



McKINLEY
ENVIRONMENTAL
SOLUTIONS

2750 & 2760 Sheffield Road Development Headwaters Drainage Feature Assessment



July 2023

Prepared for Richcraft Properties Ltd.

McKINLEY ENVIRONMENTAL SOLUTIONS

613-620-2255 | mckinleyenvironmental@gmail.com

www.mckinleyenvironmental.com

1.0	INTRODUCTION	1
1.1	Background & Site Overview	1
1.2	Description of Development	3
1.3	Purpose of the Headwaters Drainage Feature Assessment.....	3
2.0	METHODOLOGY	5
3.0	EXISTING CONDITIONS	7
3.1	Drainage Channel Overview	7
3.2	Hydrological Characteristics.....	8
3.3	Channel Morphology & Riparian Characteristics.....	10
3.4	Amphibian Habitat.....	13
3.5	Fish Habitat	13
3.6	Summary of Habitat Quality	15
4.0	CLASSIFICATION & MITIGATION.....	16
4.1	Classification Criteria.....	16
4.2	Drainage Channel Decommissioning & Impact Mitigation	17
4.3	Construction Stage Mitigation	18
5.0	SUMMARY	19
6.0	CLOSURE	20
7.0	REFERENCES	21

LIST OF FIGURES

Figure 1: Site Overview

Sheffield Industrial Building - Site Plan

Figure 2: HDFA Survey Sites

LIST OF TABLES

Table A: Hydrological Measurements

Table B: Channel Measurements

Table C: Riparian Classification

Table D: Amphibian Survey Results

Appendix A – Site Photographs

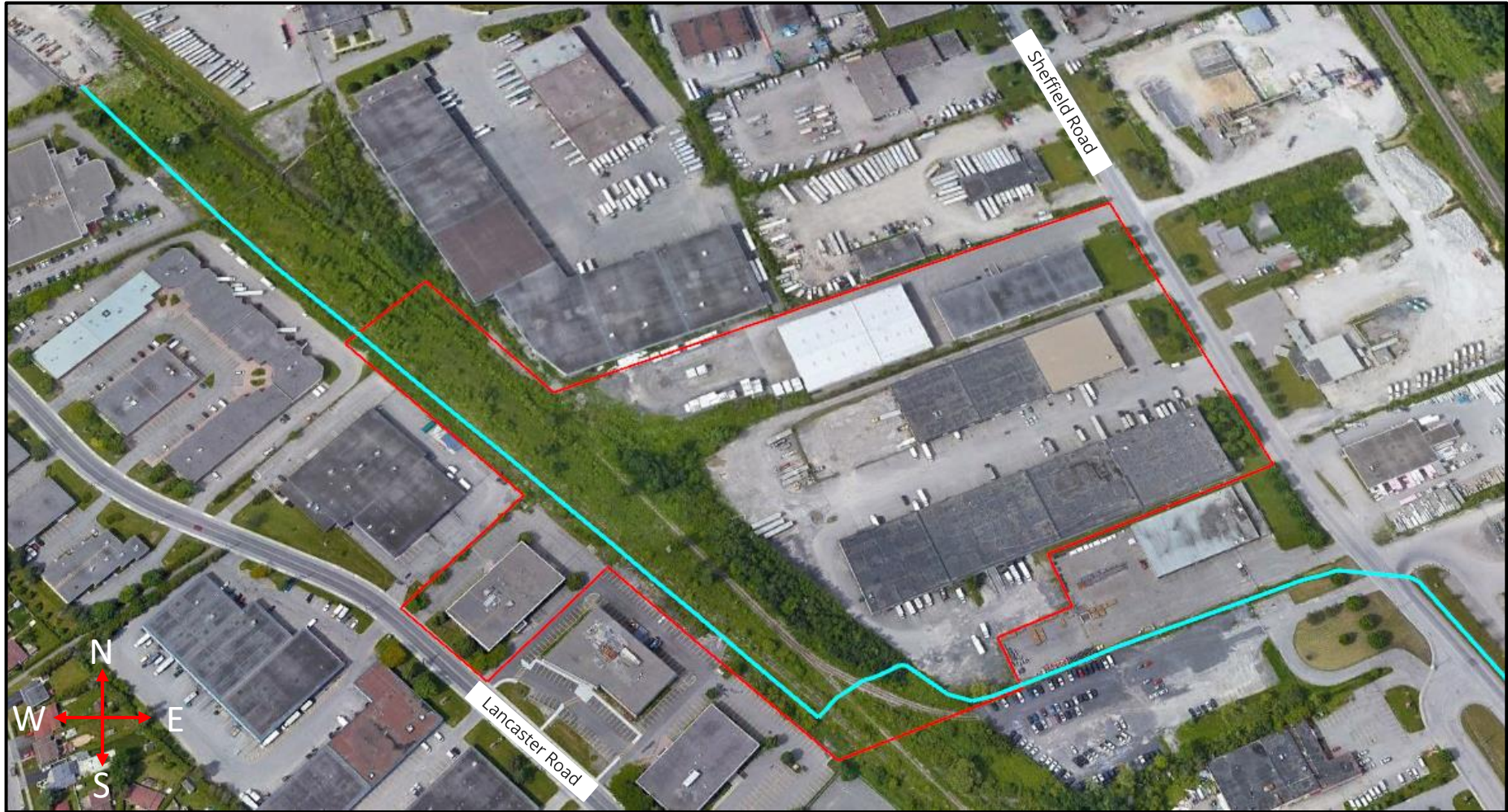
1.0 INTRODUCTION


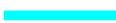
1.1 Background & Site Overview

The Site includes several connected parcels located at the municipal addresses 2750, 2760, 2713, and 2865 Sheffield Road, Ottawa (Ontario) (Lot 23 and Lot 24, Concession 3, Ottawa River (Gloucester)) (Refer to Figure 1). The Site is within the urban area of the City of Ottawa and is approximately 8.5 hectares in size. The eastern part of the Site includes four (4) existing industrial buildings with frontage on Sheffield Road. The western part of the Site includes one existing industrial building with frontage on Lancaster Road. Each of the existing industrial buildings is surrounded by paved parking/storage areas and landscaping features. The central part of the Site includes an undeveloped parcel that was historically part of a railway corridor. The former railway corridor is currently vacant and is occupied by regrowth vegetation. The Site is surrounded by existing industrial buildings, paved surfaces, and roads on all sides, with the exception of the adjacent undeveloped portions of the former railway corridor. A Drainage Channel traverses the former railway corridor in an approximately northwest to southeast direction. The Drainage Channel enters the Site at its northwest corner. The Drainage Channel exits the Site at its southeast corner before turning east towards Sheffield Road. The Drainage Channel is a minor tributary of Ramsay Creek.

FIGURE 1: SITE OVERVIEW

2750 & 2760 Sheffield Road, Ottawa, Ontario
Headwaters Drainage Feature Assessment (H DFA)



 - Site Limits  - Drainage Channel

Please Note: This is not a legal land survey. All dimensions and locations are shown as approximate.

