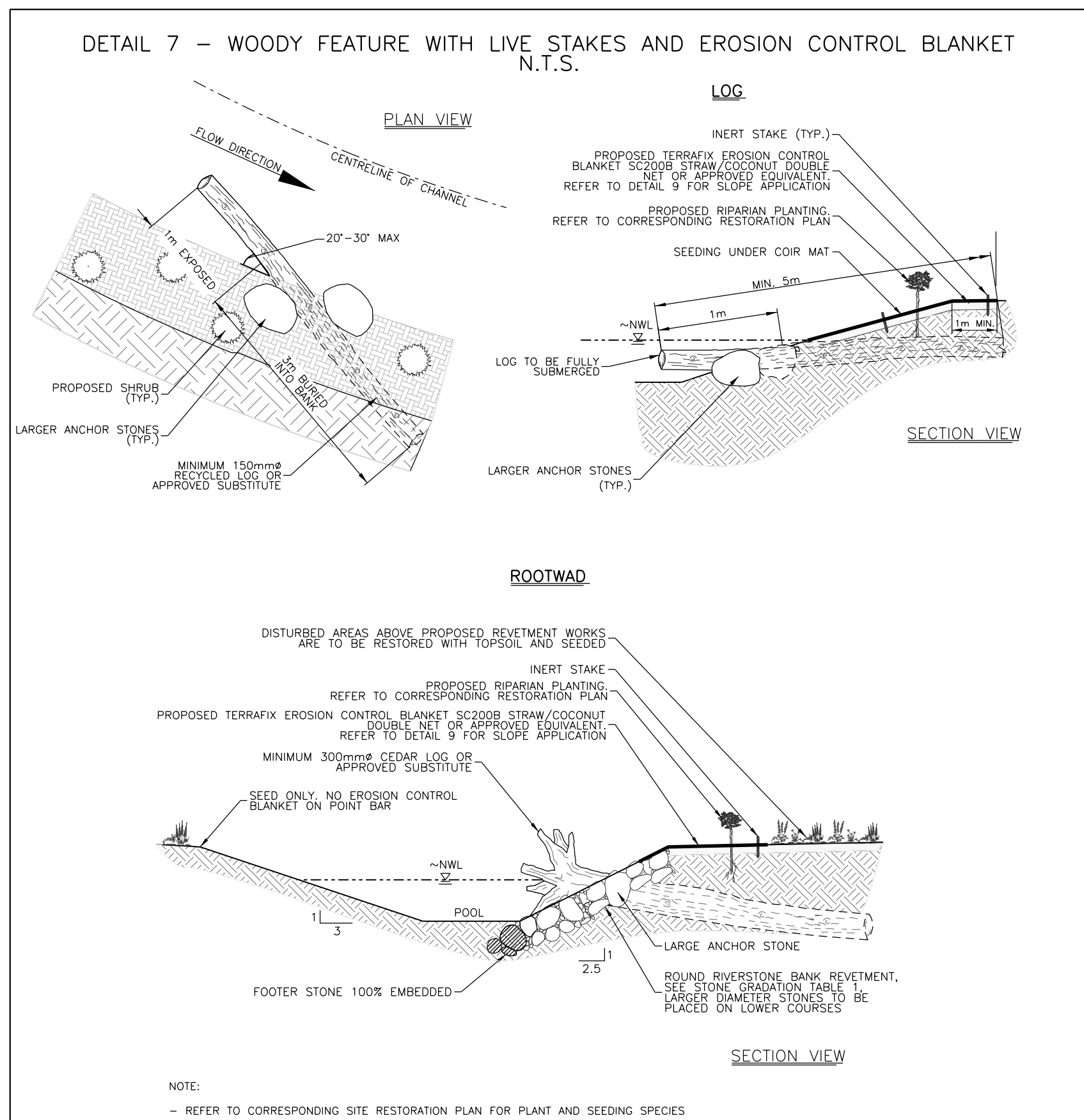
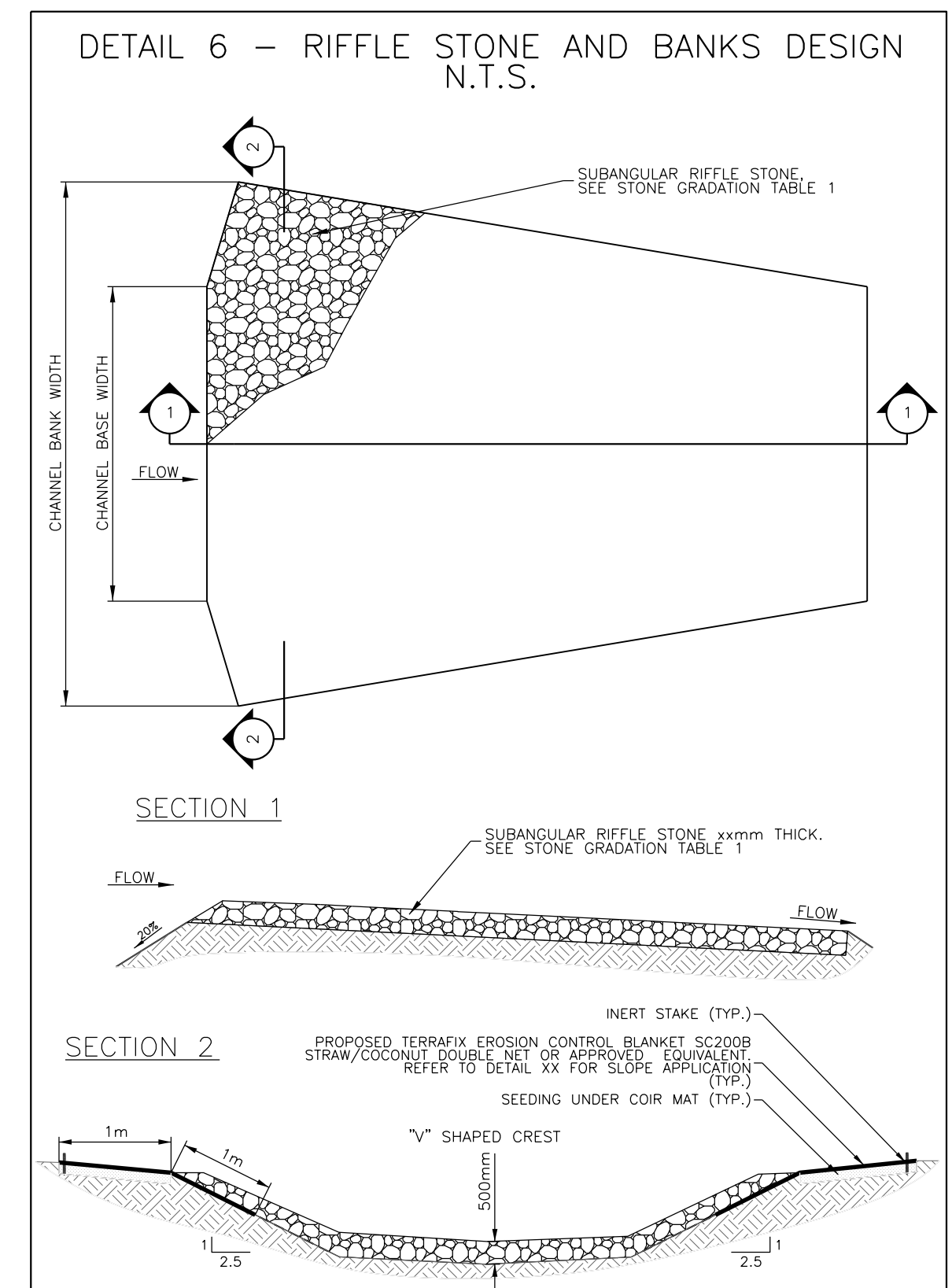
