

Emerald Creek Phase 3 – Headwater Drainage Features Assessment

FINAL REPORT

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Introduction

1.0 INTRODUCTION

Stantec Consulting Ltd. (Stantec) was retained by 8298025 Canada Inc. (the Client) to support their proposed development of the Emerald Creek Phase 3 subdivision (the Project; concept provided in **Appendix A**). Stantec's Environmental Services group (BC1609) was retained to complete a headwater drainage features assessment (HDFA) at 481 Tullamore Street, Ottawa, Ontario (the Site; 18T 452380E, 5013237N) (**Figure 1, Appendix B**) to evaluate and classify the unnamed tributaries to the Spratt Drain municipal drain (headwater drainage features) and to identify appropriate management recommendations for each section of the features anticipated to be impacted by the Project.

Due to historical land use (e.g., agriculture) as well as recent and on-going development observed within the general area (e.g., residential), the headwater drainage features within the Site have been channelized and were observed to be mapped differently by various agencies (**Figure 1, Appendix B**). Vegetation removal within the Site, associated with previous development activities, was observed to occur approximately 10 years prior using historical aerial imagery.



Regulatory Policy Context

2.0 REGULATORY POLICY CONTEXT

The Conservation Authorities Act is the enabling legislation that provides the legal basis for the creation of conservation authorities ("CAs") in Ontario. Generally, the Conservation Authorities Act directs CAs to perform a number of critical functions regarding watershed planning and management including the prevention, elimination, or reduction of loss of life and property from flood hazards and erosion hazards, as well as the conservation and restoration of natural resources.

Section 25 of the Conservation Authorities Act defines a watercourse as "an identifiable depression in the ground in which a flow of water regularly or continuously occurs". Section 28 of the Conservation Authorities Act empowers CAs to make regulations in the area under its jurisdiction, including the prohibition, regulation or permitting for development if the control of flooding, erosion, or the conservation of land may be affected by the development.

Pursuant to *Ontario Regulation 174/06, Development, Interference with Wetlands and Alterations to Shorelines and Watercourses,* prior permission is required from the Rideau Valley Conservation Authority (RVCA) for development within a floodplain, valleylands, wetland, or other hazardous land. Permission is also required from the RVCA for alteration to a river, creek, stream or watercourse or interference with the hydrological function of a wetland.

Through correspondence with the RVCA (Jennifer Lamoureux, Aquatic and Fish Habitat Biologist) on April 19, 2021, it was indicated to Stantec that a Standard Level Assessment was required to assess the headwater drainage features on, and immediately adjacent to, the Site. RVCA indicated that the following components related to a HDFA are required to support proposed physical and/or hydrological modifications to any headwater drainage features on, and immediately adjacent to, the Site:

- Applications to alter headwater drainage features shall be assessed in accordance with the document titled "Evaluation, Classification and Management of Headwater Drainage Features Guideline." (TRCA and CVC 2014)
- Applicants shall pre-consult with the Conservation Authority to ensure that the scope and timing of the HDFA is appropriate for the scale/type of the proposal, availability of information for the feature and the sensitivity of the feature.
- The evaluation of a headwater drainage feature shall include collecting information that may be available in a watershed or subwatershed plan, catchment reports, an environmental management plan, fisheries management plan etc.



Methods

3.0 METHODS

3.1 BACKGROUND DATA COLLECTION

As part of this HDFA at the proposed EOCC, existing conditions and potential natural heritage features (e.g., species at risk (SAR)) within the Study Area were initially identified by reviewing the following available background documents and related information sources:

- Ontario's Natural Heritage Information Centre (NHIC) Make a Natural Heritage Area Map (NDMNRF 2021a)
- Land Information Ontario (LIO) (NDMNRF 2021b)
- Ministry of Agriculture, Food and Rural Affairs (OMAFRA) AgMaps Geographic Information Portal (OMAFRA 2020)
- Rideau Valley Conservation Authority (RVCA) GeoPortal (RVCA 2021)
- RVCA's Lower Rideau River Subwatershed Report 2012: Mosquito Creek Catchment (RVCA 2012)
- RVCA's City Stream Watch: Mosquito Creek 2015 Summary Report (RVCA 2015)
- City of Ottawa Official Plan (2013; including all consolidations)
- Fisheries and Oceans Canada (DFO) Aquatic Species at Risk Mapping (DFO 2021)
- Satellite imagery (Google Earth Pro 2021)

3.2 FIELD DATA COLLECTION

Collection methods in this HDFA followed the guidance provided in the Toronto Region Conservation Authority and the Credit Valley Conservation's *Evaluation, Classification and Management of Headwaters Drainage Features Guidelines* (the Guidelines) (TRCA and CVC 2014). These guidelines use standardized survey methods and a tiered study design to determine the risk of functional impairment to a headwater drainage feature through land development.

As outlined in the Guidelines, this HDFA was completed using the following steps:

- 1. **Evaluation** (consultation with the RVCA, collect background data, collect field data)
- 2. **Classification** (classify the functions of each headwater drainage feature with respect to hydrology, riparian vegetation, fish and fish habitat and terrestrial habitat)
- 3. **Management Recommendations** (provide management options recommendations for headwater drainage features based on the classification of each)

Standard field data collection for this HDFA followed the field procedures outlined in the Ontario Stream Assessment Protocol's module *Assessing Headwater Drainage Features, Section 4, Module 10* (S4:M10) (Stanfield 2013). Spate conditions were observed within the headwater drainage features during the initial assessment (#1) in early May. The headwater drainage features were observed to exhibit base flow conditions during the subsequent assessments (#2 and #3) in May and July, respectively.



Methods

See **Table 3.1** for survey dates and environmental conditions observed during Stantec's HDFA within the Study Area.

Table 3.1 Dates and Environmental Conditions of Stantec's HDFA within the Study Area

Purpose of Investigation	Date	Start/End Time (24 hour)	Weather Conditions	Biologist
 Headwater Drainage Feature Assessment #1 General/SWH/SAR Wildlife Habitat Assessment Fish and Fish Habitat Assessment 	May 6, 2021	1000 – 1400	Temperature: 8 – 10°C Wind (Beaufort scale): 0 Cloud Cover: 30% Precipitation: None 24/hr. Precipitation: None	Josh Mansell & Brennan Obermayer
Headwater Drainage Feature Assessment #2 General/SWH/SAR Wildlife Habitat Assessment	May 27, 2021	0930 – 1330	Temperature: 8 – 13°C Wind (Beaufort scale): 1 Cloud Cover: 0% Precipitation: None 24/hr. Precipitation: None	Josh Mansell
Headwater Drainage Feature Assessment #2 General/SWH/SAR Wildlife Habitat Assessment	July 30, 2021	0800 – 1230	Temperature: 14 – 18°C Wind (Beaufort scale): 1 Cloud Cover: 50% Precipitation: None 24/hr. Precipitation: None	Josh Mansell

As recorded at the Ottawa International Airport, approximately five kilometres (km) north of the Study Area, the following monthly rainfall amounts overlapping with the headwater drainage feature assessments were observed (ECCC 2021):

- April 2021 59.2 mm
- June 2021 99.1 mm
- July 2021 104.1 mm



Headwater Drainage Feature Assessment

4.0 HEADWATER DRAINAGE FEATURE ASSESSMENT

4.1 BACKGROUND DATA COLLECTION

The headwater drainage features on, and immediately adjacent to, the Site were all observed to be either wetland features, engineered swales and historically channelized features. There are no specific fisheries data available for the headwater drainage features, however, the Site is located within the Mosquito Creek subwatershed in the Lower Rideau watershed, as identified in the City of Ottawa's Official Plan (2013). As such, the RVCA's Lower Rideau River Subwatershed Report 2012: Mosquito Creek Catchment (RVCA 2012) and City Stream Watch: Mosquito Creek 2015 Summary Report (RVCA 2015) were used to collect data and both resources have identified the thermal regime of Mosquito Creek as ranging between cool- and warmwater.

The Ministry of Agriculture, Food and Rural Affairs (OMAFRA) AgMaps (2020) identifies the Spratt Drain municipal drain, immediately downstream of the Site, as a DFO Class C drain which typically support a non-sensitive, spring spawning fish community. Additionally, the Ministry of Northern Development, Mines, Natural Resources and Forestry's (NDMNRF) Kemptville District indirectly identifies the Spratt Drain municipal drain as having a restricted in-water activity window from March 15 to June 30 in any given year to protect spring spawning (warmwater) species (NDMNRF 2013).

DFO's Aquatic Species at Risk Mapping (2021) does not identify the headwater drainage features on, and immediately adjacent to, the Site, Spratt Drain municipal drain or Mosquito Creek as Critical Habitat or as potential habitat for aquatic species protected under the SARA.

4.2 EVALUATION

Data collected during the HDFA are used to classify the features proposed to be impacted by the Project and provide appropriate management recommendations. The assessment evaluates the contribution of sediment, nutrients and flow to downstream reaches, as well as the use of these features by fish and wildlife; specifically, SAR.

The Guidelines define headwater drainage features as "non-permanently flowing drainage features that may not have defined bed or banks; they are first-order and zero-order intermittent and ephemeral channels, swales and connected headwater wetlands, but do not include rills or furrows". Through correspondence with the RVCA and review of background data, Stantec confirmed the presence of the headwater drainage features on, and immediately adjacent to, the Site and then applied the Strahler method (Strahler 1957) to determine stream order of the headwater drainage feature.

The 3.23-hectare Site, which is bisected by a proposed extension of Tullamore Street, has been predominantly cleared of woody vegetation which has been graded and levelled with fill. Areas that have been recently filled and graded are dominated by pioneer meadow species including wild carrot (*Daucus carota*) and white sweet-clover (*Melilotus albus*) (**Photos 1 – 6, Appendix C**). There is a small area (~500 m²) in the northeast corner of the Site that was not filled and graded which is dominated by wetland



Headwater Drainage Feature Assessment

vegetation, predominantly *Carex* spp. and broad-leaved cattail (*Typha latifolia*) (**Photos 41 – 44**, **Appendix C**). An approximate 30 m strip of deciduous forest remains along both the northern and southern boundaries of the Site adjacent to the mapped headwater drainage features.

As shown on NHIC (NDMNRF 2021a) and LIO (NDMNRF 2021b), an unevaluated wetland pocket is shown as occurring along the whole eastern boundary of the Site and is shown as being associated with woodlands. The web-based geoOttawa Unevaluated Wetlands 2011 layers shows a larger contiguous unevaluated wetland polygon in the northern section of the Site, which also encompasses the NHIC and LIO mapped wetland.

Based on the Guidelines definition of a headwater drainage feature, a total of two headwater drainage features, separated into eleven distinct reaches, were observed within, or immediately adjacent to, the Site (**Figure 2**, **Appendix A**).

Fish community sampling within the two headwater drainage features did not occur as part of Stantec's HDFA as low water conditions were observed during the late May and July assessment periods. Fish were not observed within any of the headwater drainage features assessed by Stantec as part of this HDFA.

4.3 CLASSIFICATION

During Stantec's 2021 HDFA, reaches were delineated within each headwater drainage feature observed within the Site that are anticipated to be impacted by the Project. The classification of each reach was assessed by collecting data on the following parameters, as defined by the Guidelines:

- 1. Hydrology
- 2. Riparian
- 3. Fish and Fish Habitat
- 4. Terrestrial Habitat

The classification of fish and fish habitat was accomplished by completing a fish and fish habitat assessment on May 6, 2021. Existing conditions and parameter classifications of each reach is summarized below in **Table 4.1**. Photographic records of each reach within each headwater drainage feature are provided in **Appendix C** and HDFA field notes are provided in **Appendix D**.



Table 4.1 Headwater Drainage Features Characteristics and Classifications within the Site

Reach				Featur	е Туре			Chan Dimens			y May 2 ydrolog			e May 2 ydrolog			uly 202 ydrolog			ı	Riparia	ın Veg	etation	l			errestr Habita			Fish I	Habitat		
Headwater Drainage Feature	Length Assessed (m)	Defined Natural Channel	Channelized	No Defined Feature	Swale	Tiled Drainage	Wetland	Feature Width (m)	Bankfull Depth (m)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	None	Lawn	Cropped Land	Меаdow	Scrubland	Forest	Wetland	Breeding Amphib. Wetlands	General Amphib. Habitat	Movement Corridors	No Habitat	Year Round	Seasonal	Contributing	Headwater Drainage Feature Description
ECk3 HDF1 R1-S	- 82	_	*	_				2.0	3.0	Y	16	Y	N	n/a	N	N	n/a	N	_			*	✓	_		_		*				~	This channelized section is located south of the proposed Tullamore Street extension and flows south. It is not connected to ECk3-HDF1-R1-S2 via a culvert under Tullamore Street and is currently receiving flows from the existing roadside ditch south of Tullamore Street and ECk3-HDF1-R2-S1 during periods of high precipitation. The feature was observed to provide seasonal hydrology to downstream areas and may provide seasonal fish habitat, provided barriers to fish are not present further downstream. This section of the HDF is mapped by the NHIC (NDMNRF 2021a), LIO (NDMNRF 2021b), RVCA (2021) and OMAFRA (2020) and is also shown as a Ditch by geoOttawa (2020) (Photos 7 – 11, Appendix C).



Table 4.1 Headwater Drainage Features Characteristics and Classifications within the Site

Reach				Featur	е Туре			Chan Dimens			y May 2 ydrolog			e May 2 ydrolog			uly 202 /drolog				Riparia	ın Veg	etation	l			errestri Habita			Fish I	Habitat		
Headwater Drainage Feature Reach	Length Assessed (m)	Defined Natural Channel	Channelized	No Defined Feature	Swale	Tiled Drainage	Wetland	Feature Width (m)	Bankfull Depth (m)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	None	Lawn	Cropped Land	Meadow	Scrubland	Forest	Wetland	Breeding Amphib. Wetlands	General Amphib. Habitat	Movement Corridors	No Habitat	Year Round	Seasonal	Contributing	Headwater Drainage Feature Description
ECk3- HDF1- R1-S2	75	_					✓	14	n/a	Y	20	N	N	n/a	N	N	n/a	N	✓	_		✓	_	*		✓			✓				This isolated, wetland section is located north of the proposed Tullamore Street extension and flows south. The feature is located within the limits of the geoOttawa (2020) mapped unevaluated wetland. It is not connected to ECk3-HDF1-R1-S1 via a culvert under Tullamore Street and is currently receiving flows from ECk3-HDF1-R1-S3 and the unevaluated wetland north of the feature. This feature does not have a defined channel and was observed to be hydrologically connected to the unevaluated wetland, therefore, the amount of water in the feature is directly related to the seasonal water level of the wetland. The feature is not considered to provide fish habitat. This section of the HDF is mapped by the NHIC (NDMNRF 2021a), LIO (NDMNRF 2021a), LIO (NDMNRF 2021b), RVCA (2021) and OMAFRA (2020) but is not shown by geoOttawa (2020) (Photos 12 – 17, 19, 22 Appendix C).



Table 4.1 Headwater Drainage Features Characteristics and Classifications within the Site

Reach				Featur	е Туре	ı		Chan Dimen			y May 2 ydrolog			e May 2 ydrolog			uly 202 /drolog				Riparia	ın Veg	etation	l			errestri Habitat			Fish	Habitat		
Headwater Drainage Feature Reach	Length Assessed (m)	Defined Natural Channel	Channelized	No Defined Feature	Swale	Tiled Drainage	Wetland	Feature Width (m)	Bankfull Depth (m)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	None	Lawn	Cropped Land	Meadow	Scrubland	Forest	Wetland	Breeding Amphib. Wetlands	General Amphib. Habitat	Movement Corridors	No Habitat	Year Round	Seasonal	Contributing	Headwater Drainage Feature Description
ECk3 HDF1 R1-S3	- 50	_					*	n/a	n/a	Y	10	Z	N	n/a	N	Z	n/a	z						✓	*	✓			✓				This isolated, wetland section is located along the northern boundary of the Site and contributes to flows in ECk3-HDF1-R1-S2. The feature is located within the limits of the geoOttawa (2020) mapped unevaluated wetland. This feature does not have a defined channel and was observed to be hydrologically connected to the unevaluated wetland, therefore, the amount of water in the feature is directly related to the seasonal water level of the wetland. The feature is not considered to provide fish habitat. This section of the HDF is mapped by geoOttawa (2020) as a Watercourse and is not shown by the NHIC (NDMNRF 2021a), LIO (NDMNRF 2021b), RVCA (2021) and OMAFRA (2020). geoOttawa (2020) shows this feature as connecting directly with ECk3-HDF2-R1-S2, however, this connection was not observed by Stantec during this HDFA (Photos 17 – 23, Appendix C).



Table 4.1 Headwater Drainage Features Characteristics and Classifications within the Site

Reach				Featur	е Туре			Chan Dimens			y May 2 ydrolog			e May 2 ydrolog			uly 202 /drolog			l	Riparia	an Veg	etation	1			errestri Habitat			Fish I	Habitat		
Headwater Drainage Feature Reach	Length Assessed (m)	Defined Natural Channel	Channelized	No Defined Feature	Swale	Tiled Drainage	Wetland	Feature Width (m)	Bankfull Depth (m)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	None	Lawn	Cropped Land	Meadow	Scrubland	Forest	Wetland	Breeding Amphib. Wetlands	General Amphib. Habitat	Movement Corridors	No Habitat	Year Round	Seasonal	Contributing	Headwater Drainage Feature Description
ECk3- HDF1- R2-S1	215	-	*	-	-	_		1.0	0.1	Y	90	Y	N	n/a	N	Z	n/a	N				*	√	-		-	-	*	-	-	-	*	This channelized feature observed along the southern boundary of the Site provides flows from the western area of the Site into ECk3-HDF1-R1-S1. The feature was observed to provide seasonal hydrology to downstream areas and may provide seasonal fish habitat, provided barriers to fish are not present further downstream. This section of the HDF is not shown by the NHIC (NDMNRF 2021a), LIO (NDMNRF 2021b), RVCA (2021) or OMAFRA (2020) and is shown as a Ditch in geoOttawa (2020) (Photos 24 – 27, Appendix C).