1.2 Description of Development

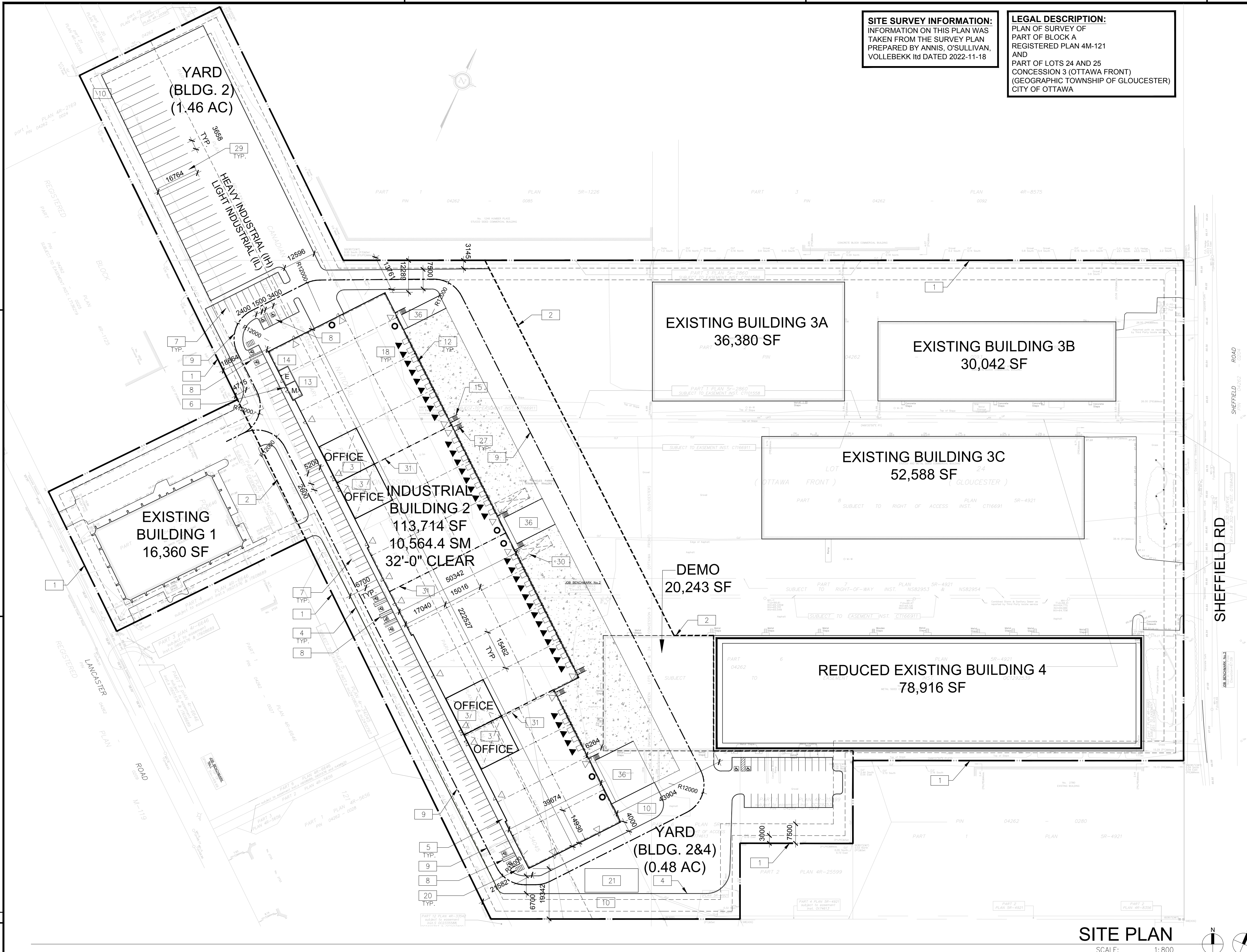
The eastern part of the Site includes four (4) existing industrial buildings with frontage on Sheffield Road. The western part of the Site includes one existing industrial building with frontage on Lancaster Road. Each of the existing industrial buildings is surrounded by paved parking/storage areas and landscaping features. As shown below in the Site Plan, the proposed development will involve the construction a new industrial building and associated paved parking/storage areas within the former railway corridor. The new industrial building will be divided into four (4) units, each of which will include an office space. The four (4) existing industrial buildings in the eastern part of the Site and the one existing industrial building within the western part of the Site will be retained, however, Existing Building #4 will be reduced in size in order to accommodate the construction of the new industrial building. Sheffield Road will be used for truck and shipping access to the new and existing industrial buildings. Lancaster Road will be used for small vehicle access.

1.3 Purpose of the Headwaters Drainage Feature Assessment

This Headwaters Drainage Feature Assessment (HDFA) has been prepared to evaluate the Drainage Channel which traverses the former railway corridor in an approximately northwest to southeast direction (Refer to Figure 1). The Drainage Channel enters the Site at its northwest corner. The Drainage Channel exits the Site at its southeast corner before turning east towards Sheffield Road. The Drainage Channel is a minor tributary of Ramsay Creek. As shown in the Site Plan, the proposed development will result in the decommissioning of the portion of the Drainage Channel that occurs within the Site. This HDFA has been prepared to evaluate and classify the Drainage Channel, while also providing management recommendations which are consistent with the Toronto and Region Conservation Authority (TRCA) (2014) *Evaluation, Classification and Management of Headwater Drainage Features Guideline*. The proposed decommissioning of the Drainage Channel will require approval by the City of Ottawa under the policies of the Official Plan and by the Rideau Valley Conservation Authority (RVCA) under O. Reg. 174/06.

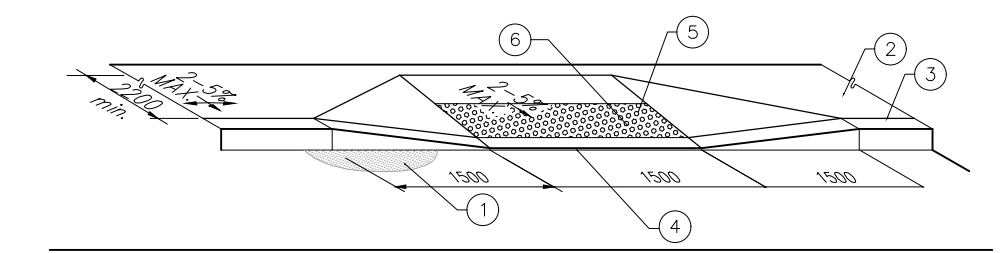
SITE SURVEY INFORMATION:
 INFORMATION ON THIS PLAN WAS
 TAKEN FROM THE SURVEY PLAN
 PREPARED BY ANNIS, O'SULLIVAN,
 VOLLEBEKK Ltd DATED 2022-11-18

LEGAL DESCRIPTION:
 PLAN OF SURVEY OF
 PART OF BLOCK A
 REGISTERED PLAN 4M-121
 AND
 PART OF LOTS 24 AND 25
 CONCESSION 3 (OTTAWA FRONT)
 (GEOGRAPHIC TOWNSHIP OF GLOUCESTER)
 CITY OF OTTAWA