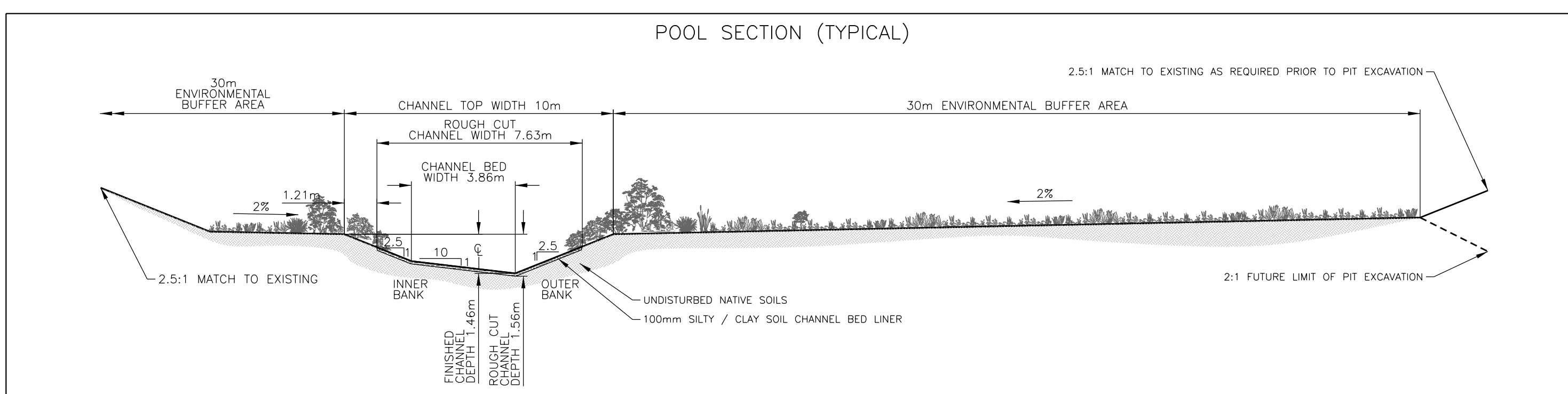