Table 4.1 Headwater Drainage Features Characteristics and Classifications within the Site

Reach				Featur	е Туре			Char Dimen			y May 2 ydrolog			May 20 ydrolog			uly 202 ydrolog				Riparia	ın Veg	etation	l			errestr Habita			Fish	Habitat		
Headwater Drainage Feature Reach	Length Assessed (m)	Defined Natural Channel	Channelized	No Defined Feature	Swale	Tiled Drainage	Wetland	Feature Width (m)	Bankfull Depth (m)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	None	Lawn	Cropped Land	Меадом	Scrubland	Forest	Wetland	Breeding Amphib. Wetlands	General Amphib. Habitat	Movement Corridors	No Habitat	Year Round	Seasonal	Contributing	Headwater Drainage Feature Description
ECk3· HDF2· R1-S1	0	_	•	_				n/a	n/a	Y	n/a	Y	N	n/a	N	N	n/a	N		_				√	*	_		*	_	_		~	This channelized feature, located west of the Site, was observed to receive all flows from all four reaches within ECk3-HDF2 and is shown by geoOttawa (2020) as a Ditch and Watercourse that directs flows into the Spratt Drain municipal drain ~650 m west of the Site. The feature was observed to provide seasonal hydrology to downstream areas and may provide seasonal fish habitat, provided barriers to fish are not present further downstream. This section of the HDF is not shown by the NHIC (NDMNRF 2021a), LIO (NDMNRF 2021b), RVCA (2021) or OMAFRA (2020). Access to this feature was not provided and was observed from the Site boundary only. As such, no data sheets for this section are provided (Photo 28, Appendix C).

Table 4.1 Headwater Drainage Features Characteristics and Classifications within the Site

Reach				Featur	е Туре			Chan Dimens			y May 2 ydrolog			e May 20 ydrolog			uly 202 /drolog				Riparia	ın Veg	etation	l			errestri Habitat			Fish I	Habitat		
Headwater Drainage Feature Reach	Length Assessed (m)	Defined Natural Channel	Channelized	No Defined Feature	Swale	Tiled Drainage	Wetland	Feature Width (m)	Bankfull Depth (m)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	None	Lawn	Cropped Land	Meadow	Scrubland	Forest	Wetland	Breeding Amphib. Wetlands	General Amphib. Habitat	Movement Corridors	No Habitat	Year Round	Seasonal	Contributing	Headwater Drainage Feature Description
ECk3- HDF2- R1-S2	100	_	*	_				1.25	0.2	Y	90	Y	N	n/a	N	N	n/a	N		_				•	*			✓				✓	This small, channelized feature, shown as a Ditch and Watercourse by geoOttawa (2020), is located within the boundary of the unevaluated wetlands shown by the NHIC (NDMNRF 2021a), LIO (NDMNRF 2021b), RVCA (2021), OMAFRA (2020) and geoOttawa (2020) and is directly connected to ECk3- HDF2-R1-S1. The feature was observed to provide seasonal hydrology to downstream areas and may provide seasonal fish habitat, provided barriers to fish are not present further downstream. This section of the HDF is not shown by the NHIC (NDMNRF 2021a), LIO (NDMNRF 2021b), RVCA (2021) or OMAFRA (2020). geoOttawa (2020) shows this feature as connecting directly with ECk3-HDF1-R1-S3, however, this connection was not observed by Stantec during this HDFA (Photos 30 – 31, Appendix C).



Table 4.1 Headwater Drainage Features Characteristics and Classifications within the Site

Reach				Featur	е Туре	1		Char Dimen			y May 2 ydrolog			e May 2 ydrolog			uly 202 ydrolog				Riparia	an Veg	etation	1			errestr Habita			Fish	Habitat		
Headwater Drainage Feature Reach	Length Assessed (m)	Defined Natural Channel	Channelized	No Defined Feature	Swale	Tiled Drainage	Wetland	Feature Width (m)	Bankfull Depth (m)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	None	Lawn	Cropped Land	Meadow	Scrubland	Forest	Wetland	Breeding Amphib. Wetlands	General Amphib. Habitat	Movement Corridors	No Habitat	Year Round	Seasonal	Contributing	Headwater Drainage Feature Description
ECk3- HDF2- R2-S1	0		*					n/a	n/a	Y	n/a	Y	N	n/a	N	N	n/a	N		-		-	_	*	*			*		_		✓	This medium, channelized feature, shown as a Ditch by geoOttawa (2020), is located within the boundary of the unevaluated wetlands shown by the NHIC (NDMNRF 2021a), LIO (NDMNRF 2021b), RVCA (2021), OMAFRA (2020) and geoOttawa (2020) and flows into ECk3- HDF2-R1-S1. The feature was observed to provide seasonal hydrology to downstream areas and may provide seasonal fish habitat, provided barriers to fish are not present further downstream. This section of the HDF is not shown by the NHIC (NDMNRF 2021a), LIO (NDMNRF 2021b), RVCA (2021) or OMAFRA (2020). Access to this feature was not provided and was observed from the Site boundary only. As such, no data sheets for this section are provided (Photo 28, Appendix C).



Table 4.1 Headwater Drainage Features Characteristics and Classifications within the Site

Reach				Featur	е Туре			Chan Dimens			y May 2 ydrolog			May 20			uly 202 ydrolog			ı	Riparia	an Veg	etation	1			errestri Habita			Fish	Habitat		
Headwater Drainage Feature Reach	Length Assessed (m)	Defined Natural Channel	Channelized	No Defined Feature	Swale	Tiled Drainage	Wetland	Feature Width (m)	Bankfull Depth (m)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	None	Lawn	Cropped Land	Meadow	Scrubland	Forest	Wetland	Breeding Amphib. Wetlands	General Amphib. Habitat	Movement Corridors	No Habitat	Year Round	Seasonal	Contributing	Headwater Drainage Feature Description
ECk3- HDF2- R3-S1	100	-	*	_	_	_		1.25	0.2	Y	90	Y	N	n/a	N	N	n/a	N				-	_	*	*			*	-	_	_	✓	This small, channelized feature, shown as a Ditch and Watercourse by geoOttawa (2020), is located within the boundary of the unevaluated wetlands shown by the NHIC (NDMNRF 2021a), LIO (NDMNRF 2021b), RVCA (2021), OMAFRA (2020) and geoOttawa (2020) and flows into ECk3- HDF2-R3-S1. This feature runs parallel to ECk3-HDF2-R1-S2 and are ~10 m apart from each other. The feature was observed to provide seasonal hydrology to downstream areas and may provide seasonal fish habitat, provided barriers to fish are not present further downstream. This section of the HDF is not shown by any available mapping (Photos 32 – 33, Appendix C).

Table 4.1 Headwater Drainage Features Characteristics and Classifications within the Site

Reach				Featur	е Туре			Chan Dimens			y May 2 ydrolog			May 2 ydrolog			uly 202 /drolog			ı	Riparia	an Veg	etation	l			errestri Habita			Fish	Habitat		
Headwater Drainage Feature Reach	Length Assessed (m)	Defined Natural Channel	Channelized	No Defined Feature	Swale	Tiled Drainage	Wetland	Feature Width (m)	Bankfull Depth (m)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	None	Lawn	Cropped Land	Meadow	Scrubland	Forest	Wetland	Breeding Amphib. Wetlands	General Amphib. Habitat	Movement Corridors	No Habitat	Year Round	Seasonal	Contributing	Headwater Drainage Feature Description
ECk3- HDF2- R4-S1	75		*	ı	_	_		1.25	0.8	Y	15	Y	N	n/a	Ν	N	n/a	N					√	*	*			*		_		*	This medium, channelized feature, shown as a Ditch by geoOttawa (2020), is located along the western boundary of the Site. Located along the boundary of unevaluated wetlands shown by the NHIC (NDMNRF 2021a), LIO (NDMNRF 2021b), RVCA (2021), OMAFRA (2020) and geoOttawa (2020), the feature flows into ECk3-HDF2-R1-S1. The feature was observed to provide seasonal hydrology to downstream areas and may provide seasonal fish habitat, provided barriers to fish are not present further downstream. This section of the HDF is not shown by the NHIC (NDMNRF 2021a), LIO (NDMNRF 2021b), RVCA (2021) or OMAFRA (2020) (Photo 34 – 36, Appendix C).

Table 4.1 Headwater Drainage Features Characteristics and Classifications within the Site

Reach				Featur	е Туре			Chan Dimens			y May 2 ydrolog			e May 2 ydrolog			uly 202 ydrolog				Riparia	ın Veg	etation	ı			errestri Habitat			Fish I	Habitat		
Headwater Drainage Feature Reach	Length Assessed (m)	Defined Natural Channel	Channelized	No Defined Feature	Swale	Tiled Drainage	Wetland	Feature Width (m)	Bankfull Depth (m)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	Water Present (Y/N)	Depth (mm)	Flow (Y/N)	None	Lawn	Cropped Land	Meadow	Scrubland	Forest	Wetland	Breeding Amphib. Wetlands	General Amphib. Habitat	Movement Corridors	No Habitat	Year Round	Seasonal	Contributing	Headwater Drainage Feature Description
ECk3- HDF2- R4-S2	40	-		_	*	-		2.0	1.0	Y	20	Z	N	n/a	Z	Z	n/a	N	-	-		I	*					*	l l	-	_	*	This ill-defined section of ECk3-HDF2-R4, mapped as a Ditch by geoOttawa (2020), is located within the Trans-Northern Pipelines Inc. right-of-way that is dominated by wet meadow species. The feature was observed to provide seasonal hydrology to downstream areas and is not considered to provide fish habitat. This section of the HDF is not shown by the NHIC (NDMNRF 2021a), LIO (NDMNRF 2021b), RVCA (2021) or OMAFRA (2020) (Photo 37 – 40, Appendix C).
ECk3- HDF2- R4-S3	0	-	1	_	*	-	-	n/a	n/a	N	n/a	N	N	n/a	N	N	n/a	N	-	-			-	*	_		-	*		-	-	4	This small, channelized section of ECk3-HDF2-R4, mapped as a Ditch by geoOttawa (2020), is located within a deciduous woodland that was observed from the southern Site boudnary. The feature was observed to provide seasonal hydrology to downstream areas and is not considered to provide fish habitat. This section of the HDF is not shown by the NHIC (NDMNRF 2021a), LIO (NDMNRF 2021b), RVCA (2021) or OMAFRA (2020).



Headwater Drainage Feature Assessment

4.4 MANAGEMENT RECOMMENDATIONS

This section compiles the information collected during Stantec's 2021 reach characteristic and evaluation phase to classify hydrological, riparian, fish and fish habitat and terrestrial components to recommend management decisions for each feature or reach. As outlined in the Guidelines, management recommendations are based on flow characteristics and functions contributing to aquatic and terrestrial habitats (**Table 4.1**). The classification and management recommendation of each reach within the Site are summarized below in **Table 4.2** and shown on **Figure 3**, **Appendix A**.

Table 4.2 Headwater Drainage Feature Classifications and Management Recommendations

Headwater Drainage Feature Reach	Step 1		Step 2	Step 3	Step 4	Managamant	
	Hydrology	Modifiers	Riparian	Fish Habitat	Terrestrial	Management Recommendation	
ECk3-HDF1-R1-S1	Contributing	None observed	Important	Contributing	Contributing	Protection	
ECk3-HDF1-R1-S2	Valued	None observed	Important	None	Important	Protection	
ECk3-HDF1-R1-S3	Valued	None observed	Important	None	Important	Protection	
ECk3-HDF1-R2-S1	Contributing	None observed	Important	Contributing	Contributing	Protection	
ECk3-HDF2-R1-S1*	Contributing	None observed	Important	Contributing	Valued	Conservation	
ECk3-HDF2-R1-S2	Contributing	None observed	Important	Contributing	Valued	Conservation	
ECk3-HDF2-R2-S1*	Contributing	None observed	Important	Contributing	Valued	Conservation	
ECk3-HDF2-R3-S1	Contributing	None observed	Important	Contributing	Valued	Conservation	
ECk3-HDF2-R4-S1	Contributing	None observed	Important	Contributing	Contributing	Conservation	
ECk3-HDF2-R4-S2	Contributing	Pipeline RoW Maintenance	Valued	Contributing	Contributing	Conservation	
ECk3-HDF2-R4-S3	Contributing	None observed	Important	Contributing	Contributing	Conservation	

^{*} Denotes access to the feature was not provided. Classifications and management recommendations are estimated based on Stantec observations.

According to the Guidelines, all of the headwater drainage feature reaches on, and immediately adjacent to, the Site are considered to receive Protection or Conservation as a management recommendation.

Based on the concept provided for the Project (**Appendix A**), direct impacts (e.g., re-routing, stormwater inputs) to the assessed headwater drainage features are not anticipated, therefore, all of the assessed values associated with each reach are anticipated to remain functional.

Management recommendations for the Protection and Conservation of the functions of each reach should be considered and implemented through the subsequent design stages of the Project. One of the primary considerations to retain the function of all headwater drainage features on the Site should be to maintain downstream flows to the Spratt Creek municipal drain.



Headwater Drainage Feature Assessment

Where **Table 4.2** recommends Protection of a reach, the following measures from the Guidelines should be considered and incorporated into the design of the Project:

- Protect and/or enhance the existing feature including the riparian vegetation surrounding the feature
- Maintain hydroperiod
- If necessary, use natural channel design techniques to restore and enhance habitat features;
 realignment not generally permitted
- Design and locate stormwater management system to avoid impacts (e.g., sediment, temperature increases) to the feature

Where **Table 4.2** recommends Conservation of a reach, the following measures from the Guidelines should be considered and incorporated into the design of the Project:

- Maintain, relocate and/or enhance feature including the riparian vegetation surrounding the feature
- If upstream catchment area is proposed to be removed for development, restore lost functions through enhanced lot level controls (i.e., increase infiltration using permeable pavers), as feasible
- Maintain or replace flows using mitigation measures
- Maintain or replace external flows
- Use natural channel design techniques to maintain or enhance overall productivity of the reach

Summary

5.0 SUMMARY

As part of this HDFA to to support 8298025 Canada Inc.'s proposed development of the Emerald Creek Phase 3 subdivision, two headwater drainage features, separated into eleven (11) reaches, were observed within Site. Management recommendations for each of the four reaches are based on flow characteristics and functions contributing to aquatic and terrestrial habitats (**Table 4.2**).

Based on the concept provided for the Project (**Appendix A**), direct impacts (e.g., re-routing, stormwater inputs) to the assessed headwater drainage features are not anticipated, therefore, all of the assessed values associated with each reach are anticipated to remain functional. Additionally, the Client is considering installing a corrugated steel culvert under Tullamore Street that will re-connect ECk3-HDF1-R1-S2 and ECk3-HDF1-R1-S1 which will allow flows and nutrients downstream to the Spratt Municipal Drain and may allow potential fish passage to upstream habitats.



References

6.0 REFERENCES

- Environment of Climate Change Canada (ECCC). 2021. Government of Canada. Retrieved October 13, 2021 from Daily Data Report for April, June and July 2021 Ottawa, Ontariohttps://climate. weather.gc.ca/historical_data/search_historic_data_stations_e.html?searchType=stnName&timef rame=1&txtStationName=ottawa&searchMethod=contains&optLimit=yearRange&StartYear=1840 &EndYear=2021&Year=2021&Month=10&Day=12&selRowPerPage=25
- Fisheries and Oceans Canada (DFO). 2021. Aquatic species at risk map. Retrieved from https://www.dfo-mpo.gc.ca/species-especes/sara-lep/map-carte/index-eng.html
- Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNRF). 2021a. Natural Heritage Information Centre (NHIC). Provincial status of plants, wildlife and vegetation communities database. Ministry of Natural Resources and Forestry, Peterborough. Retrieved from: https://www.ontario.ca/page/make-natural-heritage-area-map
- Ministry of Northern Development, Mines, Natural Resources and Forestry (NDMNRF). 2021b. Land Information Ontario (LIO). On-line Natural Heritage Mapping and Natural Heritage Information Database. Retrieved from: https://www.ontario.ca/page/land-information-ontario
- Ministry of Northern Development, Mines, Natural Resources and Forestry (MNDMNRF). 2013. In-water Work Timing Window Guidelines. March 11, 2013.
- Municipality of North Grenville. 2018. Official Plan of the Municipality of North Grenville.
- Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA). 2020. Agricultural Information Atlas. Retrieved from: http://www.omafra.gov.on.ca/english/landuse/gis/portal.htm
- Rideau Valley Conservation Authority (RVCA). 2012. Lower Rideau River Subwatershed Report 2012: Mosquito Creek Catchment.
- Rideau Valley Conservation Authority (RVCA). 2015. City Stream Watch: Mosquito Creek 2015 Summary Report.
- Rideau Valley Conservation Authority (RVCA). 2021. RVCA GeoPortal. Retrieved from: https://gis.rvca.ca/html5/?viewer=rvcageoportal_staff#
- Stanfield, L. 2013. Ontario Stream Assessment Protocol, Section 4: Module 10, Assessing Headwater Drainage Features. Ontario, Canada.
- Toronto Region Conservation Authority and Credit Valley Conservation (TRCA and CVC). 2014.