SITE PLAN
 SCALE: 1:800
 CONSTRUCTION NORTH TRUE NORTH

OTW21-0002-00		
SITE STATISTICS		
ZONING	IH/IL	
GROSS SITE AREA	84,452 SM	
PROJECT LIMIT AREA	37,191 SM	
Zone Permitted Use (OTTAWA ZONING BY-LAW NO. 2008-250)		
Proposed Use	Warehouse	
Regulations (Part 11: Industrial Zones)		
	Proposed	Required IH (IL)
Min. Front Yard Building Setback (m)	18.66 m	7.5 m
Min. Interior Side Yard Building Set back (m)	12.29 m	7.5 m
Min.Rear Yard Building Setback (m)	N/A	7.5 m
Min.Landscape Front Yard Setback (m)	4.72 m	3 m
Min.Landscape Side Yard Setback (m)	3.15 m	3 m
Min.Landscape Rear Yard Setback (m)	N/A	3 m
Max. Floor Space Index	0.12	2
Max. Building Height	12 m	22 m (18m)
BUILDING FLOOR AREA		
Building 2	Warehouse Area 9,684.40m ²	
	Office Area 880.00m ²	
	TOTAL BUILDING GFA 10,564.40m²	
PARKING REQUIREMENT		
	PROPOSED	REQUIRED
Warehouse GFA @ 0.8 Spaces per 100m ² , first 5000m ²	126	63
Warehouse GFA @ 0.4 Spaces per 100m ² , above 5000m ²		
Total No. of Parking Spaces	126	63
Barrier Free Parking Spaces	12	5
Parking Stall Dimensions	2.6 m X 5.2 m	
Barrier Free Parking Stall Type A	3.4m X 5.2m	
Barrier Free Parking Stall Type B	2.4m X 5.2m	
Bicycle Parking Space Dimensions	1.8m X 0.6m	
No. Of Bicycle Parking (Warehouse: 1 per 2000m ² , Office 1 per 250m ²)	10	9
Loading Space Dimensions	3.5m X 9.0m	
Oversized Loading Space Dimensions	4.3m X 13.0m	
No. Of Loading Spaces	35	2
No. Of Oversized Loading Spaces	2	2
Trailer Parking	26	N/A
DOCK STATISTICS		
	Proposed	
DOCK-HIGH DOORS	35	
OVER-HEAD DOORS	6	



- PAVEMENT
- ACCESSIBLE ROUTE OF PEDESTRIAN TRAVEL 2200mm MIN. (UNLESS OTHERWISE NOTED ON PLANS)
- TOP FACE OF CURB
- DEPRESSED CURB
- TRUNCATED DOMES WITH A HEIGHT OF 4.5-5.5mm, BASE DIAMETER OF 21-25mm. REGULAR SPACING PATTERN AT 55-60mm ON CENTRE
- A MINIMUM 600mm WIDE SECTION DETECTABLE WARNING SURFACE SHALL BE PROVIDED WHEN FLAT TRAVEL SURFACE ADJACENT TO A VEHICULAR WAY (0mm CURB FACE)