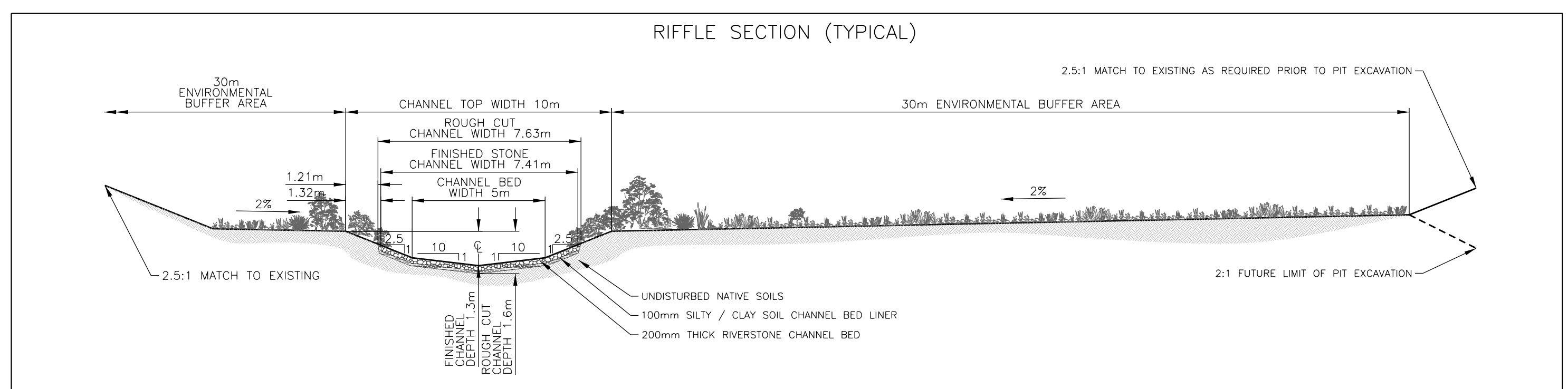
STANLEY PIT FLOOD STUDY & NATURAL CHANNEL DESIGN