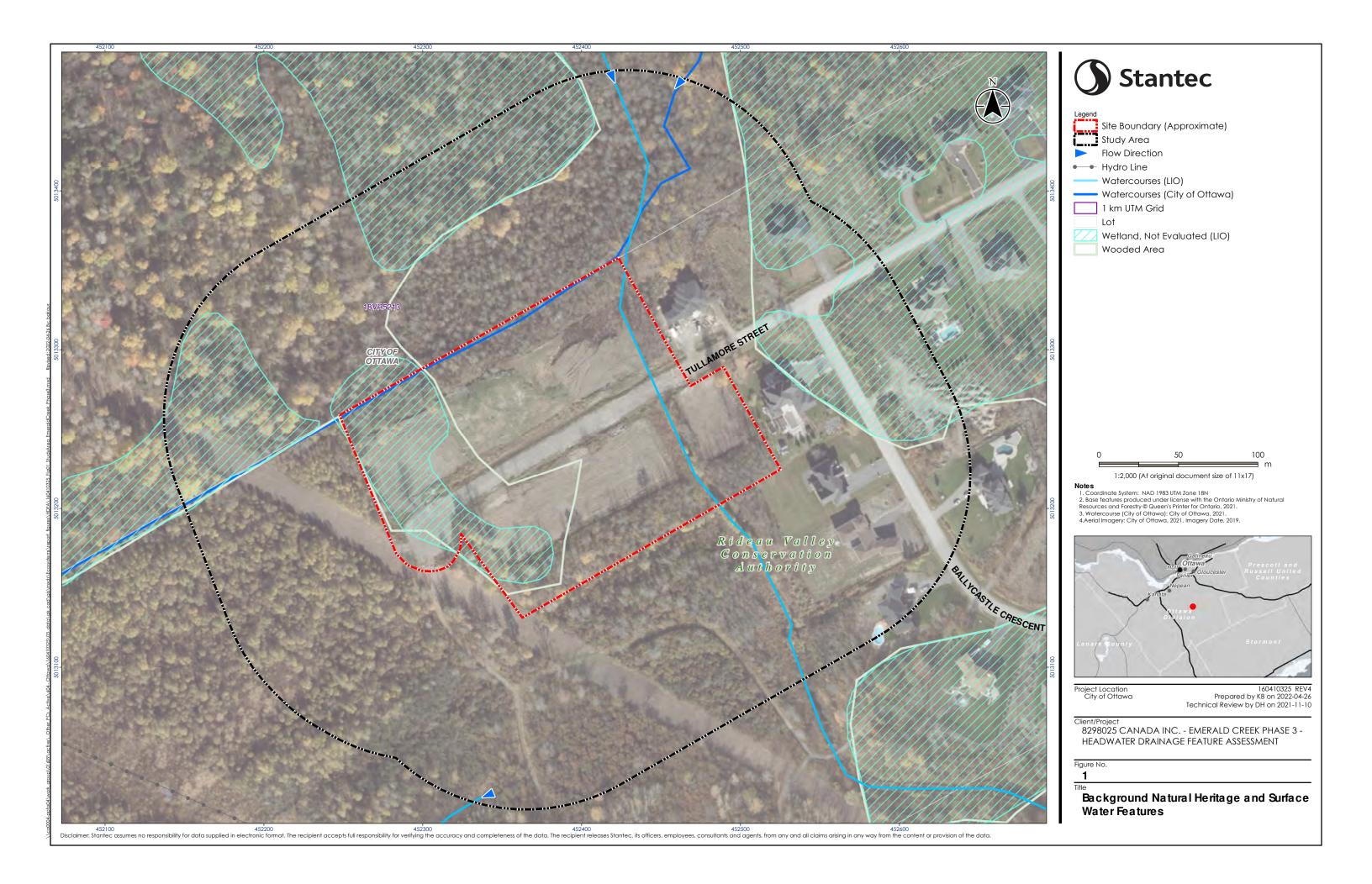
 Evaluation, Classification and Management of Headwater Drainage Features Guidelines. Toronto Region Conservation Authority and Credit Valley Conservation.

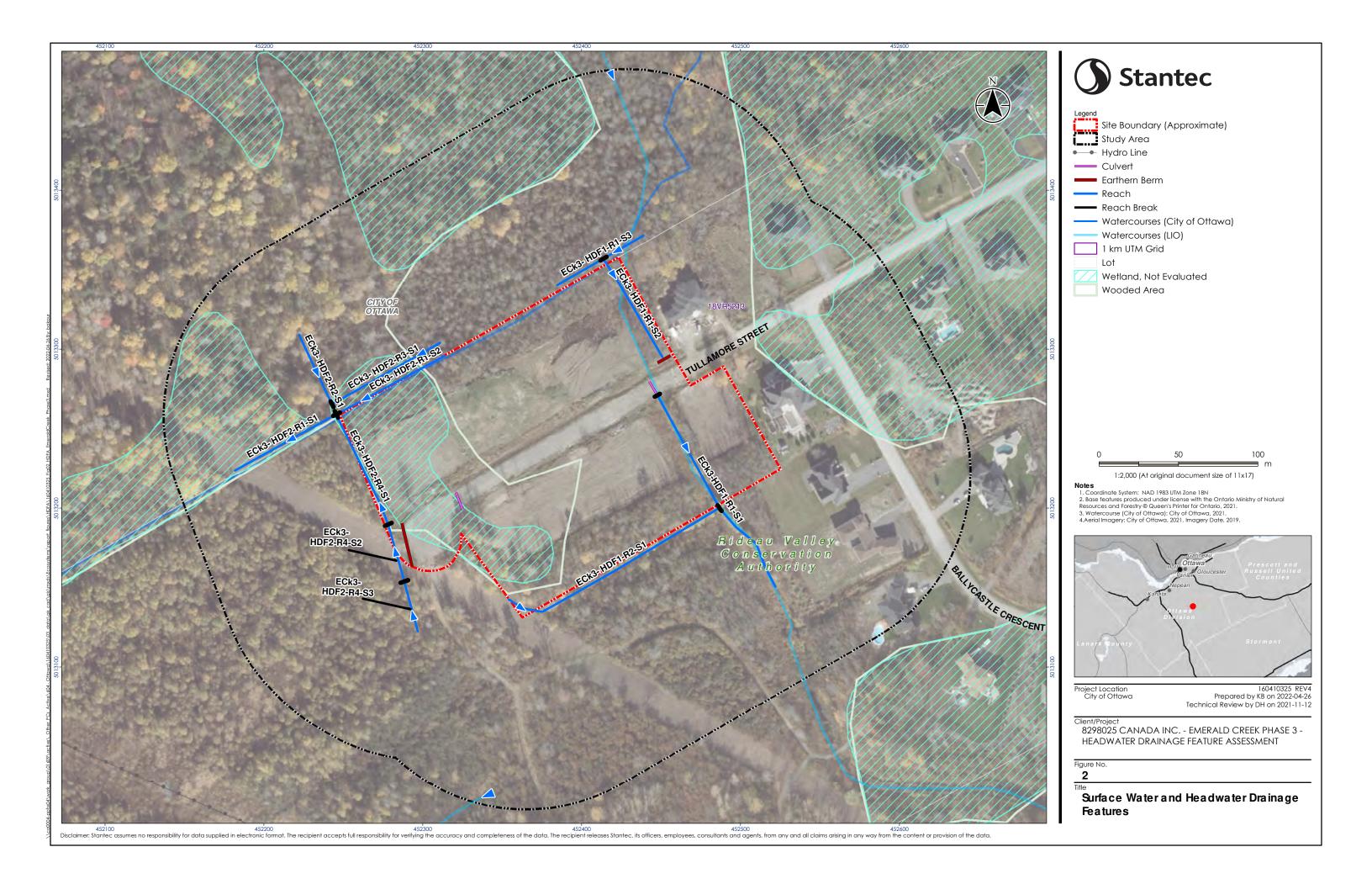


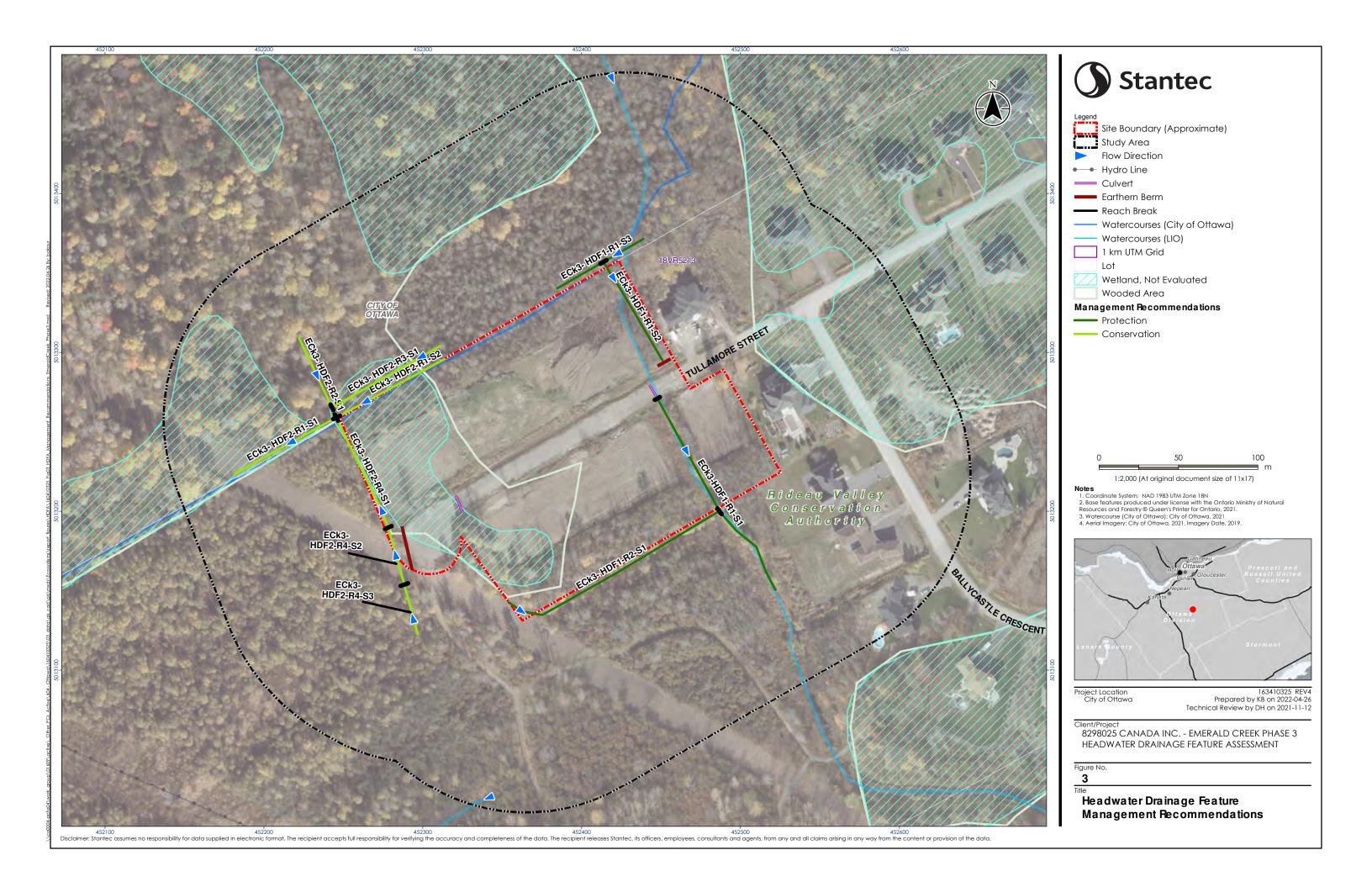
APPENDIX A:Emerald Creek Phase 3 Subdivision Concept



APPENDIX B: Figures







APPENDIX C: Photographic Record of Site Conditions



Photo 1: Existing conditions within the Site along the Tullamore Street extension (May 27). Looking west from the eastern Site boundary.



Photo 2: Existing conditions observed within the existing Emerald Creek subdivision along Tullamore Street immediately east of the Site (May 6).



Photo 3: Existing conditions within the previously cleared areas of the Site north of Tullamore Street (May 6). Looking east.



Photo 4: Existing conditions within the previously cleared areas of the Site south of Tullamore Street (May 27). Looking north.



Photo 5: Existing conditions within the previously cleared areas of the Site south of Tullamore Street (July 30). Looking west.



Photo 6: Existing conditions within the Site along the Tullamore Street extension (July 30). Looking east from the western Site boundary.



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Photo 7: Existing conditions of ECk3-HDF1-R1-S1 looking south from the Tullamore Street extension (May 6).



Photo 8: Existing conditions observed within the middle of ECk3-HDF1-R1-S1 (May 6). Looking south and downstream.



Photo 9: Existing conditions of ECk3-HDF1-R1-S1 looking south from the Tullamore Street extension (May 27).



Photo 10: Existing conditions observed within the middle of ECk3-HDF1-R1-S1 (May 27). Looking south and downstream.



Photo 11: Existing conditions of ECk3-HDF1-R1-S1 looking south from the Tullamore Street extension (July 30).



Photo 12: Looking towards ECk3-HDF1-R1-S2 north from the Tullamore Street extension (May 27). Note earthen berm (red line) isolates this reach from ECk3-HDF1-R1-S1 south of Tullamore Street.



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Photo 13: Existing conditions observed within the middle of ECk3-HDF1-R1-S2 (May 6). Looking north and upstream.



Photo 14: Existing conditions observed within the middle of ECk3-HDF1-R1-S2 (May 27). Looking north and upstream.



Photo 15: Water and substrate conditions observed within ECk3-HDF1-R1-S2 (May 27).



Photo 16: Existing conditions observed within the middle of ECk3-HDF1-R1-S2 (July 30). Looking north and upstream.



Photo 17: Existing conditions at the confluence of ECk3-HDF1-R1-S2 and ECk3-HDF1-R1-S3 (May 6). Looking east.



Photo 18: Existing conditions observed within the middle of ECk3-HDF1-R1-S3 west of ECk3-HDF1-R1-S2 (May 6). Looking west and upstream.



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Photo 19: Existing conditions at the confluence of ECk3-HDF1-R1-S2 and ECk3-HDF1-R1-S3 (May 27). Looking northeast.



Photo 20: Existing conditions observed within the middle of ECk3-HDF1-R1-S3 west of ECk3-HDF1-R1-S2 (May 27). Looking west and upstream.



Photo 21: Water and substrate conditions observed within ECk3-HDF1-R1-S3 (May 27).



Photo 22: Existing conditions at the confluence of ECk3-HDF1-R1-S2 and ECk3-HDF1-R1-S3 (July 30). Looking northeast.



Photo 23: Existing conditions observed within the middle of ECk3-HDF1-R1-S3 west of ECk3-HDF1-R1-S2 (May 27). Looking west and upstream.



Photo 24: Existing conditions of ECk3-HDF1-R2-S1 south of the Tullamore Street extension (May 6). Looking south and downstream.



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Photo 25: Existing conditions observed within the middle of ECk3-HDF1-R2-S1 (May 6). Looking west and upstream.



Photo 26: Existing conditions observed within the middle of ECk3-HDF1-R2-S1 (May 27). Looking east and downstream.



Photo 27: Existing conditions observed within the middle of ECk3-HDF1-R2-S1 (July 30). Looking east and downstream.



Photo 28: Existing conditions observed within ECk3-HDF2-R1-S1 along the western boundary of the Site (May 27). Looking west and downstream.



Photo 29: Existing conditions observed at the confluence of ECk3-HDF2-R2-S1 and ECk3-HDF2-R3-S1 (May 27) at the northwest corner of the Site. Looking north and upstream.



Photo 30: Existing conditions observed within the middle of ECk3-HDF2-R1-S2 (May 6). Looking east and upstream.



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Photo 31: Existing conditions observed within the middle of ECk3-HDF2-R1-S2 (May 6). Looking east and upstream.



Photo 32: Existing conditions observed within the middle of ECk3-HDF2-R3-S1 (May 6). Looking east and upstream.



Photo 33: Existing conditions observed within the middle of ECk3-HDF2-R3-S1 (May 27). Looking east and upstream.



Photo 34: Existing conditions observed within the middle of ECk3-HDF2-R4-S1 (May 6). Looking south and upstream.



Photo 35: Existing conditions observed within the middle of ECk3-HDF2-R4-S1 (May 27). Looking south and upstream.



Photo 36: Existing conditions observed within the middle of ECk3-HDF2-R4-S1 (July 30). Looking north and downstream.



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Photo 37: Existing conditions of the ECk3-HDF2-R4-S2 (May 6) within the Trans-Northern Pipelines Inc. right-of-way. Looking northwest.



Photo 38: Existing conditions observed within the middle of ECk3-HDF2-R4-S2 (May 6). Looking northwest and downstream.



Photo 39: Existing conditions observed within the middle of ECk3-HDF2-R4-S2 (May 27). Looking northwest and downstream.