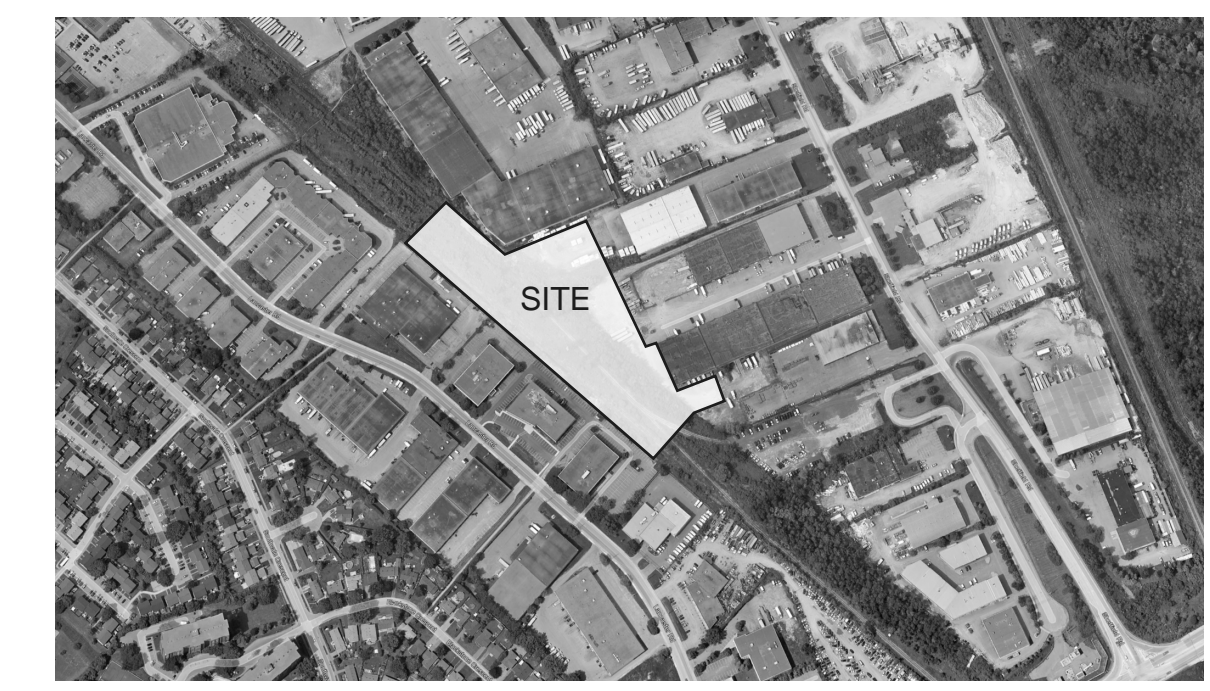
ACCESSIBLE CURB RAMP
 SCALE: N.T.S

SITE PLAN NOTES

- | | | |
|---|--|---|
| 1 PROPERTY LINE | 14 PROPOSED LOCATION OF ELECTRICAL RM | 31 FUTURE TENANT DEMISING WALL. SUBJECT TO TENANT FIT UP |
| 2 PROJECT LIMIT LINE | 15 GALVANIZED STEEL GUARDRAIL WITH HANDRAIL | 32 CONCRETE APRON |
| 3 PRINCIPLE ENTRY - TENANT FIT-UP SUBJECT TO INTERIOR ALTERATION PERMIT | 16 EMPLOYMENT AMENITY SPACE - REFER TO LANDSCAPE DRAWINGS | 33 PAINTED LINES PEDESTRIAN CROSSING |
| 4 150mm WIDE CURB TYPICAL | 17 SHADED AREA DENOTES HEAVY DUTY ASPHALT. TYPICAL FOR ALL AREAS REQUIRING FIRE OR TRACTOR TRUCK ACCESS. | 34 PYLON SIGNAGE |
| 5 SIDEWALK - SEE LANDSCAPE DWGS FOR CONSTRUCTION DETAILS | 18 TRUCK LOADING DOCK (TYP.) | 35 DIMENSION FROM FIRE DEPARTMENT CONNECTION TO HYDRANT. |
| 6 FIRE DEPARTMENT/SIAMESE CONNECTION | 19 STEEL BOLLARD | 36 DRIVE-IN RAMP BOUNDED BY RETAINING WALLS WITH GUARDRAILS WHERE GRADE CHANGE IS MORE THAN 600mm - REFER TO CIVIL DWGS |
| 7 2600x5200mm PARKING STALL, PAINTED PARKING STRIPING PER CITY OF OTTAWA ZONING BY-LAW NO. 2008-250 | 20 GALV. BICYCLE RACKS - SEE LANDSCAPE DRAWINGS | |
| 8 TYPICAL ACCESSIBLE PARKING STALLS, PAINTED PARKING STRIPING PER BY-LAW OTTAWA ZONING BY-LAW NO. 2008-250. EACH PAIR OF SHARED STALLS TO HAVE TYPE A: 3.4m X 5.2m AND TYPE B: 2.4m X 5.2m WITH 1.5m WIDE PAINTED BARRIER FREE AISLE AND SIGNAGE REFER TO ONTARIO INTEGRATED ACCESSIBILITY STANDARDS. | 21 SNOW STORAGE AREA | |
| 9 FIRE ACCESS ROUTE W/ 12.0M TURNING RADIUS (---) | 22 EXISTING FIRE HYDRANT | |
| 10 LANDSCAPE AREA - SEE LANDSCAPE DRAWINGS | 23 PROPOSED LIGHT POLE. REFER TO ELECTRICAL DRAWINGS | |
| 11 GUARDRAIL SET INTO RETAINING WALL. REFER TO CIVIL DRAWINGS FOR EXTENT AND DETAILS. | 24 FIRE ROUTE SIGNAGE PER CITY OF OTTAWA STANDARDS. REFER TO FIRE ROUTE BY-LAW NO. 2003-499 FOR SIGN REQUIREMENTS. SIGNS TO BE SPACED NO MORE THAN 25m APART | |
| 12 12.0mX3.5m TRUCK LOADING SPACE (TYP.) | 25 TACTILE WALKING SURFACE INDICATOR STRIP | |
| 13 PROPOSED LOCATION OF MECHANICAL RM | 26 IN GROUND EARTH-BIN GARBAGE RECEPTACLES WITH VEGETATION SCRE | |
| | 27 EXTERIOR GALV. STEEL STAIRS W/ TUBE STEEL GUARDRAIL, ON CONC. PAD, TYP. | |
| | 28 EV PARKING STALLS (X PROPOSED; X FUTURE) | |
| | 29 TRUCK TRAILER PARKING | |
| | 30 13mX4.3m OVERSIZED TRUCK LOADING SPACE | |

SITE LEGEND

- NEW HEAVY DUTY PAVEMENT (HATCHED)
- NEW LANDSCAPED AREA (HATCHED)
- NEW RIVER STONE AREA (HATCHED)
- PAINTED DIAGONAL LINES WHERE INDICATED
- FUTURE EV PARKING STALLS
- PROPERTY LINE
- SITE BOUNDARY LINE
- GAS METER LOCATION.
- FIRE DEPT CONNECTION (VERIFY LOCATION WITH CIVIL DRAWINGS)
- PROPOSED FIRE HYDRANT
- EXISTING FIRE HYDRANT (VERIFY LOCATION WITH CIVIL DRAWINGS)
- PROPOSED FIRE HYDRANT
- LIGHT POLE
- WALL MOUNTED LIGHT
- MH DENOTES MANHOLE
- PROPOSED CATCHBASIN
- TACTILE INDICATORS AT DEPRESSED CURB
- BICYCLE RACK (1800 x 600 PER BIKE)
- MAN DOOR
- DOCK HIGH TRUCK DOOR
- GRADE LEVEL TRUCK DOOR
- FIRE ROUTE SIGNS
- PLYON SIGNAGE
- CONCRETE SIDEWALK
- ASPHALT PATHWAY
- STONE DUST PATHWAY



KEY PLAN
 SCALE: N.T.S

WARE MALCOMB
 1420 Blair Towers Place, Suite #104
 Gloucester, Ontario, Canada K1J 9L8
 P 343.633.2977

ARCHITECTURE
 PLANNING
 INTERIORS

CIVIL ENGINEERING
 BRANDING
 BUILDING MEASUREMENT

ONTARIO ASSOCIATION
 OF
ARCHITECTS
 JOHN P. HOLLAND
 LICENCE
 8649

RICHCRAFT

SHEFFIELD INDUSTRIAL BUILDING
 2760-2770 SHEFFIELD RD.
 OTTAWA
 ON K1B 3V9, CANADA.