GENERAL SITE GRADING PLAN

DATE: APRIL 2024	DESIGN BY: B.G.	DWG. BY: P.G.	APPD. BY: B.G.
SCALE: 1:500	DRAWING NO. SPG	PROJECT NO. 20-722	SHEET NO. 7

DATE PLOTTED: 2024-04-24
PLOT SCALE: 1:0.0254
Z:\Projects\2020\20-722 - Stanley Pit Flood Study & Channel Design\05_Drawings\CAD\20-722-Stanley Pit_Base_2D.dwg

DATE PLOTTED: 2024-04-24 PLOT SCALE: 1:0.0254 Z:\Projects\2020\20-722-Stanley Pit Flood Study & Channel Design\05_Drawings\CAD\20-722-Stanley Pit_Base_2D.dwg

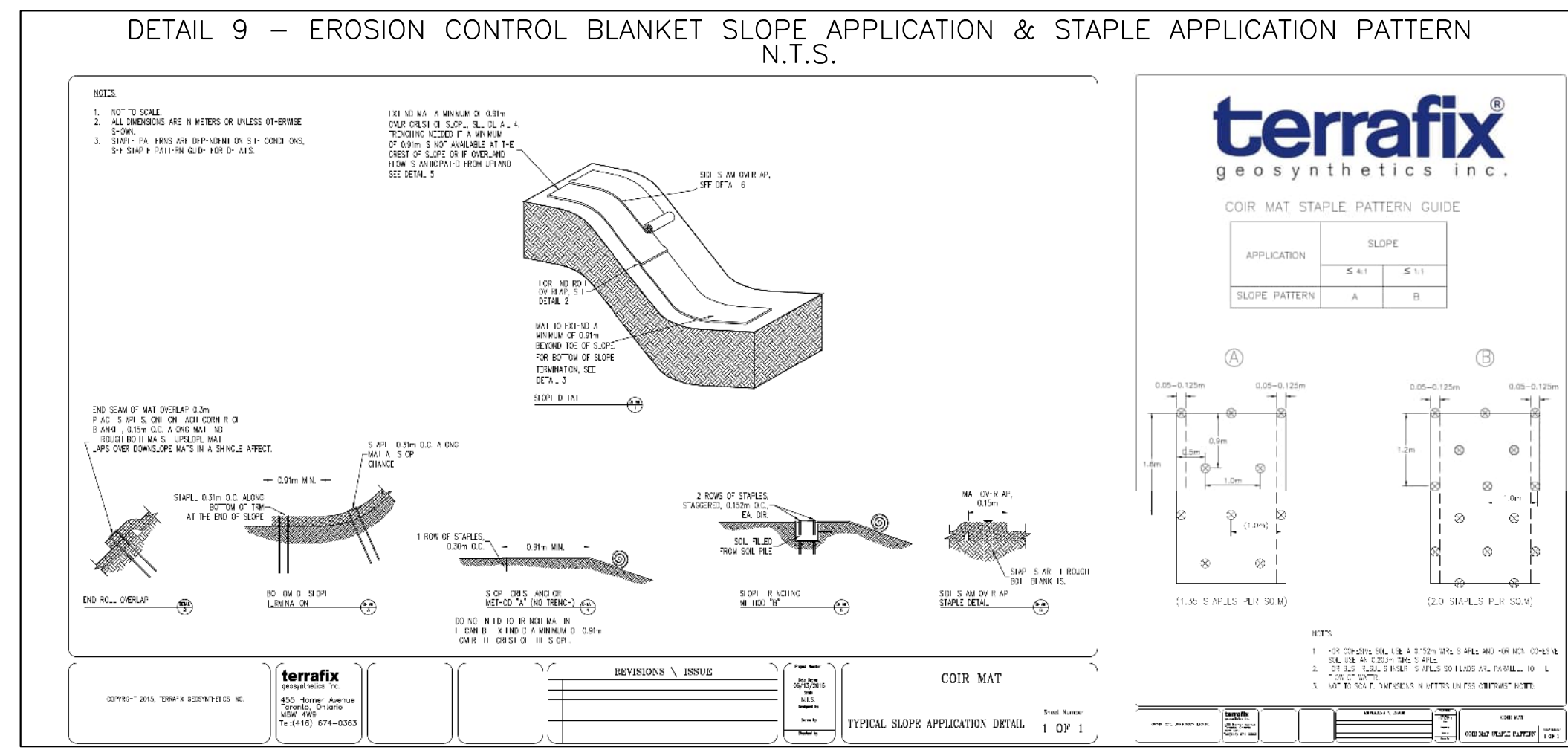


STONE GRADATION TABLE 1
(ROUNDED STONE)

STONE SIZE (mm)	PERCENT BY VOLUME
75	20
150	60
300	20

STONE THICKNESS/DEPTH OF 300mm

ACTIVE STONE VENEER (ASV) ON RIFFLES
TOP DRESS (30mm THICK) RIFFLE STONE WITH 4-29mm PEA GRAVEL (D50 OF 15mm)



CLIENT NAME: McCann Redi-Mix Inc. **McCANN REDIMIX** More Than Concrete

Greck
5770 Highway 7, Unit 3, Woodbridge, Ontario L4L 1T8

DATE	REVISION	BY
MAY 29, 2023	30% DESIGN ISSUED FOR REVIEW	B.G.
APRIL XX, 2024	ISSUED FOR APPROVALS	B.G.