Photo 40: Existing conditions observed within the middle of ECk3-HDF2-R4-S2 (July 30). Looking northwest and downstream.



Photo 41: Existing conditions observed within the northeast corner of the Site that has not been filled and graded within the limits of the geoOttawa unevaluated wetland (May 6). Looking north towards ECk3-HDF1-R1-S3.

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Photo 42: Existing conditions observed within the northeast corner of the Site that has not been filled and graded within the limits of the geoOttawa unevaluated wetland (May 6). Looking northeast towards ECk3-HDF1-R1-S2.



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Photo 43: Existing conditions observed within the northeast corner of the Site that has not been filled and graded within the limits of the geoOttawa unevaluated wetland (May 27). Looking northeast towards ECk3-HDF1-R1-S2.



Photo 44: Existing conditions observed within the northeast corner of the Site that has not been filled and graded within the limits of the geoOttawa unevaluated wetland (July 30). Looking northeast towards ECk3-HDF1-R1-S2.



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APPENDIX D: Field Data Sheets

		L	Inconstrair	ned Headwate	r Drainage Feat	ıre Assessme	nt	
Date:	May 6	1 702	/ Proie	ect#: \(\acid_{\0})	95 Recorde	r/Crew: 5- Ma	well Bobs	males "
Stream Nam				m Code: Sp. sitt			1-4c3-A.	
Site Limits:	-0-	Upstream 19				sessment: Sar		ted HDF
		Downstream			3199 N	□ Sai		
Direction of	Assessment		(Upsti		ownstream	☐ Sai		tream network
Flow Influe	ence	☐ Fres	_	-	Spate (2)		☐ Baseflow (3)	
Flow Condi	ition	☐ Dry	(1) Inding Water (2)		☐ Interstitial Flow (3)	☐ Substantial Flow (5	5)
Feature Ty	pe		ned Natural Chan	nnel (1)	☐ No Defined Feat	ure (4)	☐ Swale (7)	
			nnelized or Const		☐ Tiled Feature (5)		☐ Roadside Ditch (8)	
			i-thread (3)		☐ Wetland (6)		☐ Pond (9)	
Feature Ve	getation	☐ None (1)	☐ Lawn (2)	☐ Cropped (3)	☐ Meadow (4)	Scrubland (5)	Wetland(6) ☐ Fores	it (7)
Riparian V	postation							
0 - 1.5 m		□None (1)	□Lawn (2)	□Cropped (3)	☐Meadow (4)	Scrubland (5)	etland (6)	set (7)
	Right Bank	☐ None (1)	☐ Lawn (2)	☐ Cropped (3)		And the second of the second of the second of		orest (7)
4 5 40								
1.5 - 10 m		□ None (1)	☐ Lawn (2)	Cropped (3)	☐ Meadow (4)	and the second second		orest (7)
	Right Bank	□ None (1)	☐ Lawn (2)	☐ Cropped (3)	☐ Meadow (4) M	Scrubland (5)	Wetland (6)	orest (7)
10 - 30 m	Left Bank	☐ None (1)	☐ Lawn (2)	☐ Cropped (3)	☐ Meadow (4)	Scrubland (5)	Wetland (6)	orest (7)
	Right Bank	□ None (1)	☐ Lawn (2)	Cropped (3)	☐ Meadow (4)	Scrubland (5)	Wetland (6)	orest (7)
	Substrate (Si	2.M3)	(Hard Pan)	Silt, Sand (0.0	6-2 mm) Gravel (22-6	6 mm) Cobble (67-24	9 mm) Boulder (250 m	m) Bedrock
	Substrate (Sa	2.M3) te (S2.M3)	100		6-2 mm) Gravel (22-6	6 mm) Cobble (67-24		
	nant Substrat	2.M3) te (S2.M3)				6 mm) Cobble (67-24	9 mm) Boulder (250 m	
Sub-Domir	nant Substrat	2.M3) te (S2.M3)	< 10% Minimal	(1) 10-4	0% Moderate (2)	40 - 60% High (3)		(4)
Sub-Domir Feature Ro Width Meas Channel Di	nant Substrat	2.M3) te (S2.M3) Can't Mea	< 10% Minimal asure (1) (m):	(1) 10 - 4 Bankfull (2) [0% Moderate (2)	40 - 60% High (3) Estimated (4)	> 60% Extreme	(4)
Sub-Domir Feature Ro Width Meas Channel Di	nant Substrat	2.M3) te (S2.M3) Can't Mea	< 10% Minimal asure (1)	(1) 10 - 4 Bankfull (2) [0% Moderate (2) L Mean Width (3)	40 - 60% High (3) Estimated (4)	GIS (5) Measure/G	(4)
Sub-Domin Feature Ro Width Meas Channel Di Entrenchm	nant Substrate oughness surement imensions nent 124 To	2.M3) te (S2.M3) Can't Mea Feature Width tal: > 40	< 10% Minimal asure (1) (m):	(1)	0% Moderate (2) L Mean Width (3) Bankfull Dep	40 - 60% High (3) Estimated (4) th (mm) m	GIS (5) Measure/G	e (4) SIS (6)
Sub-Domin Feature Ro Width Meas Channel Di Entrenchm Surface Flo	nant Substrate pughness surement imensions ment PA To	Can't Mea Feature Width tal: Perched C	< 10% Minimal asure (1)	(1)	O% Moderate (2) Mean Width (3) Bankfull Dep m Right Ba	1 40 - 60% High (3) Estimated (4) th (mm) m tance by Time (3)	GIS (5) Measure/G Total width Estimated	(4) sis (6) m
Sub-Domin Feature Ro Width Meas Channel Di Entrenchm Surface Flo	nant Substrate oughness surement imensions nent A To ow Method I Width (m)	2.M3) te (S2.M3) Can't Mea Feature Width tal: > 40 Wetted D	< 10% Minimal asure (1)	(1)	O% Moderate (2) Mean Width (3) Bankfull Dep m Right Ba Head (2) Dis	th (mm) m tance by Time (3)	GIS (5) Measure/G Total width Estimated	(4) Time (s)
Sub-Domin Feature Ro Width Meas Channel Di Entrenchm Surface Flo	nant Substrate pughness surement imensions ment PA To	2.M3) te (S2.M3) Can't Mea Feature Width tal: > 40 Wetted D O 1	(m): < 40 Culvert (1) epth (mm) 2 3	(1)	O% Moderate (2) Mean Width (3) Bankfull Dep m Right Ba Head (2) Dis	1 40 - 60% High (3) Estimated (4) th (mm) m tance by Time (3)	GIS (5) Measure/G Total width Estimated	(4) sis (6) m
Sub-Domin Feature Ro Width Meas Channel Di Entrenchm Surface Flo	nant Substrate oughness surement imensions nent A To ow Method I Width (m)	2.M3) te (S2.M3) Can't Mea Feature Width tal: > 40 Wetted D O 1	(m):	(1)	O% Moderate (2) Mean Width (3) Bankfull Dep m Right Ba Head (2) Dis	th (mm) m tance by Time (3)	GIS (5) Measure/G Total width Estimated	(4) (4) Time (s)
Sub-Domin Feature Ro Width Meas Channel Di Entrenchm Surface Flo Wetted	nant Substrate oughness surement imensions nent	2.M3) te (S2.M3) Can't Mea Feature Width tal: > 40 Wetted D O 1	< 10% Minimal asure (1)	(1)	O% Moderate (2) Mean Width (3) Bankfull Dep m Right Bathead (2) District District Dep m Volume (L) 3 1 2	th (mm) m tance by Time (3)	Total width Estimated ance (m) 2 3 1	(4) (5) (6) (7) (7) (8) (9) (1) (1) (1) (2) (3)
Sub-Domin Feature Ro Width Meas Channel Di Entrenchm Surface Flo Wetted	nant Substrate oughness surement imensions nent A To ow Method I Width (m)	Can't Mea Feature Width tal: > 40 Wetted D O 1	(m): < 40 Culvert (1) epth (mm) 2 3 (None (1)	(1)	O% Moderate (2) Mean Width (3) Bankfull Dep m Right Bathead (2) Dis m) Volume (L) 3 1 2	th (mm) tance by Time (3) Gully (4)	Total width Cance (m) 2 3 1 Outlet Scour (state of the content	(4) (5) (6) (7) (7) (8) (9) (1) (1) (1) (2) (3)
Sub-Domin Feature Ro Width Meas Channel Di Entrenchm Surface Flo Wetted	nant Substrate oughness surement imensions nent	Can't Mea Feature Width tal: > 40 Wetted D O 1	< 10% Minimal asure (1)	(1)	O% Moderate (2) Mean Width (3) Bankfull Dep m Right Bathead (2) District District Dep m Volume (L) 3 1 2	40 - 60% High (3) Estimated (4)	Total width Carrented Compared to the content of	(4) (5) (7) (1) (1) (1) (2) (3) (5)
Sub-Domin Feature Ro Width Meas Channel Di Entrenchm Surface Flo Wetted	nant Substrate oughness surement imensions nent	2.M3) te (S2.M3) Can't Mea Feature Width tal: > 40 Wetted D O Adjacent	Culvert (1) Page 10% Minimal assure (1) (m):	(1)	O% Moderate (2) Mean Width (3) Bankfull Dep m Right Ba Head (2) Dis m) Volume (L) 3 1 2 Rill and Gully (3) Instream Bank E	40 - 60% High (3) Estimated (4)	Total width Carrented Compared to the content of	(4) SIS (6) (4) Time (s) 2 3
Sub-Domin Feature Ro Width Meas Channel Di Entrenchm Surface Flo Wetted	nant Substrate oughness surement imensions nent	2.M3) Ite (S2.M3) Can't Mea Feature Width Ital: > 40 Wetted D Oc 1 Adjacent Feature	Culvert (1) Sheet Eros Sheet Eros Sheet Eros	(1)	O% Moderate (2) Mean Width (3) Bankfull Dep m Right Bathead (2) Distream Bank E Rill and Gully (3) Instream Bank E Rill and Gully (3)	40 - 60% High (3) Estimated (4)	Total width Cance (m) 2 3 1 Outlet Scour (8) Outlet Scour (8)	(4) SIS (6) (4) Time (s) 2 3
Sub-Domin Feature Ro Width Meas Channel Di Entrenchm Surface Flo Wetted	nant Substrate pughness surement imensions ment IVA To pow Method I Width (m) Transport	2.M3) Ite (S2.M3) Can't Mea Feature Width tal: > 40 Wetted D Adjacent Feature	Culvert (1) Sheet Eros (mm): Sheet Eros (mm): Where (1) Sheet Eros (mm): Sheet Eros (mm):	m Left Bank	O% Moderate (2) Mean Width (3) Bankfull Dep m Right Ba Head (2) Dis m) Volume (L) 3 1 2 Rill and Gully (3) Instream Bank E Instream Bank E	day and the first of the first	Total width Cance (m) 2 3 1 Outlet Scour (8) Outlet Scour (8)	(4) Sils (6) (4) Time (s) 2 3

Date 1	دره رک	D	Uncons	Strained Headwater Drainage Feature Assessment Pg. 2 of 2 Field Assessment: Sample # 1 Sample # 2 Sample # 3
	04.55		700	POINT FEATURE DATA
Ground	water Indical	ors U	None D	Perched Height (mm): → ↑ Perched Heigh! (mm): Jumping Height (mm): → △ Jumping Height (mm): Other: Watercress: Seepage Bubbling Stained Other:
WP#	Photo#	Code	Category	Description
				Historically converted to SMO-well-A Leath been lacks stand Leath been lacks stand SMO-well-A dat sheet.
Addit	onal Notes	dainin	nog	
Site B	reak 💆	Feature Typ	100	ent (vock, bem) or collector ure Modifier Flow Conditions Feature Vegetation Riparian Vegetation
Point Categ	Data	-	Ongoing and A	Active (1) Historic Evidence (2) Reported but No Evidence (3) 4) Unknown (5)
ABCDEFGHLJKLMNOPG	Seepage are Watercress - Outlet (tile or o Inlet (tile or o Beaver dam Manmade da Other barrier Potential con Channel harc Culvert - note Flow transitio Flow transitio Flow transitio	a - measure o estimate total other) - record ther) - record ther) - record ther) - record ther) - record there as to fish movem tamination so, the total type, size and point D/S - fin point M/S- fl during non-fitent source	r estimate length of surface area occid flow status as per flow status as per ched height and judgerched height and ent ource (storm sewer ted by rip-rap, arm d whether or not plow condition charow condition charows.	er feature flow. Estimate volume <0.5 l/sec or >0.5 l/sec. Measure temperature: feature flow. Estimate volume to be <0.5 l/sec or >0.5 l/sec. umping height d jumping height. outlet or industrial discharge pipe). nour stone, or gabion baskets. perched_ If perched record perched height and jumping height. nges from dry to standing water, independent of segment break nges from minimal to substantial surface flow, independent of segment break nanges from dry/standing water to interstitial flow, independent of segment break

	Unconstraine	ed Headwater	Drainage Feature	Assessment
	Upstream ST WP# Upstream Upstr	40 E 5433 452450E am Doi	MD W Site Code: ろいり Field Assessin ろいりかんり wnstream	5MD-WC1-A
Flow Influence	Freshet (1)	3	Spate (2)	☐ Baseflow (3)
Flow Condition	Dry (1) Standing Water (2)		☐ Interstitial Flow (3) ☐ Minimal Flow (4)	☐ Substantial Flow (5)
Feature Type	Defined Natural Channe Channelized or Constra Multi-thread (3)		□ No Defined Feature (4 □ Tiled Feature (5) □ Wetland (6)	Swale (7) Roadside Ditch (8) Pond (9)
Feature Vegetation	□ None (1) □ Lawn (2)	☐ Cropped (3)	☐ Meadow (4) ☐ Sc	
Right Bank	None (1)	Cropped (3) Cropped (3)	Meadow (4) Scrub	land (5)
	None (1) Lawn (2) None (1) Lawn (2)	☐ Cropped (3) ☐ Cropped (3)	Meadow (4) Sc Meadow (4) Sc	그렇게 하고 있는데 가게 하는 그녀가 되는데 가게 내려가 되지 않는데 그는 그렇게 되었다. 이렇게 하다 다른데 하는데 하는데 하는데 하는데 하는데 하는데 하는데 하는데 하는데 하는
10 - 30 m Left Bank Right Bank	□ None (1) □ Lawn (2) □ None (1) ♠ Lawn (2)	☐ Cropped (3) ☐ Cropped (3)	Meadow (4) ☐ Sc ☐ Meadow (4) ☐ Sc	
Dominant Substrate (S2. Sub-Dominant Substrate	M3)	Silt Sand (0.06		Gradient (%): Obble (67-249 mm) Boulder (250 mm) Bed
Feature Roughness Width Measurement	Can't Measure (1)		% Moderate (2) 40 Mean Width (3) s	- 60% High (3)
	Feature Width (m):	VI. 3 . 10 . 10 .	Bankfull Depth (m	100
Entrenchment Tota				
Surface Flow Method Wetted Width (m)	☐ Perched Culvert (1) Wetted Depth (mm) 1 2 3	Hydraulic H Hydraulic head (mm 1 2 N/U		Distance (m) Time (s) 1 2 3 1 2 N / P
Sedimoni Fransport	Adjacent None (1) Sheet Erosio Feature None (1) Sheet Erosio	☐ Rill (2)	☐ Rill and Gully (3) ☐ Instream Bank Erosio ☐ Rill and Gully (3) ☐ Instream Bank Erosio	☐ Gully (4) ☐ Outlet Scour (5)
Sediment Deposition None (1)	Measures (mm). Minimal: < 5 mm (2)	Moderate: 5-30 mm (3) D Substantial: 31-80	0 mm (4) Extensive: > 80 mm (5)

1	May 6/2	10		strained Head			The second secon		e#2	Pg. 2 of 2 Sample # 3
	W # 30			301-1-0-1-0-1	T FEATU					- 100
round	mer Measurer werer ardicat	WP#	None	Perched Height (mm Perched Height (mm Watercress	n): n): Seepage	Jumping Jumping Bubbling	Height (mm): Height (mm): Stained	Other:		
WP#	Photo#	Code	Category				Description			
				Cane Cane	Tellan	ore of	doced a freel. St Stadute	4D-WC	red	
							E 50	324 N	VI	
				V,c5	- 299	50-3	5.5			
د) Site Br	rner (Nor +L ea	e T Feat	stc has	marsh □ Flow Co	-like	habitat Feature Ve	w la		an Vegetation
rigge oint [Data	Other: Con	Ongoing and			Evidence (2) Reported t	out No Evidence	e (3)	
atego	DATA KEY:		No Evidence	(4)	Unknow	n (5)				
A B C C C C C C C C C C C C C C C C C C	Spring/upwell Seepage area Watercress - Outlet (tile or Inlet (tile or of Beaver dam - Manmade dar Other barrier Potential cont Channel hard Culvert - note Flow transition Flow transition	a - measure or estimate total other) - record finesure perconsure properties of the measure properties of the measure properties of the movem amination south and the moving - indicated type, size and point D/S - fine point M/S- fire point D-S/IF-1 during non-fit	r estimate length surface area occ of flow status as per ched height and j perched height are ent urce (storm sewer ed by rip-rap, are d whether or not j low condition cha	er feature flow. Estima feature flow. Estima umping height id jumping height routlet or industrial d mour stone, or gabior perched. If perched r inges from dry to star neges from dry/star	ge occurs ate volume <0 te volume to be scharge pipe). baskets. ecord perched ading water, inc substantial su	e <0.5 l/sec o	r >0.5 l/sec. Imping height, segment break dependent of segr	ment break		