SITE PLAN

DATE	ISSUED FOR SPA	REMARKS
2023-05-17		

PA/PM:	J. HOLLAND
DRAWN BY.:	
JOB NO.:	OTW21-0002-00

SHEET
A100

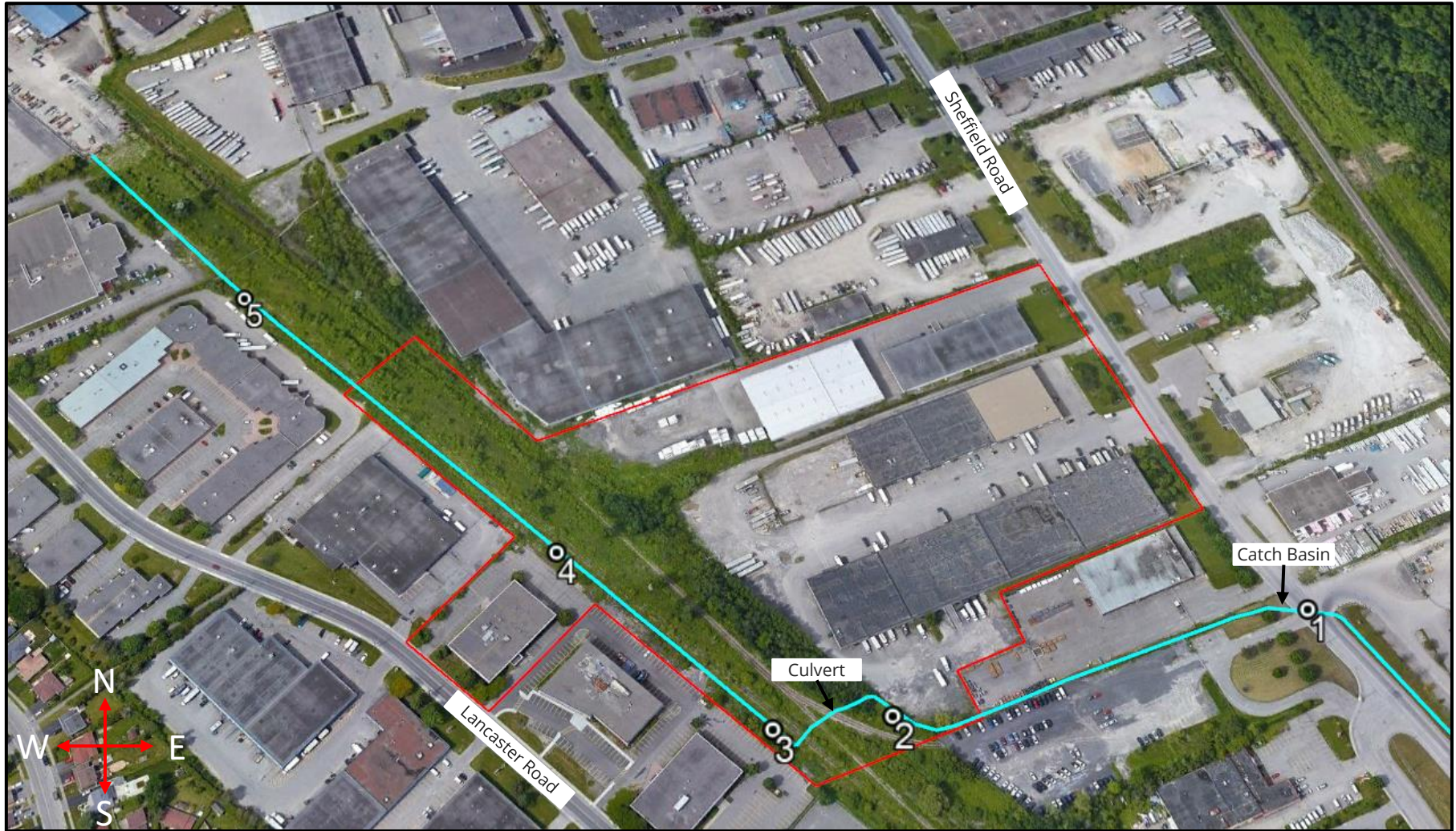
2.0 METHODOLOGY




The field component of the Headwaters Drainage Feature Assessment (H DFA) was undertaken following the *Evaluation, Classification and Management of Headwater Drainage Features Guideline* (TRCA 2014). The H DFA Survey Sites are shown below in Figure 2. As shown in Figure 2, five (5) H DFA Survey Sites were required. Upstream and downstream drainage feature segments were measured at each of the five (5) H DFA Survey Sites. Each of the H DFA Survey Sites included 40 m upstream and 40 m downstream of each constriction, confluence, and/or each location with divergent ecological conditions. The field surveys included the following:

- **Ontario Stream Assessment Protocol (OSAP) Module S4.M10 – Assessing Headwaters Drainage Features (Stanfield et al. 2013):** OSAP Module S4.M10 includes an assessment of hydrological and physical functions. The parameters measured are summarized in Table A, Table B and Table C. The parameters measured included the watercourse type, flow regime, wetted width, water depth, hydraulic head, bankfull width, channel depth, substrate and riparian corridor vegetation. The flow and water measurements were completed on April 12th (spring freshet), May 24th (late spring), and July 2nd, 2023 (mid-summer). The channel measurements were completed during the April 12th, 2023 Site visit.
- **Marsh Monitoring Program – Amphibian Call Count Surveys (Bird Studies Canada 2003):** The potential presence of amphibian breeding habitat was evaluated according to the *Marsh Monitoring Program – Amphibian Call Count Surveys Method* (Bird Studies Canada 2003). This method requires the completion of three (3) night time surveys in April, May and June, during which the potential presence of amphibian breeding habitat was assessed by listening for frog calls. The surveys were completed on April 21st, May 15th, and June 15th, 2023. The weather conditions on April 21st included overcast skies and temperatures of 13 °C. The weather conditions on May 15th included temperatures of 21 °C and clear skies. The weather conditions on June 15th included partly cloudy skies and temperatures of 21 °C. The amphibian call count surveys were conducted in the upstream and downstream segments of each of the H DFA Survey Sites. The amphibian survey results are summarized in Table D.
- **Fish Habitat Assessment:** The potential presence of fish habitat was assessed as part of the H DFA. As described below in Section 3.1 and Section 3.2, the Drainage Channel is not directly connected to any upstream or downstream natural watercourses. The Drainage Channel is also a predominantly stagnant feature with limited hydrological functions. These characteristics are such that the Drainage Channel is unlikely to provide any significant fish habitat functions (Refer to Section 3.5 for additional details). The Drainage Channel was surveyed for the potential presence of fish through the use of a dip net on July 2th, 2023. No fish were observed within the Drainage Channel during the H DFA field surveying.

FIGURE 2: HDFA SURVEY SITES

2750 & 2760 Sheffield Road, Ottawa, Ontario
Headwaters Drainage Feature Assessment (HDFA)



 - Site Limits  - Drainage Channel  - Headwaters Drainage Feature Assessment (HDFA) Survey Sites

Please Note: This is not a legal land survey. All dimensions and locations are shown as approximate.

3.0 EXISTING CONDITIONS

3.1 Drainage Channel Overview

As shown above in Figure 2, the Drainage Channel originates northwest of the Site within the undeveloped portion of the former railway corridor. The Drainage Channel does not extend further upstream beyond the undeveloped portion of the former railway corridor, meaning that any upstream channel that may have existed historically has been decommissioned (e.g. the Drainage Channel does not connect to any upstream surface water features). The Drainage Channel traverses the former railway corridor in an approximately northwest to southeast direction. The Drainage Channel enters the Site at its northwest corner. The Drainage Channel exits the Site at its southeast corner before turning east towards Sheffield Road. At Sheffield Road the Drainage Channel enters a catch basin and is conveyed underground through the stormwater sewer system. As such, the Drainage Channel does not directly connect to any downstream surface water features.

The Drainage Channel does not receive any flow from upstream areas and there are no drains and/or outlets that convey water to the Drainage Channel. The Drainage Channel is therefore fed entirely by surface runoff, especially snow melt. Several of the adjacent developed properties plow snow into the undeveloped areas of the former railway corridor. The accumulation of plowed snow during the winter appears to provide the primary hydrological input to the Drainage Channel. The Drainage Channel is a minor tributary of Ramsay Creek. Refer to Appendix A for photographs of the Drainage Channel.

3.2 Hydrological Characteristics

The hydrological characteristics of the Drainage Channel are summarized below in Table A. As described above in Section 3.1, the Drainage Channel does not receive any flow from upstream areas and there are no drains and/or outlets that convey water to the Drainage Channel. The Drainage Channel is therefore fed entirely by surface runoff, especially snow melt. Several of the adjacent developed properties plow snow into the undeveloped areas of the former railway corridor. The accumulation of plowed snow during the winter appears to provide the primary hydrological input to the Drainage Channel. Water from the melting snow piles hydrated Site #3, Site #4 and Site #5 in the early spring, with water depths between 113 mm and 430 mm during the spring freshet (April 12th). Site #1 and Site #2 displayed shallower water depths measuring between 30 mm and 223 mm during the spring freshet (April 12th). Even during the spring freshet, the majority of the Drainage Channel was stagnant, with no flow observed in Site #2, Site #3, Site #4 and Site #5. Minimal flow volumes were observed at the upstream segment of Site #1, where a small volume of water was seen to flow into the catch basin at Sheffield Road during the spring freshet (April 12th). Site #1 and Site #2 were entirely dry during the late spring (May 24th) and mid-summer (July 2nd). Standing water depths declined in Site #3, Site #4 and Site #5 throughout the survey season, with water depths ranging between 67 mm and 287 mm during the late spring (May 24th) and water depths ranging between 80 mm and 357 mm during the mid-summer (July 2nd). There was no flow observed within Site #3, Site #4 and Site #5 during the late spring and the mid-summer.

The survey results indicate that the Drainage Channel has very limited hydrological functions. The Drainage Channel does not receive water from any upstream watercourses and/or outlets, and it appears to be fed entirely by snowmelt and surface runoff. Even during the spring freshet, there is very little flow from the Drainage Channel to downstream areas, and each segment of the Drainage Channel was either dry or stagnant throughout the late spring and the mid-summer. The Drainage Channel has very limited hydrological functions and does not contribute significant water and/or nutrients to downstream areas.