SUBMISSION
DRAWING
NOT FOR CONSTRUCTION

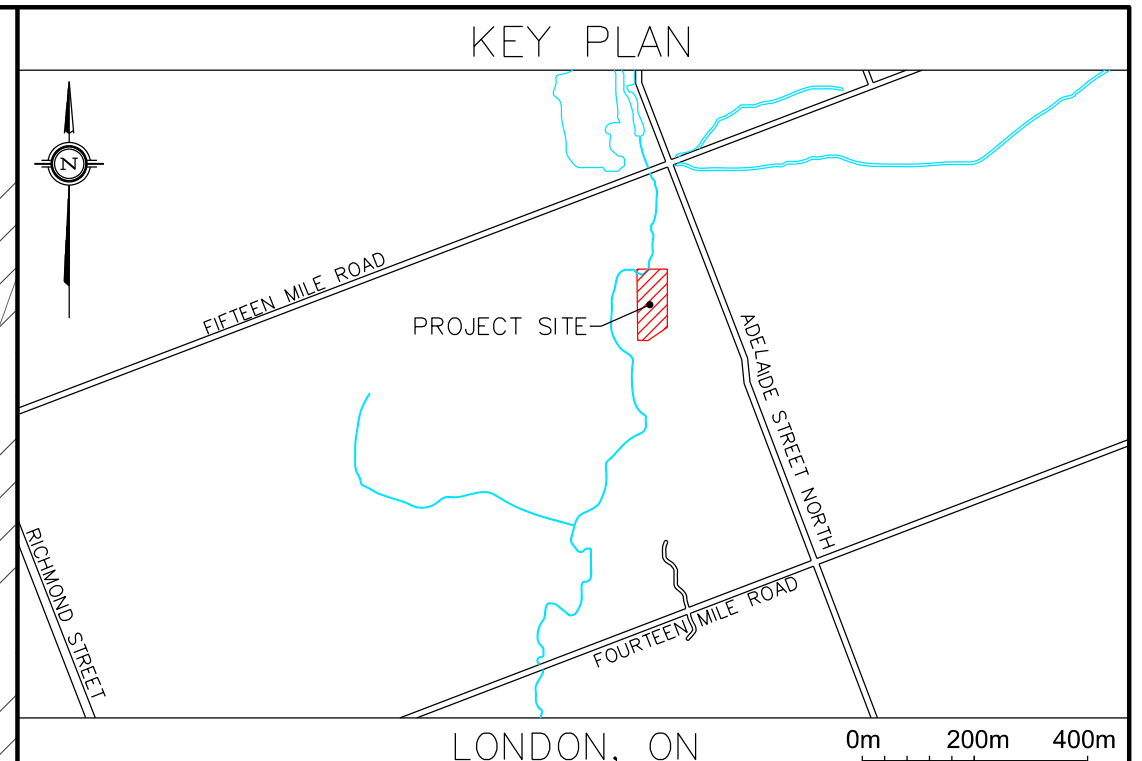
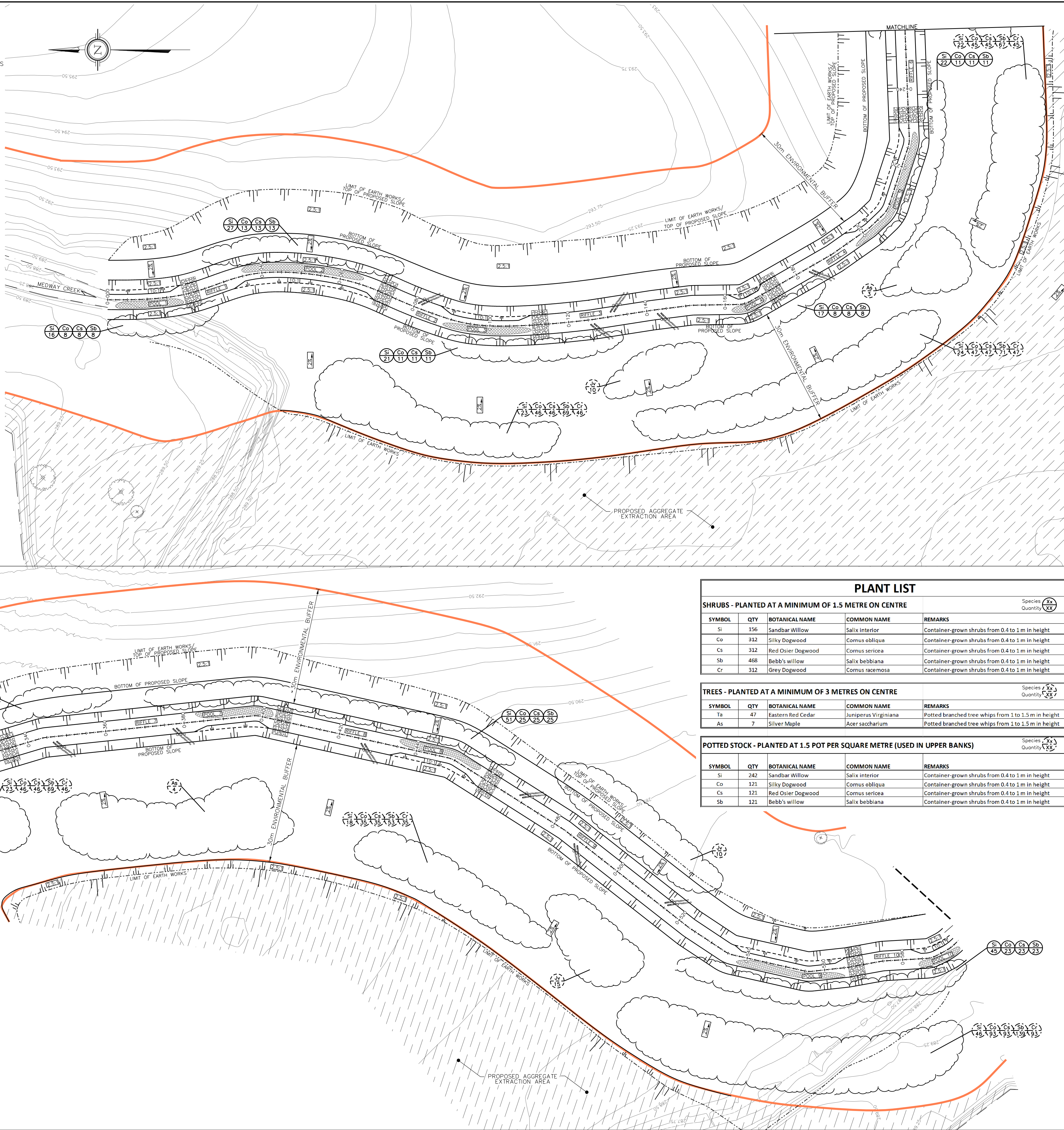
STANLEY PIT FLOOD STUDY & NATURAL CHANNEL DESIGN