	Unconstrained Headwate	r Drainage Feature Assessmen	t
Stream Name: Smc Site Limits: 19 Good Carth D Direction of Assessment:	ownstream WP# HSDHIDE 5	MD W C Site Code: Since Site Code: Sam Sam Sam Sam	pple 2
Flow Influence	Freshet (1)	Spate (2)	Baseflow (3)
Flow Condition	Dry (1) Standing Water (2)	☐ Interstitial Flow (3) ☐ Minimal Flow (4)	☐ Substantial Flow (5)
Feature Type	Defined Natural Channel (1) Channelized or Constrained (2) Multi-thread (3)	☐ No Defined Feature (4) ☐ Tiled Feature (5)	Swale (7) Roadside Ditch (8) Pond (9)
Feature Vegetation	☐ None (1) ☐ Lawn (2) ☐ Cropped (3)		Wetland(6) 🔯 Forest (7)
	✓ None (1) □ Lawn (2) □ Cropped (3) □ None (1) □ Lawn (2) □ Cropped (3)		etland (6) Forest (7) Wetland (6) Forest (7)
	☐ None (1) ☐ Lawn (2) ☐ Cropped (3) ☐ None (1) ☐ Lawn (2) ☐ Cropped (3)		Wetland (6) Forest (7) Wetland (6) Forest (7)
	☐ None (1) ☐ Lawn (2) ☐ Cropped (3) ☐ None (1) ☐ Lawn (2) ☐ Cropped (3)		Wetland (6) Forest (7) Wetland (6) Forest (7)
Distance (m): Dominant Substrate (S2.N Sub-Dominant Substrate (13)		Gradient (%): 9 mm) Boulder (250 mm) Bedrock
Feature Roughness Width Measurement NA Channel Dimensions	Can't Measure (1) Bankfull (2)	40% Moderate (2)	≥ 60% Extreme (4) GIS (5)
Entrenchment PA Total	> 40 m	m Right Bankm	Total widthm
Surface Flow Method [Wetted Width (m)	Perched Culvert (1) Hydraulic head (n 1 2 3 1 2	nm) Volume (L) Dista	nce (m) Time (s)
	djacent None (1) Rill (2) Sheet Erosion (6)	☐ Rill and Gully (3) ☐ Gully (4) ☐ Instream Bank Erosion (7)	☐ Outlet Scour (5) ☐ Other (8)
Sedimoni Transport	eature None (1) Rill (2) Sheet Erosion (6)	☐ Rill and Gully (3) ☐ Gully (4) ☐ Instream Bank Erosion (7)	Outlet Scour (5) Other (8)

Dar .	May w/o	O) 340			/ater Drainage Fe Field Assessment:		ent Sample # 2	Pg. 2 of 2 Sample # 3
***	Street Street	The same of the same of			FEATURE DA			
Ground	arrier Measurer Iwater Indicat	wP#	None	Perched Height (mm) Perched Height (mm) Watercress	Jumping	Height (mm): Height (mm): G Stained	Other:	-
WP#	Photo #	Code	Category			Description		
				See hor	ner dala C	-CMC x	ng-7.	
Site B	reak	Feature Typ		ture Modifier	(In leep	☐ Feature Veget	ation Ripar	ian Vegetation
Point Categ	Data		Ongoing and		Historic Evidence (2	2) Reported but I	No Evidence (3)	* westerd propo
-	DATA KEY:		NO EVIDENCE	.41	Olikilowii (O)			30000
АВСОЕГСНІ ЈК L М Z ОР	Spring/upwel Seepage are Watercress - Outlet (tile or o Beaver dam Manmade da Other barrier Potential con Channel hard Culvert - note Flow transitio Flow transitio	a - measure or estimate total other) - record ther) - record from measure percord measure percord in measure percord in measure percord in movement amination source in point D/S - flow point D/	estimate length surface area occ if flow status as pelow status as pelow status as pelowed height and judicial perched height are ent orce (storm sewelled by rip-rap, and whether or not ow condition challed by condition challed by condition challed by condition challed in the state of the s	er feature flow. Estimate reature flow. Estimate umping height and jumping height r outlet or industrial dis mour stone, or gabion perched. If perched re anges from dry to standages from minimal to hanges from dry/standages from dry/	ge occurs ate volume <0.5 l/sec or >0 e volume to be <0.5 l/sec or >0 scharge pipe).	or >0.5 l/sec. umping height. If segment break independent of segment	l break	

las

	Unconstrained Headwater	r Drainage Feature Assessment
Oate	Upstream 187 WP# 452554E 50	SMD - WC3 - B SMD - WC3 - B Sample 1 Unconnected HDF:
Direction of Assessment		USAMPle 2 □ Not connected ownstream □ Sample 3 to downstream network
Flow Influence	☐ Freshet (1)	Spate (2) Baseflow (3)
Flow Condition	Dry (1) Standing Water (2)	☐ Interstitial Flow (3) ☐ Substantial Flow (5) ☐ Minimal Flow (4)
Feature Type	Defined Natural Channel (1) Channelized or Constrained (2) Multi-thread (3)	□ No Defined Feature (4) □ Swale (7) □ Tiled Feature (5) □ Roadside Ditch (8) □ Wetland (6) □ Pond (9)
Feature Vegetation	☐ None (1) ☐ Lawn (2) ☐ Cropped (3)	☐ Meadow (4) Scrubland (5) ☐ Wetland(6) ☐ Forest (7)
Riparian Vegetation 0 - 1.5 m Left Bank Right Bank	□ None (1) □ Lawn (2) □ Cropped (3) □ None (1) □ Lawn (2) □ Cropped (3)	☐ Meadow (4) ☐ Scrubland (5) ☐ Welland (6) ☐ Forest (7) ☐ Meadow (4) ☐ Scrubland (5) ☐ Wetland (6) ☐ Forest (7)
1.5 - 10 m Left Bank Right Bank	□ None (1) □ Lawn (2) □ Cropped (3) □ None (1) □ Lawn (2) □ Cropped (3)	☐ Meadow (4) Scrubland (5) ☐ Wetland (6) ☐ Forest (7) ☐ Meadow (4) Scrubland (5) ☐ Wetland (6) ☐ Forest (7)
10 - 30 m Left Bank Right Bank	☐ None (1) ☐ Lawn (2) ☐ Cropped (3) ☐ None (1) ☐ Lawn (2) ☐ Cropped (3)	Meadow (4) Scrubland (5) Wetland (6) Forest (7) Meadow (4) Scrubland (5) Wetland (6) Forest (7)
Distance (m): 1 A Dominant Substrate (S Sub-Dominant Substra	Clay (Hard Pan) Silt Sand (0.0)	
Feature Raughness Width Measurement Channel Dimensions	Can't Measure (1) Bankfull (2) Feature Width (m):	0% Moderate (2)
Entrenchment To	tal:	m Right Bankm Total widthm
Surface Flow Method Wetted Width (m) * No	Perched Culvert (1) Hydraulic Wetted Depth (mm) Hydraulic head (mi	2/
Sediment Transport Sediment Deposition	Adjacent	☐ Rill and Gully (3) ☐ Gully (4) ☐ Outlet Scour (5) ☐ Instream Bank Erosion (7) ☐ Other (8) ☐ Rill and Gully (3) ☐ Gully (4) ☐ Outlet Scour (5) ☐ Instream Bank Erosion (7) ☐ Other (8)
Mone (1)	Minimal: < 5 mm (2)	(3) Substantial: 31-80 mm (4) Extensive: > 80 mm (5)

15:-	طورداء	140		strained Headwater Drainage Feature Assessment Pg. 2 of 2 Field Assessment: Sample # 1 Sample # 2 Sample # 3
				POINT FEATURE DATA
Found	y e/ Measuren water Indicato Nection	WP#	None	Perched Height (mm): Perched Height (mm): Jumping Height (mm): Jumping Height (mm): Watercress Seepage Bubbling Stained Other: Present Comment:
WP#	Photo#	Code	Category	Description
				Rack bern I Sit borner @
				18T 452456E 5631811
Site B	. IV E.3	Feature Typ		ture Modifier
Trigge		Other: Con		
Point Categ			Ongoing and No Evidence	Active (1) Historic Evidence (2) Reported but No Evidence (3) (4) Unknown (5)
100	DATA KEY:		10 - 11901190	VV
ABCDEFGH	Seepage are: Watercress - Outlet (tile or of line) (tile or of Beaver dam - Manmade da Other barrier Potential conti	a - measure or estimate total other) - record ther) - record f measure per m - measure p to fish movem amination sou	estimate length surface area occ if flow status as pelow status as pelohed height and perched height are ent urce (storm sewelled by rip-rap, ar	per feature flow. Estimate volume <0.5 l/sec or >0.5 l/sec. Measure temperature, or feature flow. Estimate volume to be <0.5 l/sec or >0.5 l/sec.

Part - s. in tellingung a la	Add comments of	Unconstra	ned Headwate	r Drainage Feature As	ssessment	
ate:	May	6, 2021 Pro	ject#: Yarnos	Recorder/Crew:	3 Marsell B.C	stranger.
iream Nar	ue. Zu	D- W(Z-A str	eam Code: Soral	MD W Site Code:	SMD-WC2	- AA
ite Limits:				2009GN Field Assessmen	t: 📕 Sample 1 Unc	onnected HDF:
4		Downstream WP#	452245 E			Not connected
irection of	Assessment.	Up:	stream 🗆 D	ownstream	☐ Sample 3 to d	lownstream network
low Influe	ence	☐ Freshet (1)		Spate (2)	☐ Baseflow (3)	
low Cond	ition	☐ Dry (1) ☐ Standing Water (2)		Interstitial Flow (3) Minimal Flow (4)	☐ Substantial F	Flow (5)
eature Ty	pe	☐ Defined Natural Cha	annel (1)	☐ No Defined Feature (4)	Swale (7)	
		Channelized or Con	strained (2)	☐ Tiled Feature (5)	☐ Roadside Dit	ch (8)
		☐ Multi-thread (3)		☐ Wetland (6)	Pond (9)	
eature Ve	getation	□ None (1) □ Lawn (2)	☐ Cropped (3)	☐ Meadow (4) ☐ Scrubla	and (5) (Wetland(6)	Forest (7)
iparian V	egetation				6	
- 1.5 m	Left Bank Right Bank	□ None (1) □ Lawn (2) □ None (1) □ Lawn (2)	☐Cropped (3) ☐ Cropped (3)	☐Meadow (4) ☐ Scrubland ☐ Meadow (4) ☐ Scrubla		Forest (7)
5 10 m	Left Bank					
.5 - 10 m	Right Bank	☐ None (1) ☐ Lawn (2) ☐ None (1) ☐ Lawn (2)	☐ Cropped (3) ☐ Cropped (3)	☐ Meadow (4) ☐ Scrubla ☐ Meadow (4) ☐ Scrubla		Forest (7) Forest (7)
0 - 30 m	Left Bank	☐ None (1) ☐ Lawn (2)	Cropped (3)	☐ Meadow (4) ☐ Scrubla		Forest (7)
	Right Bank	☐ None (1) ☐ Lawn (2)	☐ Cropped (3)	Meadow (4) Scrubba	and (5) Wetland (6)	☐ Forest (7)
	Substrate (S2	None .	Silt Sand (0.0	6-2 mm) Gravel (22-66 mm)	Cobble (67-249 mm) Boulder (250 mm) Bedrock
			- M			
eature Ro		☐ < 10% Minima	_	0% Moderate (2)		
Vidth Mea	surement	Can't Measure (1)	Bankfull (2)	☐ Mean Width (3) ☐ Estima	ted (4) GIS (5) 🙀 Meas	sure/GIS (6)
hannel D	imensions	Feature Width (m):	25	Bankfull Depth (mm)	182- 9	0
ntrenchm	oT Acane	al: > 40 m	0 m Left Bank _	m Right Bank	m Total width	m
urface Ele	ow Method	Perched Culvert (1)	Mydraulic	Head (2) Distance by	Time (3)	nated (4)
unace Fit	Width (m)	Wetted Depth (mm)	Hydraulic head (m		Distance (m)	Time (s)
		1 2 3	MZ S	3 1 2 3 NA	1 N2 3	$1 N_{\perp}^{2}$
Wetted	25	10	- 25° C			
Wetted		Adjacent None (1)	☐ Rill (2)		Gully (4) U Outlet So	cour (5)
Wetted	25 Transport		☐ Rill (2)			12.13
Wetted		Adjacent None (1) Sheet Erd Feature None (1)	□ Rill (2) sion (6) □ Rill (2)	☐ Rill and Gully (3) ☐ Instream Bank Erosion (7 ☐ Rill and Gully (3)	Other (8)	cour (5)
Wetted 1.		Adjacent None (1)	□ Rill (2) sion (6) □ Rill (2)	☐ Rill and Gully (3) ☐ Instream Bank Erosion (7	Other (8)	cour (5)

+SMD-UCD-AC rod Soupled

* SMD-WC2-A rd sampled.

-	M .	AND THE PERSON NAMED IN				7.0	eature Asses		Pg. 2 of 2
Oate	det (0/3	(2)	#: 160				Sample # 1	☐ Sample # 2	Sample # 3
-	AND THE CO	and the contract of the second	annanna madeus maj era danser aktor mje Millerno, sor ak e 24. a 20 majaga deskrekati	POI	NT FEAT	URE DA	TA		
Ground	errier Measuren dwater Indicato bllection	wP#	g-manage and a second		nm):	Jumping Bubblin	g Height (mm): g Height (mm): g Stained	Vae dos	
WP#	Photo#	Code	Category				Description		
Addit	tional Notes 2 nd	Fouto	e 10	15m	AC AC		AB - AA	ticle	~ wcz-AB
Site B	reak 💹	Feature Typ		ture Modifier		Conditions			parian Vegetation
Trigge	er 🗆	Other: Com							
Point Categ			Ongoing and No Evidence			ic Evidence (own (5)	(2) Reported	but No Evidence (3)	
_	DATA KEY:			`					
ABCDEFGHIJKLMZOPGRS	Spring/upwellis Seepage area Watercress - e Outlet (tile or of Inlet (tile or of Inlet) Channade dam Other barrier the Potential contact Channel harder Culvert - note Flow transition flow tr	- measure or estimate total softer) - record flower) - record flowers are percent - measure percent - modern - modern - indicate type, size and point D/S - flopoint D/S - flopoint D-S/IF-during non-fisent source	estimate length surface area occ flow status as per thed height and jerched height are ent roce (storm sewe ed by rip-rap, and whether or not low condition cha	er feature flow. Estr feature flow. Estr jumping height and jumping height or outlet or industria mour stone, or gab perched. If perched anges from dry to s anges from dry/st	timate volume nate volume to discharge pip- tion baskets. d record perch- tanding water, to substantial	e). ed height and independent of surface flow, i	jumping height.	ment break	

Date:	May 6, 2021 Project #: Varyer	95 Recorder/Crew J. Marsell B. Observer	tet-
Stream Name:	Smo LCZ - ABiream Code: Sprat		
Site Limits:	Upstream 18T WP# H509WE 50	Sample 1 Unconnected HD Sample 2 □ Not connect	
Direction of Assessmen		wnstream	networ
Flow Influence	☐ Freshet (1)	■ Spate (2) □ Baseflow (3)	
Flow Condition	☐ Dry (1) ☐ Standing Water (2)	☐ Interstitial Flow (3) ☐ Substantial Flow (5) ☐ Minimal Flow (4)	
Feature Type	☐ Defined Natural Channel (1) ☐ Channelized or Constrained (2) ☐ Multi-thread (3)	□ No Defined Feature (4) Swale (7) □ Tiled Feature (5) □ Roadside Ditch (8) □ Wetland (6) □ Pond (9)	
Feature Vegetation	☐ None (1) ☐ Lawn (2) ☐ Cropped (3)	☐ Meadow (4) ☐ Scrubland (5) ☐ Wetland(6) ☐ Forest (7)	
Riparian Vegetation 0 - 1,5 m Left Bank Right Bank	□ None (1) □ Lawn (2) □ Cropped (3) □ None (1) □ Lawn (2) □ Cropped (3) □ -	☐ Meadow (4) ☐ Scrubland (5) ☐ Wetland (6) ☐ Forest (7) ☐ Meadow (4) ☐ Scrubland (5) ☐ Wetland (6) ☐ Forest (7)	
1.5 - 10 m Left Bank Right Bank	□ None (1) □ Lawn (2) □ Cropped (3) □ None (1) □ Lawn (2) □ Cropped (3)	☐ Meadow (4) ☐ Scrubland (5) ☑ Wetland (6) ☐ Forest (7 ☐ Meadow (4) ☐ Scrubland (5) ☑ Wetland (6) ☐ Forest (7	
10 - 30 m Left Bank Right Bank	□ None (1) □ Lawn (2) □ Cropped (3) □ None (1) □ Lawn (2) □ Cropped (3)	☐ Meadow (4) ☐ Scrubland (5) ☐ Wetland (6) ☐ Forest (7 ☐ Meadow (4) ☐ Scrubland (5) ☐ Wetland (6) ☐ Forest (7	
Distance (m): Dominant Substrate (Sub-Dominant Substrate		-2 mm) Gravel (22-66 mm) Cobble (67-249 mm) Boulder (250 mm) Be	edrock
Feature Roughness Width Measurement		% Moderate (2) 40 - 60% High (3)	
Channel Dimensions	Feature Width (m): \ .95	Bankfull Depth (mm)	
Entrenchment T	otal: > 40 m Ceft Bank	m Right Bankm Total width	m
Surface Flow Method Wetted Width (m)	Perched Culvert (1) Wetted Depth (mm) 1 2 3 1 2 1 5 15 5 9 0		3
	Adjacent None (1) Rill (2) Sheet Erosion (6)	☐ Rill and Gully (3) ☐ Gully (4) ☐ Outlet Scour (5) ☐ Instream Bank Erosion (7) ☐ Other (8) ☐ Rill and Gully (3) ☐ Gully (4) ☐ Outlet Scour (5)	
Sediment Transport	Feature None (1) Rill (2) Sheet Erosion (6)	☐ Instream Bank Erosion (7)	