TABLE A: HYDROLOGICAL MEASUREMENTS

SITE	SEGMENT	FEATURE TYPE	FLOW REGIME*			WETTED WIDTH (cm)			AVERAGE WATER DEPTH (mm)			AVERAGE HYDRAULIC HEAD (mm)		
			April 12	May 24	July 2	April 12	May 24	July 2	April 12	May 24	July 2	April 12	May 24	July 2
Site #1	Downstream	Roadside Ditch	No Flow	Dry	Dry	60	0	0	30	0	0	0	0	0
	Upstream	Drainage Channel	Minimal	Dry	Dry	49	0	0	47	0	0	5	0	0
Site #2	Downstream	Drainage Channel	No Flow	Dry	Dry	137	0	0	223	0	0	0	0	0
	Upstream	Drainage Channel	No Flow	Dry	Dry	135	0	0	63	0	0	0	0	0
Site #3	Downstream	Drainage Channel	No Flow	No Flow	No Flow	420	310	210	113	67	80	0	0	0
	Upstream	Drainage Channel	No Flow	No Flow	No Flow	350	280	340	280	257	320	0	0	0
Site #4	Downstream	Drainage Channel	No Flow	No Flow	No Flow	320	260	280	323	243	223	0	0	0
	Upstream	Drainage Channel	No Flow	No Flow	No Flow	370	290	300	397	233	357	0	0	0
Site #5	Downstream	Drainage Channel	No Flow	No Flow	No Flow	420	370	390	430	287	350	0	0	0
	Upstream	Drainage Channel	No Flow	No Flow	No Flow	240	190	220	407	240	323	0	0	0

*Flow Regime categories are defined as Substantial = Surface Flow >0.5 L/sec; Minimal = Surface Flow <0.5 L/Sec; No Flow = Stagnant Surface Water; Dry = No Surface Water

3.3 Channel Morphology & Riparian Characteristics

The channel morphology and riparian characteristics of the Drainage Channel are summarized below in Table B and Table C (respectively). The Drainage Channel is a channelized drain throughout the survey area. The bankfull width of the Drainage Channel varies between approximately 2.0 m and 6.1 m in most areas, although the channel is very broad and flat at the downstream segment of Site #3, where the bankfull width is 9.0 m. The average channel depth is approximately 545 mm. The Drainage Channel substrate includes silt and gravel within the downstream and upstream segments of Site #1 (respectively). Site #1 has minimal and moderate feature roughness (downstream and upstream, respectively). The remainder of the Drainage Channel has extreme feature roughness and is dominated by woody debris and/or dense vegetation including Common Cattails, deciduous shrubs, and grasses.

As summarized below in Table C, the riparian corridor surrounding the Drainage Channel is highly degraded. The riparian corridor is dominated by the disturbed ground conditions of the former railway corridor (e.g. rocky former railway beds), paved surfaces, and lawns. There are several areas where Trees and/or Tree Stands surround the Drainage Channel, however, woody vegetation accounts for a comparatively small proportion of the riparian corridor. The riparian corridor is dominated by poor quality and highly disturbed habitat conditions.

TABLE B: CHANNEL MEASUREMENTS

SITE	SEGMENT	FEATURE TYPE	BANKFULL WIDTH (m)	CHANNEL DEPTH (mm)	SUBSTRATE	FEATURE ROUGHNESS**	CONSTRICTIONS AND INPUTS
Site #1	Downstream	Roadside Ditch	3.2	190	Silt	Minimal	Site #1 downstream segment is a roadside ditch that does not connect to Site #1 upstream segment.
	Upstream	Drainage Channel	3.7	830	Gravel	Moderate	Site #1 upstream segment drains into a catch basin.
Site #2	Downstream	Drainage Channel	2.0	400	Woody Debris	Extreme	The Drainage Channel passes through a culvert beneath the old railway bed between Site #2 and Site #3.
	Upstream	Drainage Channel	2.0	150	Woody Debris	Extreme	
Site #3	Downstream	Drainage Channel	9.0	400	Common Cattails	Extreme	
	Upstream	Drainage Channel	5.9	730	Common Cattails/Shrubs	Extreme	
Site #4	Downstream	Drainage Channel	4.9	480	Common Cattails	Extreme	
	Upstream	Drainage Channel	4.5	730	Common Cattails	Extreme	
Site #5	Downstream	Drainage Channel	6.1	830	Grasses	Extreme	
	Upstream	Drainage Channel	3.9	710	Woody Debris	Extreme	

**Feature Roughness categories are defined by OSAP Module 4.10 as; Minimal = Less than 10% of the areal coverage of the channel contains materials that diffuse flows; Moderate = 10-40% of the areal coverage of the channel contains materials that diffuse flows; High = 40-60% of the areal coverage of the channel contains materials that diffuse flows; Extreme = More than 60% of the areal coverage of the channel contains materials that diffuse flows.

TABLE C: RIPARIAN CLASSIFICATION

SITE	SEGMENT	FEATURE TYPE	LEFT BANK*			RIGHT BANK*		
			0 - 1.5 m	1.5 - 10 m	10 - 30 m	0 - 1.5 m	1.5 - 10 m	10 - 30 m
Site #1	Downstream	Roadside Ditch	Lawn	Paved Surface	Lawn	Lawn	Lawn	Paved Surface
	Upstream	Drainage Channel	Lawn	Paved Surface	Lawn	Lawn	Paved Surface	Lawn
Site #2	Downstream	Drainage Channel	Tree Stand	Paved Surface	Paved Surface	Tree Stand	Paved Surface	Paved Surface
	Upstream	Drainage Channel	Tree Stand	Tree Stand	Former Railway Corridor	Tree Stand	Tree Stand	Paved Surface
Site #3	Downstream	Drainage Channel	Former Railway Corridor	Former Railway Corridor	Former Railway Corridor	Former Railway Corridor	Former Railway Corridor	Former Railway Corridor
	Upstream	Drainage Channel	Former Railway Corridor	Paved Surface	Paved Surface	Former Railway Corridor	Former Railway Corridor	Former Railway Corridor
Site #4	Downstream	Drainage Channel	Lawn	Paved Surface	Paved Surface	Former Railway Corridor	Former Railway Corridor	Former Railway Corridor
	Upstream	Drainage Channel	Lawn	Paved Surface	Paved Surface	Former Railway Corridor	Former Railway Corridor	Former Railway Corridor
Site #5	Downstream	Drainage Channel	Lawn	Paved Surface	Paved Surface	Former Railway Corridor	Former Railway Corridor	Former Railway Corridor
	Upstream	Drainage Channel	Tree Stand	Paved Surface	Paved Surface	Former Railway Corridor	Former Railway Corridor	Former Railway Corridor

*Left and right bank are relative to an observer facing upstream.

3.4 Amphibian Habitat

Table D summarizes the results of the amphibian call count surveys. No frogs were observed calling within the Site during the survey period. There were also no frogs heard calling in the immediately surrounding area adjacent to the Site. The survey results indicate that the Drainage Channel does not provide amphibian breeding habitat functions.