EROSION AND SEDIMENT CONTROL NOTES AND DETAILS

DATE: APRIL 2024	DESIGN BY: B.G.	DWG. BY: P.G.	APPD. BY: B.G.
SCALE:	DRAWING NO. CD	PROJECT NO. 20-722	SHEET NO. 8

LANDSCAPING NOTES

- DO NOT STOCKPILE TOPSOIL CONSTRUCTION MATERIALS OR DEBRIS WITHIN THE DRIP LINE OF EXISTING TREES TO REMAIN ON SITE. CONTRACTOR TO PROTECT EXISTING TREES TO REMAIN. THE ENGINEER MAY DIRECT THE CONTRACTOR TO MARK AND FENCE PARTICULAR EXISTING TREES PRIOR TO STOCKPILING MATERIALS.
- IF SPECIFIED, ALL DORMANT MATERIAL SHALL BE INSTALLED IN THE SPRING (MARCH OR APRIL). IF INSTALLED OUTSIDE OF THIS WINDOW POTTED STOCK SHALL BE USED.
- TREE REMOVAL - NO TREES SHALL BE REMOVED WITHOUT PRIOR APPROVAL FROM THE PROJECT COORDINATOR. ALL TREE REMOVALS TO BE COMPLETED IN ACCORDANCE WITH ACCEPTED FORESTRY PRACTICES AND WITHOUT IMPACT TO EXISTING TREES/VEGETATION TO REMAIN ON SITE.
- ALL PLANT MATERIAL MUST BE GUARANTEED: PLANT MATERIAL THAT DOES NOT SURVIVE MUST BE REPLACED WITHIN ONE YEAR.
- ALL EXPOSED SOILS OR AREAS IMPACTED BY CONSTRUCTION ARE TO BE SCARIFIED AND DECOMPACTED HAVING A MINIMUM 300mm DEPTH OF TOPSOIL AND SEEDED WITH AN ONTARIO SEED COMPANY (OC) RURAL ONTARIO ROADSIDE NATIVE SEED MIXTURE 8145, SUPPLEMENT WITH 2% MILKWEED SPECIES AND A COVER CROP.
- COVER CROP TO INCLUDE OAT (AVENA SATIVA) 40%, (HORDEUM VULGARE BARLEY) 45%, (ELYMUS CANADENSIS) CANADA WILD RYE 15%, DRY SEEDS AT 15KG/HA.
- ALL SEEDED SURFACE WITH A GRADE >4:1 OR 25% ARE TO HAVE AN EROSION CONTROL BLANKET (TERRAFIX SC200B STRAW/COCONUT DOUBLE NET OR APPROVED EQUIVALENT) APPLIED.
- WITH THE EXCEPTION TO SPECIFIC TREE PLANTING LOCATIONS ALL SHRUB PLANTINGS OR CLUSTERS OF TREE PLANTINGS ARE TO BE IN A RANDOM PATTERN WITH THE SPACING SPECIFIED. PLANTS ARE NOT TO BE INSTALLED IN PERFECT ROWS.



NOTES

- ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
- CONTOUR INTERVAL IS 0.25m.
- TOPOGRAPHIC SURVEY INFORMATION:
COORDINATE SYSTEM: UTM Zone 17 N (GRID)
HORIZONTAL DATUM: NAD83 (CSRS - 2010)
VERTICAL DATUM: CGG2013
VERTICAL CONTROL: OBSERVED GPS ELEVATIONS
- ALL DIMENSIONS SHALL BE CHECKED AND VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO ANY CONSTRUCTION, AND ANY DISCREPANCIES SHALL BE REPORTED IMMEDIATELY TO THE PROJECT ENGINEER.
- ALL WORK SHALL BE IN ACCORDANCE WITH CURRENT CITY OF LONDON STANDARD SPECIFICATIONS AND DRAWINGS UNLESS OTHERWISE NOTED HEREIN.
- ORDER OF PRECEDENCE OF STANDARDS DRAWINGS IS FIRSTLY CITY OF LONDON AND SECONDLY ONTARIO PROVINCIAL STANDARDS (OPS).
- THE CONTRACTOR TO BE RESPONSIBLE FOR LOCATION OF ALL EXISTING U/G AND OVERHEAD UTILITIES. CONTRACTOR IS REQUIRED TO OBTAIN ALL LOCATIONS & NOTIFY THE VARIOUS UTILITY COMPANIES 72 HOURS PRIOR TO THE COMMENCEMENT OF ANY WORK. THE MUNICIPALITY OF MIDDLESEX CENTRE AND CONSULTANT ASSUMES NO RESPONSIBILITY FOR THE LOCATIONS OF EXISTING UTILITIES AS INDICATED ON THE DRAWING.

BENCHMARK

ELEVATIONS ARE BASED ON GPS OBSERVATIONS FROM PERMANENT REFERENCE STATIONS IN THE NAD83 (CSRS-2010) COORDINATE SYSTEM, WITH HEIGHTS CONVERTED TO ORTHOMETRIC ELEVATIONS ON THE CGVD28 DATUM (1978 ADJUSTMENT) WITH GEOID MODEL CGG2013, AS SUPPLIED BY NATURAL RESOURCES CANADA.