	M.d.		Uncon	strained He	eadwater Di	ainage Fe	eature Assessn	nent	Pg. 2 of 2 # 2 Sample # 3
Liate.	alul		114 160		INT FEAT		Sample # 1	Sample #	Sample #3
Ground	rrier Measurer water Indicate	ors U		Perched Heigh Perched Heigh Watercress Present	t (mm): t (mm): Seepage	Jumping Jumping Bubblin	g Height (mm): g Height (mm):	Other:	
WP#	Photo #	Code	Category				Description		
				Car	person 1	0 5h	D-WCD-	AC.	
				Pard	16/ + +1		to 5MT		
Addit	ional Notes	:							
-									
Site B		Feature Typ	pe	ture Modifier	Flow	Conditions	☐ Feature Vege	etation \square F	Riparian Vegetation
Point Categ	Data		Ongoing and			ic Evidence (2 own (5)	2) Reported but	No Evidence ((3)
	DATA KEY:	-					· · · · · · · · · · · · · · · · · · ·		
P Q	Seepage area Watercress - Outlet (tile or Inlet (tile or of Beaver dam - Manmade dan Other barrier Potential cont Channel hard Culvert - note Flow transition Flow transition Flow transition	a - measure or estimate total other) - record fher) - record f measure perd m - measure perd mination south ening - indical type, size and n point D/S - fling point M/S-fling point D-S/IF-I during non-fient source	r estimate length surface area oct of flow status as pellow status as pellow status as pellow status as pellow status as perched height and perched height all area (storm sewer led by rip-rap, and whether or not low condition challow condition challow condition challow status area of the status are percentaged and the status area of t	per feature flow. Est jumping height and jumping height or outlet or indust mour stone, or g perched. If perchanges from dry tranges from dry	Estimate volume to the trial discharge pigabion baskets, ned record perchostantial to substantial to substantial	be <0.5 l/sec one). ed height and joindependent of surface flow, in		nt break	

	Unconstrained Headwater	Drainage Feature Assessment
Site Limits: Direction of Assessment:	Upstream 16T WP# 452718E 50 Downstream WP# W50245E 50	Recorder/Crew: SMO-WCD-B SINGLU Field Assessment: Sample 1 Unconnected HDF: Sample 2 Not connected Dwnstream
Flow Influence	☐ Freshet (1)	Spale (2) 🔲 Baseflow (3)
Flow Condition	Dry (1) Standing Water (2)	☐ Interstitial Flow (3) ☐ Substantial Flow (5) ☐ Minimal Flow (4)
Feature Type	Defined Natural Channel (1) Channelized or Constrained (2) Multi-thread (3)	□ No Defined Feature (4) □ Swale (7) □ Tilled Feature (5) □ Roadside Ditch (8) □ Wetland (6) □ Pond (9)
Feature Vegetation	☐ None (1) ☐ Lawn (2) ☐ Cropped (3)	☐ Meadow (4) ☐ Scrubland (5) Wetland(6) ☐ Forest (7)
Riparian Vegetation 0 - 1.5 m Left Bank Right Bank	None (1) □ Lawn (2) □ Cropped (3) □ None (1) □ Lawn (2) □ Cropped (3)	☐ Meadow (4) ☐ Scrubland (5) ☐ Wetland (6) ☐ Forest (7) ☐ Meadow (4) ☐ Scrubland (5) ☐ Wetland (6) ☐ Forest (7)
1.5 - 10 m Left Bank Right Bank	None (1)	☐ Meadow (4) ☐ Scrubland (5) ☐ Wetland (6) ☐ Forest (7) ☐ Meadow (4) ☐ Scrubland (5) ☐ Wetland (6) ☐ Forest (7)
10 - 30 m Left Bank Right Bank	None (1) ☐ Lawn (2) ☐ Cropped (3) ☐ None (1) ☐ Lawn (2) ☐ Cropped (3)	☐ Meadow (4) ☐ Scrubland (5) ☐ Wetland (6) ☐ Forest (7) ☐ Meadow (4) ☐ Scrubland (5) ☐ Wetland (6) ☑ Forest (7)
Dominant Substrate (S Sub-Dominant Substra	2.M3)	6-2 mm) Gravel (22-66 mm) Cobble (67-249 mm) Boulder (250 mm) Bedrock
Feature Roughness Width Measurement		0% Moderate (2)
Channel Dimensions		Bankfull Depth (mm) 3 0 0
Surface Flow Method	Perched Culvert (1) Hydraulic	
Wetted Width (m)	Wetted Depth (mm) Hydraulic head (m	
Settiment Transport	Adjacent None (1) Rill (2) Sheet Erosion (6) None (1) Rill (2) Sheet Erosion (6)	☐ Rill and Gully (3) ☐ Gully (4) ☐ Outlet Scour (5) ☐ Instream Bank Erosion (7) ☐ Other (8) ☐ Rill and Gully (3) ☐ Gully (4) ☐ Outlet Scour (5) ☐ Instream Bank Erosion (7) ☐ Other (8)
Sediment Deposition None (1)	Minimal: < 5 mm (2) Moderate: 5-30 mm	(3) Substantial: 31-80 mm (4) Extensive: > 80 mm (5)

a. N	Les col nor			strained Headwater Drainage Feature Assessment Pg. 2 of 2 Field Assessment: Sample # 1 Sample # 2 Sample # 3
-	112/20			POINT FEATURE DATA
Ground	rrier Measuren water Indicate	WP#	None	Perched Height (mm): Perched Height (mm): Jumping Height (mm):
WP#	Photo#	Code	Category	Description
				Corrects to both
				5NO-WO1
				SMP-VED AA T 900
				SMD-WD-AC. rallace
Site B	r 🗆	Feature Typ	nments	ture Modifier
Point I			Ongoing and	이 전기를 잃었다.
Catego	DATA KEY:		No Evidence	(4) Unknown (5)
V	Seepage area Watercress - Outlet (tile or Inlet (tile or or Beaver dam - Manmade dan Other barrier t Potential cont Channel hard Culvert - note Flow transition Flow transition Flow transition	a - measure or estimate total other) - record f measure percon - indication soulening - indication point D/S - floor point D/S - floor point D-S/IF-1 during non-fire	estimate length surface area occ I flow status as pelow status as pelowed height and justiced height are ent ent or community of the sewer ed by rip-rap, and whether or not ow condition chaps we condition chaps we condition chaps are occupant.	er feature flow. Estimate volume <0.5 l/sec or >0.5 l/sec. Measure temperature. releature flow. Estimate volume to be <0.5 l/sec or >0.5 l/sec. umping height routlet or industrial discharge pipe). mour stone, or gabion baskets. perched. If perched record perched height and jumping height. singes from dry to standing water, independent of segment break nges from minimal to substantial surface flow, independent of segment break hanges from dry/standing water to interstitial flow, independent of segment break
2	Dredging of ch			
3	Offline pond			
-	Other			

	Unconstrained Headwater	Drainage Feature Assessment	
Date: May 6	Project#: Youture	Recorder/Crew 5. Mass	Il B. Ocemajer.
	D-WCZ-C Stream Code: 5pra		wc2-B1_
Site Limits.	Upstream 187 WP# 4500818 5	Sample Sample Sample	1 Unconnected HDF:
Direction of Assessment:		wnstream Sample	
Flow Influence			Baseflow (3)
Flow Condition	Dry (1) Standing Water (2)	☐ Interstitial Flow (3) ☐ S ☐ Minimal Flow (4)	Substantial Flow (5)
Feature Type	Defined Natural Channel (1) Channelized or Constrained (2) Multi-thread (3)	□ No Defined Feature (4) □ Tiled Feature (5) □ □	Swale (7) Roadside Ditch (8) Pond (9)
Feature Vegetation	☐ None (1) ☐ Lawn (2) ☐ Cropped (3)		and(6) Forest (7)
Riparian Vegetation			
0 - 1.5 m Left Bank Right Bank	□ None (1) □ Lawn (2) □ Cropped (3) □ None (1) □ Lawn (2) □ Cropped (3)	Meadow (4) ☐ Scrubland (5) ☐ Wetland Meadow (4) ☐ Scrubland (5) ☐ Wetland (5) ☐ Wetland (5) ☐ Wetland (5)	
1.5 - 10 m Left Bank Right Bank	□ None (1) □ Lawn (2) □ Cropped (3) □ None (1) □ Lawn (2) □ Cropped (3)	Meadow (4) ☐ Scrubland (5) ☐ Wetl ☐ Meadow (4) ☐ Scrubland (5) ☐ Wetl	
10 - 30 m Left Bank Right Bank	None (1) ☐ Lawn (2) ☐ Cropped (3) ☐ None (1) ☐ Lawn (2) ☐ Cropped (3)	☐ Meadow (4) ☐ Scrubland (5) ☐ Wetl. ☐ Meadow (4) ☐ Scrubland (5) ☐ Wetl.	
Channel Gradient (\$4.M	17) Wisual (1) Clinometer (2) Laser	Level (3) Survey Level (4) Other (5)	LiDAR (6)
Distance (m): "A	Elevation (cm)		ient (%):
Dominant Substrate (S2	Clay (Hard Pan) Silt Sand (0.06	-2 mm) Gravel (22-66 mm) Cobble (67-249 mm)	Boulder (250 mm) Bedrock
Sub-Dominant Substrat	te (S2.M3)		
Feature Roughness	☐ < 10% Minimal (1) ☐ 10 - 40	% Moderate (2) 40 - 60% High (3)	> 60% Extreme (4)
Width Measurement	☐ Can't Measure (1) ☐ Bankfull (2) ☐	Mean Width (3) Estimated (4) GIS	(5) Measure/GIS (6)
Channel Dimensions		Bankfull Depth (mm)	
Entrenchment To	ital: > 40 m	m Right Bank m	Total widthm
Surface Flow Method	Perched Culvert (1)	lead (2) Distance by Time (3)	Estimated (4)
Wetted Width (m)	Wetted Depth (mm) Hydraulic head (mm	1) Volume (L) Distance (3 1 2 3 1 2	m) Time (s) 3 1 2 3
godomini Transucii	Adjacent None (1) Rill (2) Sheet Erosion (6)		Outlet Scour (5) Other (8)
	Feature None (1) Rill (2) Sheet Erosion (6)	☐ Rill and Gully (3) ☐ Gully (4) ☐	Outlet Scour (5) Other (8)
Sediment Deposition	Measures (mm):		
	Minimal: < 5 mm (2)	3) Substantial: 31-80 mm (4) Exte	nsive: > 80 mm (5)

er Measurem ater Indicato ection Photo #	WP#	None Absent Category	Perched Height (mm): Perched Height (mm): Perched Height (mm): Perched Height (mm): Watercress Seepage Bubbling Stained Other: Description
Photo #	Code	Category	Description
Photo #	Code	Category	Description
			+ 5MD -WCD-BB rod surveyed
			- he excep-
		1	
		e	ture Modifier
			지사 그 이 경에서 보다 보다 그는 없이 있다면 하나 있습니다. 이 사람이 없는 그 사람이 없는 것이 없어 없는 것이 없어 없는 것이 없다면 하다 하나 없다면 하다 없다면 하다 없다면 없다면 하다 하다 없다면 하다 하다 없다면 하
ATA KEY:		THE EVICENCE	(4) GIRRIGHT (6)
Seepage area Natercress - o Dutlet (tile or ot Reaver dam - Manmade dar Other barrier t Potential cont Channel hard Culvert - note Flow transitior Flow transitior Flow transitior Flow transitior Flow transition	a - measure or estimate total: other) - record filmeasure perom - measure perom - measure profish movem amination sou ening - indicat type, size and point D/S - film point D/S-film point D-S/IF-I during non-fisent source	estimate length surface area octiflow status as people of the status area of the status	of bank where seepage occurs cupied per feature flow. Estimate volume <0.5 l/sec or >0.5 l/sec. Measure temperature. r feature flow. Estimate volume to be <0.5 l/sec or >0.5 l/sec. jumping height ind jumping height er outlet or industrial discharge pipe). mour stone, or gabion baskets. perched. If perched record perched height and jumping height anges from dry to standing water, independent of segment break changes from dry/standing water to interstitial flow, independent of segment break
5000 C C C C C C C C C C C C C C C C C C	ak y ATA KEY: pring/upwelli eepage area /atercress - o let (tile or of eaver dam - lanmade dar ther barrier to otential cont hannel hard ulvert - note low transitior ow transitior ow transitior sh observed otential nutrii	ATA KEY: pring/upwelling - estimate eepage area - measure or latercress - estimate total stutlet (tile or other) - record file eaver dam - measure per lanmade dam - measure per la lanmade dam - measur	Other: Comments Ongoing and No Evidence ATA KEY: pring/upwelling - estimate < 0.5 l/sec or > 0 eepage area - measure or estimate length //atercress - estimate total surface area occ putlet (tile or other) - record flow status as possiblet (tile or other) - record flow status as possiblet (tile or other) - record flow status as possiblet (tile or other) - record flow status as possiblet (tile or other) - record flow status as possiblet (tile or other) - record flow status as possiblet (tile or other) - record flow status as possiblet (tile or other) - record flow status as possiblet (tile or other) - record flow status as possible (tile or other) - record flow status as possible (tile or other) - record flow status as possible (tile or other) - record flow status as possible (tile or other) - record flow status as possible (tile or other) - record flow status as possible (tile or other) - record flow status as possible (tile or other) - record flow status as possible (tile or other) - record flow status as possible (tile or other) - record flow status as possible (tile or other) - record flow status as possible (tile or other) - record flow status as possible (tile or other) - record flow status as possible (tile or other) - record flow status as possible (tile or other) - record flow status as possible (tile or other) - record flow status as possible (tile or other) - record flow status as possible (tile or other) - record flow status as possible (tile or other) - record flow status as possible (tile or other) - record flow status as possible (tile or other) - record flow status as possible (tile or other) - record flow status as possible (tile or other) - record flow status as possible (tile or other) - record flow status as possible (tile or other) - record flow status as possible (tile or other) - record flow status as possible (tile or other) - record flow status as possible (tile or other) - record flow status as possible (tile or other) - record flow status as possible (tile or other) - record flow sta

Date: May ST	12021	Proje	ct#: 16041	0325	Recorder/Crew:	J. March	
Stream Name:			m Code:		Site Code:	SMD-UC	3-A
Site Limits:	Upstream Downstream	WP# WP#			Field Assessmen	Sample 2	Unconnected HDF: Not connected
Direction of Assessment: Flow Influence		☐ Upst	ream	Downstream	1- (0)	□ Sample 3	to downstream network
now influence	☐ Freshel	(1)		☐ Spa	te (2)	Base	flow (3)
Flow Condition	Dry (1) Standin	g Water (2)			rstitial Flow (3) mal Flow (4)	☐ Subs	tantial Flow (5)
Feature Type		Natural Char elized or Cons read (3)			Defined Feature (4) I Feature (5) land (6)	☐ Swale ☐ Road ☐ Pond	Iside Ditch (8)
Feature Vegetation	□ None (1) [Cropped (3)		dow (4) Scrub		6) D Forest (7)
0 - 1.5 m Left Bank Right Bank		Lawn (2) Lawn (2)	☐ Cropped (3) ☐ Cropped (3)	□Meado □ Mea	and the second second		
1.5 - 10 m Left Bank Right Bank	Section 19 11 and 19 19	□ Lawn (2) □ Lawn (8)	Cropped (3)		The state of the s		1.0
10 - 30 m Left Bank Right Bank	the state of the s	☐ Lawn (2) ☐ Lawn (2)	Cropped (3)		dow (4) Scrub		
Distance (m):			eter (2) Lac Elevation (co	ser Level (3)	Survey Level (4	Other (5) Gradient	LiDAR (6) (%):
Distance (m): Dominant Substrate (S Sub-Dominant Substra	2.M3) [dard Pan)	_ Elevation (ci	m):_		Gradient	(%):
Dominant Substrate (S Sub-Dominant Substra Feature Roughness Width Measurement	2.M3) [te (S2.M3) [10% Minimal re (1)	Elevation (co	.06-2 mm) .06-2 mm) .06-2 mm) .06-2 mm) .06-2 mm) .07 .08 .09 .09 .09 .09 .09 .09 .09	Gravel (22-66 mm)	Gradient (Cobble (67-249 mm) B	(%):
Dominant Substrate (S Sub-Dominant Substra Feature Roughness Width Measurement Channel Dimensions	2.M3) [te (S2.M3)	10% Minimal re (1)	Elevation (co	.06-2 mm) .06-2 mm) .06-2 mm) .06-2 mm) .06-2 mm) .07 .08 .09 .09 .09 .09 .09 .09 .09	Gravel (22-66 mm) e (2)	Gradient (Cobble (67-249 mm) B	Soulder (250 mm) Bedrock
Dominant Substrate (S Sub-Dominant Substra Feature Roughness Width Measurement Channel Dimensions	2.M3) [te (S2.M3) Can't Measu Feature Width (m	10% Minimal re (1)	Elevation (co	m): .06-2 mm) .06-2 mm) .06-2 mm) .06-2 mm) .06-2 mm) .07 .08 .09 .09 .09 .09 .09 .09 .09 .09 .09 .09	Gravel (22-66 mm) e (2)	Gradient (Cobble (67-249 mm) B 0% High (3)	louider (250 mm) Bedrock