3.5 Fish Habitat

As described above in Section 3.1 and Section 3.2, the Drainage Channel is not directly connected to any upstream or downstream natural watercourses. The Drainage Channel is also a predominantly stagnant feature with limited hydrological functions. These characteristics are such that the Drainage Channel is unlikely to provide any significant fish habitat functions. The Drainage Channel was surveyed for the potential presence of fish through the use of a dip net on July 2th, 2023. No fish were captured during the fish survey. No fish were observed within the Drainage Channel during the Headwaters Drainage Feature Assessment (HDFA) field surveying, and therefore the Drainage Channel does not provide any significant fish habitat functions.

TABLE D: AMPHIBIAN SURVEY RESULTS

SITE	SEGMENT	FEATURE TYPE	AMPHIBIAN CALL ACTIVITY		
			April 21	May 15	June 15
Site #1	Downstream	Roadside Ditch	None	None	None
	Upstream	Drainage Channel	None	None	None
Site #2	Downstream	Drainage Channel	None	None	None
	Upstream	Drainage Channel	None	None	Killdeer
Site #3	Downstream	Drainage Channel	None	None	Killdeer
	Upstream	Drainage Channel	None	None	Killdeer
Site #4	Downstream	Drainage Channel	None	None	None
	Upstream	Drainage Channel	Killdeer	None	None
Site #5	Downstream	Drainage Channel	None	None	None
	Upstream	Drainage Channel	None	None	None

3.6 Summary of Habitat Quality

The Headwaters Drainage Feature Assessment (HDFA) survey results indicate that the Drainage Channel has very limited hydrological functions. The Drainage Channel does not receive water from any upstream watercourses and/or outlets, and it appears to be fed entirely by snowmelt and surface runoff. Even during the spring freshet, there is very little flow from the Drainage Channel to downstream areas, and each segment of the Drainage Channel was either dry or stagnant throughout the late spring and the mid-summer. The Drainage Channel has very limited hydrological functions and does not contribute significant water and/or nutrients to downstream areas.

The riparian corridor surrounding the Drainage Channel is highly degraded. The riparian corridor is dominated by the disturbed ground conditions of the former railway corridor (e.g. rocky former railway beds), paved surfaces, and lawns. There are several areas where trees and/or tree stands surround the Drainage Channel, however, woody vegetation accounts for a comparatively small proportion of the riparian corridor. The Drainage Channel does not provide any significant amphibian breeding habitat and/or fish habitat functions.

The HDFA survey results indicate that the Drainage Channel is a highly degraded and low quality habitat feature that does not provide any significant ecological functions.

4.0 CLASSIFICATION & MITIGATION

4.1 Classification Criteria

The Classification Criteria for Headwaters Drainage Feature Assessments are provided by the Toronto and Region Conservation Authority (TRCA) (2014). Refer to TRCA (2014) for further details regarding the Classification Criteria. The Classification Criteria for the Drainage Channel are as follows:

- **Hydrological Classification:** Contributing Functions - Ephemeral. TRCA definition: *Provides ephemeral flow or water storage functions during and (for a short time) after spring freshet and following large rain events only.*
- **Riparian Classification:** Limited Functions. TRCA definition: *The riparian corridor is dominated by cropped land or no vegetation.*
- **Fish and Fish Habitat Classification:** Contributing Functions. TRCA definition: *Transport of allochthonous materials to downstream fish bearing reaches provides sources of food.*
- **Terrestrial Habitat Classification:** Limited Functions. TRCA definition: *No terrestrial habitat (amphibian habitat) and/or movement corridors present.*
 - **Determination:** Mitigation. Following the TRCA (2014) guidelines, mitigation is required for drainage features with contributing hydrological functions, no important and/or valued fish habitat, no valued terrestrial habitat, and no important riparian vegetation.

4.2 Drainage Channel Decommissioning & Impact Mitigation

As shown above in the Site Plan, the proposed development will result in the decommissioning of the portion of the Drainage Channel that occurs within the Site. The proposed decommissioning of the Drainage Channel will require approval by the Rideau Valley Conservation Authority (RVCA) under O. Reg. 174/06. As described above, the Drainage Channel does not provide any significant amphibian breeding habitat and/or fish habitat functions, and therefore no amphibian breeding habitat and/or fish habitat compensation should be required.

The water that is currently stored and/or conveyed by the Drainage Channel will be captured by the new stormwater management system that will be constructed as part of the proposed development. The new stormwater management system will outlet to the existing stormwater sewers along Lancaster Road and Sheffield Road. Stormwater quantity control will be provided by rooftop and underground storage systems, which will control the post development flow rates. Stormwater quality control will be provided by an oil-grit separator system. The proposed stormwater management system and its associated stormwater quantity and quality controls are anticipated to be sufficient to mitigate potential downstream impacts (Ware Malcomb 2023).

4.3 Construction Stage Mitigation

A Sediment and Erosion Control Plan will be required to ensure that the downstream areas of the Drainage Channel and any adjacent stormwater/sewer systems are not negatively impacted by sediment and erosion during the development of the Site. The Sediment and Erosion Control Plan must address the sediment and erosion control requirements during the decommissioning of the Drainage Channel.

The concurrently prepared Combined Environmental Impact Statement (EIS) & Tree Conservation Report (TCR) provides a detailed description of the construction stage mitigation requirements for Species at Risk (SAR) and other wildlife, including mitigation requirements during tree clearing (MES 2023). For brevity, only those mitigation requirements which pertain directly to the decommissioning of the Drainage Channel are listed below. In addition to the mitigation requirements outlined in MES (2023), the following requirements apply when decommissioning the Drainage Channel:

- **Timing Window:** The decommissioning of the Drainage Channel should be undertaken outside of the sensitive in-water work timing window, which is from March 15th to June 30th each year.

5.0 SUMMARY

The Headwaters Drainage Feature Assessment (HDFA) survey results indicate that the Drainage Channel has very limited hydrological functions and does not contribute significant water and/or nutrients to downstream areas. The riparian corridor surrounding the Drainage Channel is highly degraded. The Drainage Channel can be characterized as a highly degraded and low quality habitat feature that does not provide any significant ecological functions.

The Drainage Channel will be decommissioned in order to accommodate the proposed development. The proposed decommissioning of the Drainage Channel will require approval by the Rideau Valley Conservation Authority (RVCA) under O. Reg. 174/06. As described above, the Drainage Channel does not provide any significant amphibian breeding habitat and/or fish habitat functions, and therefore no amphibian breeding habitat and/or fish habitat compensation should be required.

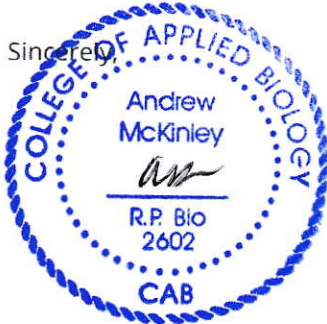
The water that is currently stored and/or conveyed by the Drainage Channel will be captured by the new stormwater management system that will be constructed as part of the proposed development. The new stormwater management system will outlet to the existing stormwater sewers along Lancaster Road and Sheffield Road. The new stormwater management system will include stormwater quantity and quality controls.