CONTROL POINT 1:
ELEV: 292.56m
NORTHING: 4777805.8940
EASTING: 474206.5790
LOCATION: CROSS IN CONCRETE BY BRIDGE ON FIFTEEN MILE ROAD

COMPLETED BY:
GRECK AND ASSOCIATES LIMITED
SURVEY COMPLETED ON THE 4th & 5th DAYS OF NOVEMBER, 2020.

LEGEND

- WATERLINE AT TIME OF SURVEY
- 292.00--- CONTOUR MAJOR - 0.25m INTERVAL
- 292.05--- CONTOUR MINOR - 0.25m INTERVAL
- (*) EXISTING DECIDUOUS TREE
- (*) EXISTING WOODY FEATURE
- - - - - LIMIT OF EARTH WORKS
- PROPOSED 30m ENVIRONMENTAL BUFFER
- (*) PROPOSED NATIVE PLANTINGS
- (*) PROPOSED RIFFLE
- (*) PROPOSED POOL
- (*) PROPOSED AGGREGATE EXTRACTION AREA

PLANT LIST

SHRUBS - PLANTED AT A MINIMUM OF 1.5 METRE ON CENTRE

SYMBOL	QTY	BOTANICAL NAME	COMMON NAME	REMARKS	Species Quantity
Si	156	Sandbar Willow	Salix interior	Container-grown shrubs from 0.4 to 1 m in height	156
Co	312	Silky Dogwood	Cornus obliqua	Container-grown shrubs from 0.4 to 1 m in height	312
Cs	312	Red Osier Dogwood	Cornus sericea	Container-grown shrubs from 0.4 to 1 m in height	312
Sb	468	Bebb's willow	Salix bebbiana	Container-grown shrubs from 0.4 to 1 m in height	468
Cr	312	Grey Dogwood	Cornus racemosa	Container-grown shrubs from 0.4 to 1 m in height	312

TREES - PLANTED AT A MINIMUM OF 3 METRES ON CENTRE

SYMBOL	QTY	BOTANICAL NAME	COMMON NAME	REMARKS	Species Quantity
Ta	47	Eastern Red Cedar	Juniperus virginiana	Potted branched tree whips from 1 to 1.5 m in height	47
As	7	Silver Maple	Acer saccharum	Potted branched tree whips from 1 to 1.5 m in height	7

POTTED STOCK - PLANTED AT 1.5 POT PER SQUARE METRE (USED IN UPPER BANKS)

SYMBOL	QTY	BOTANICAL NAME	COMMON NAME	REMARKS	Species Quantity
Si	242	Sandbar Willow	Salix interior	Container-grown shrubs from 0.4 to 1 m in height	242
Co	121	Silky Dogwood	Cornus obliqua	Container-grown shrubs from 0.4 to 1 m in height	121
Cs	121	Red Osier Dogwood	Cornus sericea	Container-grown shrubs from 0.4 to 1 m in height	121
Sb	121	Bebb's willow	Salix bebbiana	Container-grown shrubs from 0.4 to 1 m in height	121

CLIENT NAME:
McCann Redi-Mix Inc.

Greck
5770 Highway 7, Unit 3, Woodbridge, Ontario L4L 1T8

DATE	REVISION	BY
MAY 29, 2023	30% DESIGN ISSUED FOR REVIEW	B.G.
APRIL XX, 2024	ISSUED FOR APPROVALS	B.G.

SUBMISSION DRAWING
NOT FOR CONSTRUCTION

STANLEY PIT FLOOD STUDY & NATURAL CHANNEL DESIGN

GENERAL SITE GRADING PLAN

DATE: APRIL 2024	DESIGN BY: B.G.	DWG. BY: P.G.	APPD. BY: B.G.
SCALE: 1:500	DRAWING NO. RP	PROJECT NO. 20-722	SHEET NO. 9

DATE PLOTTED: 2024-04-24 PLOT SCALE: 1:60254 Z:\Projects\2020\20-722 - Stanley Pit Flood Study & Channel Design\05_Drawings\CAD\20-722-Stanley Pit_Base_2D.dwg

Appendix 10. DFO Letter of Advice



Fisheries and Oceans
Canada

Ontario and Prairie Region
Fish and Fish Habitat Protection Program
650 – 2010 12th Avenue
Regina, SK S4P 0M3

Pêches et Océans
Canada

Région de l'Ontario et des Prairies
Programme de protection du poisson et de son habitat
650 – 2010 12^e Avenue
Regina, SK S4P 0M3

Your file *Votre référence*

December 11, 2023

Our file *Notre référence*

23-HCAA-01456

McCann Redi Mix Inc.
69478 Bronson Line
Dashwood, Ontario, N0M 1N0

**Subject: Watercourse Realignment, Medway Creek, Middlesex County –
Implementation of Measures to Avoid and Mitigate the Potential for
Prohibited Effects to Fish and Fish Habitat**

Dear McCann Redi Mix Inc.:

The Fish and Fish Habitat Protection Program (the Program) of Fisheries and Oceans Canada (DFO) received your proposal on July 18, 2023. We understand that you propose to:

- Create a new ~580 m long channel (~2,900 m² footprint) that includes riffles, pools, woody debris, native substrates and riparian planting.
- Construct channel plugs and redirect flows into the new channel.
- Infill/put offline the existing ~ 575 m long channel (~ 2,875 m² footprint).