Date: _									
				PO	NT FEAT	URE DATA			
Fish Ba	rrier Measuren			Perched Height		Jumping He			
		WP#		Perched Height		Jumping He			
Ground	water Indicate	ors \square	None	Watercress	☐ Seepage	Bubbling	☐ Stained	Other:	
ish Co	llection		Absent	Present	Comment:				
WP#	Photo#	Code	Category			1	Description		
				+					
				-					
a = 4 ;									
			1						
Addit	ional Notes		V. ~	70 ga	· .				
Site B	reak 🔲	Feature Typ	e 🗆 Fe	ature Modifier	Flow C	Conditions [Feature Veg	etation 🔲 Rip	parian Vegetation
Additi	reak 🗆		e 🗆 Fe	ature Modifier	Flow C	Conditions C		etation	
Site Br	reak 🔲 r 🔲 Data	Feature Typ	e Fennments	ature Modifier	Flow C				
Site Br Trigge Point I Catego	reak 🔲 r 🔲 Data	Feature Typ	e Fennments	ature Modifier	Flow C	c Evidence (2)			

	1000/50	Project#: \Co	410925	Recorder/Crew:	3 Marsell	
Stream Name:		Stream Code:		Site Code:	5MD - WC	1 - A
Site Limits:	Downstream V	VP# VP#		Field Assessment:	☐ Sample 1 ☐ Sample 2	Unconnected HDF;
Direction of Assessment		Upstream	☐ Downstream		☐ Sample 3	to downstream networ
Flow Influence	☐ Freshet (1)		☐ Spate	e (2)	■ Basefi	low (3)
Flow Condition	Dry (1) Standing W	ater (2)		stitial Flow (3) nat Flow (4)	☐ Substa	antial Flow (5)
Feature Type	☐ Defined Na☐ Channelize	tural Channel (1) d or Constrained (2)	☐ No Do	efined Feature (4) Feature (5)		ide Ditch (8)
Feature Vegetation	☐ Multi-thread		U Wetla	and (6) flow (4) Scrubland	D Pond (
1		ин (2) — оторре	id (5) H Wedu	ow (4) La Scrubiani	a (5) www. welland(6)	Forest (7)
Riparian Vegetation 0 - 1.5 m Left Bank Right Bank	None (1) Law	rn (2)		(4) Scrubland (5 low (4) Scrubland	4.	□Forest (7) □ Forest (7)
1.5 - 10 m Left Bank Right Bank	□ None (1) □ L □ None (1) □ L			low (4) Scrubland low (4) Scrubland		
10 - 30 m Left Bank Right Bank	□ None (1) □ L □ None (1) □ L	awn (2) Croppe		low (4) Scrubland		
Dominant Substrate (S Sub-Dominant Substra		Pan) Silt Sa	nd (0.06-8 mm) G	ravel (22-66 mm) Co	bble (67-249 mm) Bo	ulder (250 mm) Bedrock
eature Roughness Vidth Measurement	Can't Measure (1)		10 - 40% Moderate Mean Wid	ith (3) DEstimated	High (3)	0% Extreme (4) Measure/GIS (6)
Channel Dimensions	Feature Width (m):	7		ankfull Depth (mm)		
intrenchment To	tal:	< 40 m Left Ba	nkm	Right Bank	m Total w	ridthm
urface Flow Method	Perched Culvert (1) \square Hyc	draulic Head (2)	☐ Distance by Tir	me (3)	Estimated (4)
Marra Juniaria (m)	Wetted Depth (m	m) Hydraulic he 3 1 2		Volume (L) 2 3	Distance (m) 1 2 3	Time (s)
Wetted Width (m)						
	Adjacent 🖪 No	one (1)	(2) 🔲 Rill an	d Gully (3)	Gully (4) 🔲 Ou	tlet Scour (5)

Date:		Proje		d Headwater Drainage Fo		Pg. 2 of 2 Sample # 2 Sample # 3
				POINT FEATURE DA		
3round	rrier Measurer water Indicate	wP#		Height (mm): Jumpin Height (mm): Jumpin	ng Height (mm); ng Height (mm);	Other:
WP#	Photo #	Code	Category		Description	
ddit	ional Notes	: + N	o Waler o	Hrosport		
ite Br	-	Feature Type Other: Com		fier	☐ Feature Vegetation	Riparian Vegetation
Point I	Data	Out of	Ongoing and Active (1) No Evidence (4)		(2) Reported but No Ev	idence (3)
A B C D E F G H	Seepage area Watercress - (Outlet (tile or of Inlet (tile or of Beaver dam - Manmade dar Other barrier I Potential conti	i - measure or estimate total solher) - record ther) - record flor measure perconnum - measure per of fish movement amination sour ening - indicate type, size and	ow status as per feature flow hed height and jumping he perched height and jumping ent to (storm sewer outlet or it and by rip-rap, armour stone whether or not perched. If	here seepage occurs flow. Estimate volume <0.5 l/sec or > ow. Estimate volume to be <0.5 l/sec eight height industrial discharge pipe).	or >0.5 l/sec.	re.

Date: May 2	1202/	Projec	# \GO410	325	Recorder/Crew		
Stream Name:			m Code:		Site Code:	SMO wa	1-0
Site Limits:	Upstream Downstream	WP# WP#			Field Assessment:	Sample 1 Sample 2	Unconnected HDF:
Direction of Assessment:		■ Upstr	eam 🔲 D	ownstream		☐ Sample 3	to downstream networ
low Influence	☐ Freshe	t (1)		☐ Spate	(2)	M Base	eflow (3)
Flow Condition	Dry (1)	ng Water (2)			itial Flow (3) al Flow (4)	☐ Subs	stantial Flow (5)
Feature Type	☐ Define	d Natural Chan elized or Const			fined Feature (4) eature (5)	☐ Swal	dside Ditch (8)
Feature Vegetation	☐ None (1)		☐ Cropped (3)		w (4) Scrublar		6)
0 - 1.5 m Left Bank Right Bank		JLawn (2) Lawn (2)	□ Cropped (3) □ Cropped (3)	□Meadow □ Meado	A A CONTRACTOR OF THE PARTY OF		
1.5 - 10 m Left Bank Right Bank	☐ None (1) ☐ None (1)	□ Lawn (2) □ Lawn (2)	☐ Cropped (3) ☐ Cropped (3)	☐ Meado	ow (4) Scrublan		
10 - 30 m Left Bank Right Bank	Comment of the commen	☐ Lawn (2)	Cropped (3) Cropped (3)		ow (4) Scrubla	and the second s	
Distance (m):		_	Elevation (cm		Survey Level (4)	Other (5)	LiDAR (6)
Dominant Substrate (S	(2.M3)	Hard Pan)	Elevation (cm	<u> </u>			(%):
Dominant Substrate (S Sub-Dominant Substra Feature Roughness Width Measurement	ite (S2.M3) Can't Measu	10% Minimal ure (1)	Silt Sand (0.0	06-2 mm) Gr	(2) 40 - 60° th (3) Estimate	Gradient (67-249 mm)	(%): Boulder (250 mm) Bedroc
Dominant Substrate (S Sub-Dominant Substra Feature Roughness Width Measurement Channel Dimensions	nte (S2.M3)	10% Minimal ure (1)	Elevation (oxp	106-2 mm) Gr	ravel (22-66 mm) C	Gradient Cobble (67-249 mm) Gradient Gradient Gradient Gradient Gradient Gradient	(%): Boulder (250 mm) Bedroc
Dominant Substrate (S Sub-Dominant Substrate Feature Roughness Width Measurement Channel Dimensions	ite (S2.M3) Can't Measure Feature Width (m	10% Minimal (are (1)	Elevation (oxp	10% Moderate Mean Widt Ba m Head (2)	(2) 40 - 60% th (3) Estimate ankfull Depth (mm)	Gradient Cobble (67-249 mm) Whigh (3) GlS (5) Marked (4) GlS (5)	Boulder (250 mm) Bedroc Boulder (250 mm) Bedroc Comparison of the comparison of th

Date:		Proje	Uncons			_	ure Assessmen 3 Sample #1	t Sample#2	Pg. 2 of 2 Sample # 3
				PC	DINT FEAT	IRE DATA			
Ground	rrier Measuren water Indicato	wP#	None 🔲	Perched Heig Perched Heig Watercress Present	ht (mm) ht (mm)	Jumping He Jumping He Bubbling	eight (mm): eight (mm):	Other:	
WP#	Photo #	Code	Category			4	Description		
Addit	ional Notes	* /	Have S	ols V	LEOUSTRAT		☐ Feature Vegetatio		rian Vegetation
Trigge Point	r D	Other: Cor		1.11		Evidence (2)	Reported but No		ian vegetation
Categ			No Evidence (4	200			Tioponed during	Evidence (e)	
ABCDEFGHIJKLMZOP	Seepage area Watercress - Outlet (tile or Inlet (tile or of Beaver dam - Manmade dar Other barrier Potential cont Channel hard Culvert - note Flow transition Flow transition Flow transition	a - measure of estimate total other) - record ther) - record ther) - record ther) - record ther) - record there are a measure per a manination south of the size and a point D/S - fin point M/S- fin point D-S/IF of during non-finent source	flow status as per fi ched height and ju- perched height and pent urce (storm sewer ted by rip-rap, arm d whether or not per low condition chan- low condition chan-	f bank where pied r feature flow. E eature flow. E mping height I jumping height outlet or indus our stone, or erched. If per ges from dry ges from dry ges from do	seepage occurs Estimate volume <0 Estimate volume to b thit Strial discharge pipe) gabion baskets. ched record perched to standing water, in mal to substantial su	e <0.5 l/sec or >0 height and jump dependent of se	oing height.	eak	

Date: May 27	1000/	Projec	# 16041	UBD5	Recorder/Cre	w: 5	Marel	\
Stream Name:		Stream	Code:		Site Code:	51	10-mc	5-3
Site Limits:	Upstream Downstream	WP# WP#			Field Assess	The second second	Sample 1 Sample 2	Unconnected HDF: Not connected
Direction of Assessment:		Upstre	am 🗆 D	ownstream			Sample 3	to downstream network
Flow Influence	☐ Freshet (1)		☐ Spate	3 (2)		Basefle	ow (3)
Flow Condition	Dry (1) Standing	Water (2)			stitial Flow (3) nal Flow (4)		☐ Substa	antial Flow (5)
eature Type	☐ Defined N		el (1)		efined Feature (4)	☐ Swale	(7)
1	☐ Channeli		ained (2)		Feature (5)		☐ Roadsi	
Feature Vegetation	Multi-thre		Connect (2)	☐ Wetla	and (6) fow (4) D So	nibland (E)	Pond (9	9)
Riparian Vegetation	□ None (1) □	Lawii (2)	☐ Cropped (3)	LI Mead	10W (4) LJ 50	rubiano (5)	☐ Wetland(6)	Li Folest(r)
0-1.5 m Left Bank Right Bank	1	awn (2) Lawn (2)	☐ Cropped (3) ☐ Cropped (3)	☐ Meadov			□Wetland (6) □ Wetland (6)	□ Forest (7) □ Forest (7)
1.5 - 10 m Left Bank Right Bank	□ None (1) □ □ None (1) □	Lawn (2) Lawn (2)	☐ Cropped (3)☐ Cropped (3)		dow (4) So dow (4) So		☐ Wetland (6) ☐ Wetland (6)	C. C
0 - 30 m Left Bank Right Bank		Lawn (2)	☐ Cropped (3) ☐ Cropped (3)		dow (4)		☐ Wetland (6) ☐ Wetland (6)	
Distance (m):		VB. V	Elevation (cm)				Gradient (%	
			Silt Sand (0.0	6-2 mm) (Gravel (22-66 mr	n) Cobble (6	7-249 mm) Boi]]	ulder (250 mm) Bedrock
Dominant Substrate (Si Sub-Dominant Substrate Feature Roughness	2.M3)	0% Minimal (1) 10-4	0% Moderate	1 do	- 60% High (3) 🗆 > 6	50% Extreme (4)
Sub-Dominant Substra	2.M3)	0% Minimal (1 (1)) 10-4	3	1 do	Î	3) 🗆 > 6	
Sub-Dominant Substrative Roughness Width Measurement	2.M3)	0% Minimal (1 (1)) 10-4 Bankfull (2)	0% Moderate Mean Wi	1 do	1 - 60% High (3 stimated (4)	3) 🗆 > 6	50% Extreme (4)
Sub-Dominant Substrates Feature Roughness Width Measurement Channel Dimensions	2.M3)	0% Minimal (1 (1)) 10-4 Bankfull (2)	0% Moderate Mean Wi	1/2	1 - 60% High (3 stimated (4)	3)	50% Extreme (4)
Sub-Dominant Substrates Feature Roughness Width Measurement Channel Dimensions Entrenchment To	2.M3) te (S2.M3) Can't Measure Feature Width (m): tal: > 40 m	0% Minimal (1 (1)) 10-4 Bankfull (2)	0% Moderate Mean Wi	dth (3) = Es	- 60% High (3 stimated (4)]	50% Extreme (4) Measure/GIS (6)
Sub-Dominant Substrate Roughness Width Measurement Channel Dimensions	2.M3)	0% Minimal (1 (1))	0% Moderate Mean Wi Head (2)	Bankfull Depth (n Right Bank Distance Volume (L)	ee by Time (3)	GIS (5) Total v	50% Extreme (4) Measure/GIS (6)

Date: _		Proje	Uncon		leadwater Di	rainage Feat Assessment:		-	Pg, 2 of 2
				P	DINT FEAT	URE DATA	A		
Ground	rrier Measuren water Indicato	wP#		Perched Heig Perched Heig Watercress Present	50.00		eight (mm): eight (mm): Stained	Other:	
WP#	Photo#	Code	Category				Description		
Addit	ional Notes		* No	Wete.	7				
Site B	-	Feature Typ	nments	ture Modifier			☐ Feature Veg		rian Vegetation
Point I Catego			Ongoing and No Evidence			ic Evidence (2) own (5)	Reported bu	t No Evidence (3)	
POINT ABCDEFGHIJKLMN	Spring/upwell Seepage area Watercress - Outlet (tile or ol Beaver dam - Manmade da Other barrier Potential cont Channel hard Culvert - note Flow transitio Flow transitio	a - measure of estimate total other) - record ther) - record ther) - record to measure per indicative, size and point D/S - fin point M/S- fill during non-fit	<0.5 l/sec or >0. r estimate length surface area occ d flow status as per ched height and jourched height ar ent urce (storm sewe ted by rip-rap, and d whether or not low condition cha ow condition cha	5 l/sec; measure flow feature flow feature flow fumping height or outlet or indumour stone, or perched. If peanges from dryinges from minimages from of thanges from of the football of the fo	seepage occurs Estimate volume Estimate volume to ght strial discharge pig	be <0.5 l/sec or > be). ed height and jumindependent of sesurface flow, inde	ping height. egment break pendent of segme	int break	