The decommissioning of the Drainage Channel is not anticipated to significantly negatively impact the natural features and functions of the Site, provided that the mitigation requirements described above are implemented appropriately.

6.0 CLOSURE

We trust that the above information is sufficient. Please do not hesitate to contact the undersigned if you have any questions or require further information.

Sincerely,



Dr. Andrew McKinley, EP, RP Bio.
Senior Biologist, McKinley Environmental Solutions



McKINLEY
ENVIRONMENTAL
SOLUTIONS

McKINLEY ENVIRONMENTAL SOLUTIONS

613-620-2255

mckinleyenvironmental@gmail.com

www.mckinleyenvironmental.com

7.0 REFERENCES

Bird Studies Canada (2003) Marsh Monitoring Program Training Kit and Instructions for Surveying Marsh Birds, Amphibians and their Habitats.

City of Ottawa (2023) Geo-Ottawa Municipal Mapping Site. Retrieved June 21st, 2023 at <<https://maps.ottawa.ca/geottawa/>>

McKinley Environmental Solutions (MES) (2023) 2750 & 2760 Sheffield Road Development - Combined Environmental Impact Statement & Tree Conservation Report.

Ontario Ministry of Natural Resources and Forestry (OMNRF) (2010) OMNRF Natural Heritage Reference Manual for Natural Heritage Policies of the Provincial Policy Statement, 2005, Second Edition.

Stanfield, L., Giudice, L.D., Bearss, E., and D. Morodvanschi (2013) Ontario Stream Assessment Protocol (OSAP) Section 4: Module 10 – Assessing Headwater Drainage Features.

Toronto and Region Conservation Authority (TRCA) (2014) Evaluation, Classification and Management of Headwater Drainage Features Guideline.

Ware Malcomb (2023) Functional Servicing and Stormwater Management Report. Proposed Industrial Building (2760 – 2770 Sheffield Road).

APPENDIX A – SITE PHOTOGRAPHS



McKINLEY
ENVIRONMENTAL
SOLUTIONS

McKINLEY ENVIRONMENTAL SOLUTIONS

613-620-2255

mckinleyenvironmental@gmail.com

www.mckinleyenvironmental.com



Photograph 1: Looking upstream at the downstream segment of Survey Site #1 (April 12th, 2023).



Photograph 2: Looking downstream at the catch basin at Sheffield Road (April 12th, 2023).





Photograph 3: Looking upstream at the upstream segment of Survey Site #1 (April 12th, 2023).



Photograph 4: Looking upstream at the downstream segment of Survey Site #2 (April 12th, 2023).





Photograph 5: Looking upstream at the upstream segment of Survey Site #2 (April 12th, 2023).



Photograph 6: Looking downstream at the downstream segment of Survey Site #3 (April 12th, 2023).





Photograph 7: Looking upstream at the upstream segment of Survey Site #3 (April 12th, 2023).



Photograph 8: Looking upstream at the downstream segment of Survey Site #4 (April 12th, 2023).





Photograph 9: Looking upstream at the upstream segment of Survey Site #4 (April 12th, 2023).



Photograph 10: Looking upstream at the downstream segment of Survey Site #5 (April 12th, 2023).





Photograph 11: Looking downstream at the upstream segment of Survey Site #5 (April 12th, 2023).

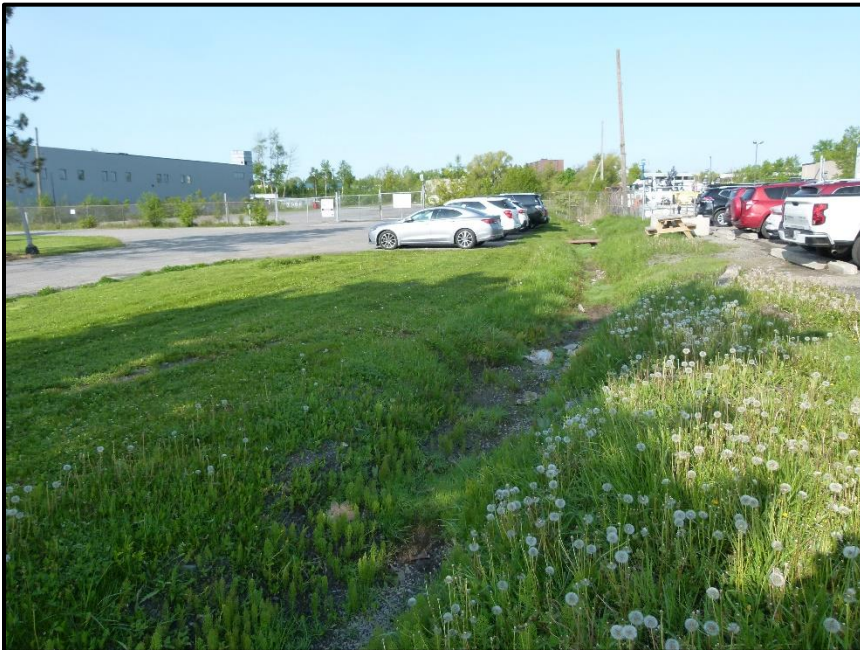


Photograph 12: Looking northwest from the edge of the undeveloped portion of the former railway corridor. Note that there is no upstream channel within the adjacent developed property (April 12th, 2023).





Photograph 13: Looking upstream at the downstream segment of Survey Site #1 (May 24th, 2023).



Photograph 14: Looking upstream at the upstream segment of Survey Site #1 (May 24th, 2023).





Photograph 15: Looking downstream at the downstream segment of Survey Site #2 (May 24th, 2023).



Photograph 16: Looking upstream at the upstream segment of Survey Site #2 (May 24th, 2023).





Photograph 17: Looking upstream at the downstream segment of Survey Site #3 (May 24th, 2023).



Photograph 18: Looking upstream at the upstream segment of Survey Site #3 (May 24th, 2023).





Photograph 19: Looking upstream at the downstream segment of Survey Site #4 (May 24th, 2023).



Photograph 20: Looking upstream at the upstream segment of Survey Site #4 (May 24th, 2023).





Photograph 21: Looking upstream at the downstream segment of Survey Site #5 (May 24th, 2023).



Photograph 22: Looking upstream at the upstream segment of Survey Site #5 (May 24th, 2023).





Photograph 23: Looking upstream at the downstream segment of Survey Site #1 (July 2nd, 2023).



Photograph 24: Looking upstream at the upstream segment of Survey Site #1 (July 2nd, 2023).





Photograph 25: Looking downstream at the downstream segment of Survey Site #2 (July 2nd, 2023).



Photograph 26: Looking upstream at the upstream segment of Survey Site #2 (July 2nd, 2023).





Photograph 27: Looking upstream at the downstream segment of Survey Site #3 (July 2nd, 2023).



Photograph 28: Looking upstream at the upstream segment of Survey Site #3 (July 2nd, 2023).





Photograph 29: Looking upstream at the downstream segment of Survey Site #4 (July 2nd, 2023).



Photograph 30: Looking upstream at the upstream segment of Survey Site #4 (July 2nd, 2023).





Photograph 31: Looking upstream at the downstream segment of Survey Site #5 (July 2nd, 2023).



Photograph 32: Looking upstream at the upstream segment of Survey Site #5 (July 2nd, 2023).