We understand the following aquatic species listed under the *Species at Risk Act* may use the area in the vicinity of where your proposal is to be located:

- Northern Sunfish listed as Special Concern

Our review considered the following information:

- Request for Review and additional supporting documents, dated July 18, 2023.
- Email correspondence between Brianna Wyn (DFO) and Tristan Knight (Terrastory Environmental Consulting Inc.) on September 18, 2023 and December 5, 2023.
- Email correspondence between Kasandra Goltz (DFO) and Tristan Knight (Terrastory Environmental Consulting Inc.) on October 30, 2023, November 21, 2023, November 23, 2023, December 5, 2023.

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

Canada

- 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 outcomes 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 and fish habitat.
 - Restricted Activity Period March 15 to July 15.
- Limit the duration of in-water works, undertakings and activities so as to not diminish the ability of fish to carry out one or more of their life processes (e.g., spawning, rearing, feeding, migrating).
- Screen intake pipes to prevent entrainment or impingement of fish.
 - Follow the [Interim code of practice: End of pipe fish protection screens for small water intakes in freshwater](#), when using pumps.
- Capture and relocate any fish trapped within an isolated/enclosed work area and safely relocate them to an appropriate location in the same waterbody.
 - Dewater gradually to reduce the potential for stranding fish.
 - Relocate any fish as per applicable permits for capturing and relocating fish.
- Use temporary cofferdams and diversion channels to isolate a section of a watercourse or water body in order to conduct works, undertakings and activities in the dry while maintaining the natural downstream flow.
 - Follow the [Interim standard: in-water site isolation](#), when using temporary cofferdams and diversion channels.
- Maintain fish passage during all phases of works, undertakings and activities.
 - Avoid changing flow or water levels.
 - Avoid obstructing and interfering with the movement and migration of fish.
 - Maintain an appropriate depth and flow (i.e., base flow and seasonal flow of water).
 - Conduct works, undertakings and activities during periods of low flow.
- Maintain an appropriate depth and flow (i.e., base flow and seasonal flow of water) for the protection of fish and fish habitat.
- Salvage, reinstate or match habitat structure (e.g., large wood debris, boulders, instream aquatic vegetation/substrate) to its natural state.
- Install effective erosion and sediment control measures prior to beginning works, undertakings and activities.
 - Schedule work to avoid wet, windy and rainy periods and heed weather advisories.

- Use only clean materials (e.g., rock, coarse gravel, wood, steel, snow) for works, undertakings and activities.
- Use appropriate isolation materials and designs to minimize disturbance to the bed and banks of the watercourse or water body.
- Conduct all in-water works, undertakings and activities in isolation of open or flowing water to reduce the introduction of sediment into the watercourse.
- Dispose of and stabilize all excavated material above the ordinary high water mark or top of bank of nearby water bodies and ensure sediment re-entry to the watercourse is prevented.
- Regularly inspect and maintain the sediment control measures and structures during all phases of the project.
- Regularly monitor the watercourse for signs of sedimentation during all phases of the works, undertakings and activities and take corrective action when needed.
- Keep the erosion and sediment control measures in place until all disturbed ground has been permanently stabilized.
- Remove all sediment control materials once site has been stabilized.
- Develop and immediately implement a response plan to prevent deleterious substances from entering a water body.

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*, the *Species at Risk Act* and the *Aquatic Invasive Species Regulations*.

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>.

Please notify this office at least 10 days before starting any in-water works. Send your notification to the assessor (contact information below) and the DFO 10 notification mailbox: DFO.OP.10DayNotification-Notification10Jours.OP.MPO@dfo-mpo.gc.ca. We recommend that a copy of this letter be kept on site while the work is in progress. It remains your responsibility to meet all other federal, territorial, provincial and municipal requirements that apply to your proposal.

Please note that the advice provided in this letter will remain valid for a period of 1 year from the date of issuance. If you plan to execute your proposal after the expiry of this

letter, we recommend that you contact the Program to ensure that the advice remains up-to-date and accurate. Furthermore, the validity of the advice is also subject to there being no change in the relevant aquatic environment, including any legal protection orders or designations, during the 1 year period.

If you have any questions with the content of this letter, please contact Kasandra Goltz by telephone at 587-385-9444 or by email at Kasandra.goltz@dfo-mpo.gc.ca. Please refer to the file number referenced above when corresponding with the Program.

Yours sincerely,

A handwritten signature in cursive script that reads "Amanda Conway".

Amanda Conway
A/Senior Biologist, Linear Development
Fish and Fish Habitat Protection Program

cc:

Tristan Knight (Terrastory Environmental Consulting Inc.)