Date: Not 2	12001	Proje	ct# \(\ac\4\c	305	Recorder/Crew	3. Marsel	1
Stream Name:	1	Strea	im Code:		Site Code:	5MO-WO	A &
Site Limits:	Upstream Downstream	WP# WP#			Field Assessmen	t: Sample 1	Unconnected HDF:
Direction of Assessment		☐ Upstr	eam 📓 D	Downstream		☐ Sample 3	to downstream network
low Influence	☐ Fresh	net (1)		☐ Spate	(2)	■ Base	eflow (3)
Flow Condition	Dry (1	1) ding Water (2)		☐ Intersti	itial Flow (3) al Flow (4)	☐ Subs	stantial Flow (5)
eature Type	☐ Defin	ed Natural Chan			fined Feature (4)	☐ Swa	le (7)
1		inelized or Const	rained (2)	☐ Tiled F			dside Ditch (8)
English Von Aus		-thread (3)		☐ Wetlan		□ Pond	
Feature Vegetation	☐ None (1)	Lawn (2)	☐ Cropped (3)	☐ Meado	ow (4) Scrubi	and (5) 🔲 Wetland((6) Forest (7)
0 - 1.5 m Left Bank Right Bank	□ None (1) □ None (1)	□ Lawn (2) □ Lawn (2)	☐Cropped (3) ☐ Cropped (3)	☐ Meadow ☐ Meado	1.6		
1.5 - 10 m Left Bank Right Bank	☐ None(1) ☐ None (1)	Lawn (2) Lawn (2)	☐ Cropped (3)☐ Cropped (3)		ow (4) Scrubl	and the second second	
10 - 30 m Left Bank Right Bank	☐ None (1) ☐ None (1)	□ Lawn (2) □ Lawn (2)	☐ Cropped (3) ☐ Cropped (3)	☐ Meado	ow (4) Scrubi		
Channel Gradient (S4.I Distance (m):		(1) Clinome	_ Elevation (cm	n):	Survey Level (4	Gradient	
	Clay	(Hard Pan)	_ Elevation (cm	n):		Gradient	(%):
Distance (m): Dominant Substrate (S	Clay 2.M3) te (S2.M3)	(Hard Pan)	Elevation (cm	n):	ravel (22-66 mm)	Gradient Cobble (67-249 mm)	
Distance (m): Dominant Substrate (S Sub-Dominant Substra Feature Roughness	Clay 2.M3) te (S2.M3)	(Hard Pan)	Elevation (cm	06-2 mm) Gr	ravel (22-66 mm)	Gradient Cobble (67-249 mm) E	Boulder (250 mm) Bedrock
Distance (m): Dominant Substrate (S Sub-Dominant Substra Feature Roughness Width Measurement	Clay 2.M3) te (S2.M3) Can't Meas Feature Width ((Hard Pan) (Hard Pan) < 10% Minimal sure (1)	Elevation (cm	06-2 mm) Gr 06-2 mm) Gr 09-2 mm] Gr 09-2 m	ravel (22-66 mm)	Gradient Cobble (67-249 mm) E	30ulder (250 mm) Bedrock
Distance (m): Dominant Substrate (S Sub-Dominant Substra Feature Roughness Width Measurement Channel Dimensions	Clay 2.M3) te (S2.M3) Can't Meas	(Hard Pan) (Hard Pan) < 10% Minimal sure (1)	Elevation (cm	06-2 mm) Gr 06-2 mm) Gr 40% Moderate Mean Widt	ravel (22-66 mm)	Gradient Cobble (67-249 mm) E	30ulder (250 mm) Bedrock
Distance (m): Dominant Substrate (S Sub-Dominant Substra Feature Roughness Width Measurement Channel Dimensions Entrenchment To	Clay 2.M3) te (S2.M3) Can't Meas Feature Width ((Hard Pan) < 10% Minimal sure (1) m): m	Elevation (cm	06-2 mm) Gr 06-2 mm) Gr 40% Moderate Mean Widt	ravel (22-66 mm) (2)	Gradient Cobble (67-249 mm) E	Boulder (250 mm) Bedrock Boulder (250 mm) Bedrock
Distance (m): Dominant Substrate (S Sub-Dominant Substra Feature Roughness Width Measurement Channel Dimensions	Clay 2.M3) te (S2.M3) Can't Meas Feature Width (in the late) Can't Meas	(Hard Pan) < 10% Minimal sure (1) m): m	Elevation (cm	1): Gr 106-2 mm) Gr 100% Moderate of the moderate of	ravel (22-66 mm) (2) 40 - 60 th (3) Estima ankfull Depth (rgm)	Gradient Cobble (67-249 mm) E	Boulder (250 mm) Bedrock Boulder (250 mm) Bedrock
Distance (m): Dominant Substrate (S Sub-Dominant Substrate (S Sub-Dominant Substrate (S Sub-Dominant Substrate (S Sub-Dominant Substrate (S Surface Flow Method)	Clay 2.M3) te (S2.M3) Can't Meas Feature Width (intal: > 40) Perched Co	(Hard Pan) < 10% Minimal sure (1) m): m	Elevation (cm	Mean Widt Head (2)	ravel (22-66 mm) (2)	Gradient Cobble (67-249 mm) E	Boulder (250 mm) Bedrock Boulder (250 mm) Bedrock Boulder (250 mm) Bedrock Boulder (250 mm) Bedrock Measure (4) Measure/GIS (6)
Distance (m): Dominant Substrate (S Sub-Dominant Substrate (S Sub-Dominant Substrate (S Sub-Dominant Substrate (S Sub-Dominant Substrate Roughness Width Measurement Channel Dimensions Entrenchment To Surface Flow Method Wetted Width (m)	Clay 2.M3) te (S2.M3) Can't Meas Feature Width (intal: > 40) Perched County Wetted De	(Hard Pan) < 10% Minimal sure (1) m): m	Elevation (cm	1):	ravel (22-66 mm) (2)	Gradient Cobble (67-249 mm) E	Boulder (250 mm) Bedrock Boulder (250 mm) Bedrock Boulder (250 mm) Bedrock Boulder (4) Boulder (4) Measure/GIS (6) Widthm Estimated (4) Time (s)
Distance (m): Dominant Substrate (S Sub-Dominant Substrate (S Sub-Dominant Substrate (S Sub-Dominant Substrate (S Sub-Dominant Substrate (S Surface Flow Method)	Clay 2.M3) te (S2.M3) Can't Meas Feature Width (introduced Company) Perched Company Wetted December 1 2 Adjacent Feature	(Hard Pan) < 10% Minimal sure (1) m): m	Elevation (cm Silt Sand (0.0) (1)	1):	ravel (22-66 mm) (2)	Gradient Cobble (67-249 mm) E	Boulder (250 mm) Bedrock Boulder (250 mm) Bedrock Boulder (250 mm) Bedrock Boulder (4) Measure/GIS (6) Width m Estimated (4) Time (s) 3 1 2 3

Date:		Proje	Uncons		eadwater Drair Field Ass		ture Assessr		mple # 2	Pg. 2 of 2 Sample # 3
				PC	INT FEATU	RE DATA	A	_		
Ground	arrier Measurer water Indicate	wp#	None	Perched Heigh	nt (mm): ht (mm):	Jumping H	eight (mm): eight (mm):	Oth	ner:	
WP#	Photo #	Code	Category				Description			
Addit	ional Notes	: /v	+4.c 5	0/000 44 Elio	rosos.					
Site B		Feature Typ Other: Con		ure Modifier	☐ Flow Con	ditions [☐ Feature Veg	etation	Ripar	ian Vegetation
Point Categ	Data		Ongoing and A No Evidence (vidence (2) (5)	Reported bu	t No Evide	ence (3)	
POINT ABCDEFGH	Seepage area Watercress - Outlet (tile or Inlet (tile or of Beaver dam - Manmade dar	a - measure or estimate total other) - record ther) - record fi measure pero	ow status as per hed height and ju erched height an ent	of bank where upied or feature flow. feature flow. E umping height d jumping heigh	seepage occurs Estimate volume <0.6 stimate volume to be ht strial discharge pipe).	1/sec or >0.5 <0.5 1/sec or >	Vsec. Measure ter 0.5 Vsec.	mperature		

Date:	27/2021	Projec	ci#: \Cocyi	UB25	Recorder/Crew.	J. Morsel	/
Stream Name:			m Code:		Site Code:	SMO-WC	
Site Limits:	Upstream	WP#			Field Assessment:	☐ Sample 1	Unconnected HDF:
Direction of Assessme	Downstream nt:	WP# Upstr	eam 📓 D	ownstream		Sample 2 Sample 3	□ Not connected to downstream networ
Flow Influence	☐ Fres		3411	☐ Spate (2)	Baseft	
Flow Condition	■ Dry	2.10		☐ Interstit	tial Flow (3)		antial Flow (5)
Feature Type	☐ Defi	ined Natural Chan unnelized or Const ti-thread (3)			ined Feature (4) eature (5)	☐ Swale ☐ Roads ☐ Pond (ide Ditch (8)
Feature Vegetation		☐ Lawn (2)	Cropped (3)	☐ Meado) 🗆 Forest (7)
Riparian Vegetation 0 - 1.5 m Left Bank Right Ban		□ Lawn (2) □ Lawn (2)	□Cropped (3) □ Cropped (3)	□Meadow (A comment of the comm	□ Forest (7) □ Forest (7)
1.5 - 10 m Left Bank Right Ban			☐ Cropped (3) ☐ Cropped (3)	the second of th	w (4) Scrubland w (4) Scrubland		
10 - 30 m Left Bank Right Ban		The second second second second	☐ Cropped (3) ☐ Cropped (3)		w (4) Scrubland		
		y (Hard Pan)	Silt Sand (0.0	6-2 mm) Gr	avel (22-66 mm) Co	hblo (67 240 mm) . Do	ulder IAEA mm) Deducel
Dominant Substrate Sub-Dominant Subst	(S2.M3)					Doi: (07-243 mm) B0	D D
	(S2.M3) trate (S2.M3) Can't Me	☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐	(1) 10-4	10% Moderate (: Mean Width	2) 40 - 60%	High (3)	
Sub-Dominant Subst Feature Roughness Width Measurement Channel Dimensions	(S2.M3) trate (S2.M3) Can't Mea		(1)	10% Moderate (2 Mean Width	2)	High (3) > 1 (4) GIS (5)	60% Extreme (4)
Sub-Dominant Subst Feature Roughness Width Measurement Channel Dimensions	(S2.M3) trate (S2.M3) Can't Me: Feature Width Total: 240		(1)	10% Moderate (: Mean Width Bai	2)	High (3)	60% Extreme (4) Measure/GIS (6)
Sub-Dominant Subst Feature Roughness Width Measurement Channel Dimensions Entrenchment	trate (S2.M3) Can't Mea Feature Width Total: 24((1)	10% Moderate (2)	2)	High (3)	60% Extreme (4) Measure/GIS (6) width m Estimated (4)

Date:		Proje		strained Headwater Drainage Feature Assessment Pg. 2 of 2 Field Assessment: Sample # 1 Sample # 2 Sample # 3
7				POINT FEATURE DATA
Ground	orrier Measuren Newster Indicate	WP#		Perched Height (mm): Perched Height (mm). Sumping Height (mm): Jumping Height (mm): Watercress Seepage Bubbling Stained Other: Present Comment:
WP#	Photo #	Code	Category	Description
Addit		Feature Typ	e Fea	はre Modifier
Trigge Point Categ	Data	Other: Con	Ongoing and No Evidence	Active (1) Historic Evidence (2) Reported but No Evidence (3)
POINT ABCOEFGHIJKLMN	Seepage area Watercress - 0 Outlet (tile or of Inlet (tile or of Beaver dam - Manmade dar Other barrier t Potential conti- Channel harde Culvert - note Flow transition	a - measure or estimate total other) - record her) - record measure pero m - measure pero of fish movem- amination sou ening - indicate type, size and point D/S - fil	estimate length surface area occ I flow status as per ched height and j erched height are ent roce (storm sewer ed by rip-rap, arr i whether or not low condition cha	er feature flow. Estimate volume <0.5 l/sec or >0.5 l/sec. Measure temperature. rfeature flow. Estimate volume to be <0.5 l/sec or >0.5 l/sec.

Date: Mais	1000/1	Pr	oject#:	16041	ceso	Rec	corder/Crew;	7	M	/lx	
Stream Name:	1,1-3-1		ream Cod		00		Code		10-W		
Site Limits:	Upstream Downstream	WP#	-				d Assessmen		Sample 1 Sample 2	Unconn	ected HDF:
Direction of Assessment:		NO U	ostream		Downstr	eam			Sample 3	to dow	nstream netw
Flow Influence	☐ Fresh	at (1)				Spate (2)			Base	eflow (3)	
Flow Condition	Dry (1) ing Water (2)				Interstitial Florida			☐ Sub	stantial Flow	(5)
Feature Type	☐ Define	ed Natural Ch nelized or Co	nannel (1)			No Defined Tiled Featur	Feature (4)		☐ Swa	ile (7) dside Ditch (8)
	☐ Multi-			75.91		Wetland (6)			☐ Pon		1
Feature Vegetation Riparian Vegetation	☐ None (1)	☐ Lawn (2		Cropped (3)		Meadow (4)	☐ Scrubla	and (5)	☐ Wetland	(6) 🗆 For	rest (7)
0 - 1.5 m Left Bank Right Bank	1	□ Lawn (2)		Cropped (3) Cropped (3)		Meadow (4)	☐ Scrubland		□ Wetland (6)		orest (7) Forest (7)
1.5 - 10 m Left Bank Right Bank		☐ Lawn (2 ☐ Lawn (2		Cropped (3) Cropped (3)			☐ Scrubia		☐ Wetland ☐ Wetland		Forest (7)
10 - 30 m Left Bank	☐ None (1)	Lawn (2		Cropped (3)	ΤП.	Meadow (4)	☐ Scrubla	and (5)	☐ Wetland	(6)	Forest (7)
Right Bank Channel Gradient (S4.) Distance (m):	☐ None (1)	Lawe (2) [Cropped (3)	Ger Level	Meadow (4)	Scruble	and (5)	☐ Wetland Other (5) Gradient		Forest (7) LiDAR (6)
Right Bank Channel Gradient (S4.)	□ None (1) W7) □ Visual Clay (2.M3)	□ rame (5) [Cropped (3) Las Elevation (cm	Ger Level	Meadow (4)	Scrubla	and (5)	Other (5) Gradient	1 (%):	T. 1. mar. 27 - 27
Right Bank Channel Gradient (S4.) Distance (m): Dominant Substrate (S Sub-Dominant Substra Feature Roughness	None (1) Visual Clay (2.M3) te (S2.M3)	(1) Clind (Hard Pan) (Hard Pan) (Hard Pan)	Sitt	Cropped (3) Las Elevation (cm	ser Level	Meadow (4)	Scrubla	Cobble (6 E	Other (5) Gradient 7-249 mm)	Boulder (250	LiDAR (6) mm) Bedroome (4)
Right Bank Channel Gradient (S4.) Distance (m): Dominant Substrate (S Sub-Dominant Substrate Feature Roughness Width Measurement Channel Dimensions	None (1) None (1) Visual Clay (2.M3) te (S2.M3) Can't Meas Feature Width (r	(1) Clind (Hard Pan)	Silt	Cropped (3) Las Elevation (cm Sand (0.0)	ser Level	Meadow (4) (3) Su (3) Su (4) (3) Su (5) (6) (7) (7) (8) (8) (9) (9) (9) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10) (10)	Scruble rvey Level (4) 22-66 mm) 40 - 60 Estima Depth (mm)	Cobble (6 E	Other (5) Gradient 7-249 mm) Gradient Gradient Gradient	Boulder (250	me (4)
Right Bank Channel Gradient (S4.) Distance (m): Dominant Substrate (S Sub-Dominant Substra Feature Roughness Width Measurement Channel Dimensions Entrenchment To	None (1) Visual Clay (2.M3) te (S2.M3) Can't Meas Feature Width (rotal: > 40 rotal:	Hard Pan) < 10% Minimure (1) n	Sitt	Cropped (3) Las Elevation (cm Sand (0.6) Las Left Bank Left Bank	Ger Level n): 06-2 mm 40% Mo	Meadow (4) (3) Su (3) Su (4) (3) Su (5) Gravel (2) an Width (3) Bankfull m Rigi	Scruble 22-66 mm) 40 - 60 Estima Depth (mm)	Cobble (6 E E C C C C C C C C C C C C C C C C C	Other (5) Gradient 7-249 mm) GIS (5) Tota	Boulder (250 Boulder (250) Boulder (250) Boulder (250) Measure	me (4)
Right Bank Channel Gradient (S4.) Distance (m): Dominant Substrate (S Sub-Dominant Substra Feature Roughness Width Measurement Channel Dimensions	None (1) None (1) Visual Clay (2.M3) te (S2.M3) Can't Meas Feature Width (r	Lawn (2 (1)	Silt	Cropped (3) Las Elevation (cm Sand (0.0)	Ger Level n): 06-2 mm 40% Mo	Meadow (4) (3) Su (3) Su (3) Su (4) (5) Su (6) Su (7) Su (7) Su (8) Su (9) S	Scruble 22-66 mm) 240 - 60 Estima Depth (mm) ht Bank Distance by	Cobble (6 E E K High (3) ted (4)	Other (5) Gradient 7-249 mm) GIS (5) Tota	Boulder (250 Boulder (250) Solution (250) Measure Weasure Weasure	me (4)

Date:		Proje	Unconstraine	d Headwater Dra			nt Sample#2	Pg. 2 of 2 Sample # 3
		110,0		POINT FEATU			- oumpor a	
Ground	mer Measurer	WP#		Height (mm): Height (mm):	Jumping I	Height (mm): Height (mm):	Other	
WP#	Photo#	Code	Category			Description		
Site B	_	Feature Typ				☐ Feature Vegeta	tion 🗖 Ripar	ian Vegetation
Trigge Point Categ	Data	Other: Con	onments Ongoing and Active (1 No Evidence (4)) Historic Unknow	Evidence (2) m (5)	Reported but No	Evidence (3)	
POINT	DATA KEY:		<0.5 l/sec or >0.5 l/sec; m					

Date: May S	1000/50	Proje	ct#: \Cc	41095	5 Rec	order/Crew	J. Mas	119
Stream Name:			m Code:	11000		Code	SMD-W	
Site Limits:	Upstream Downstream	WP#			Flek	d Assessment	Sample 1 Sample 2	Unconnected HDF:
Direction of Assessment		■ Upstr	eam	☐ Downstre	am		☐ Sample 3	to downstream networ
low Influence	☐ Freshe	et (1)			Spate (2)		Bas	eflow (3)
Flow Condition	Dry (1)) ng Water (2)			Interstitial Flo		☐ Sub	estantial Flow (5)
nature Type		d Natural Chan			No Defined F		☐ Swa	
	☐ Chann	nelized or Const	rained (2)		Tiled Feature Wetland (6)	e (5)	☐ Roa	idside Ditch (8)
Feature Vegetation	☐ None (1)		☐ Croppe			☐ Scrubland		(6) Forest (7)
Riparian Vegetation								
0 - 1.5 m Left Bank Right Bank	1	□ Lawn (2) □ Lawn (2)	□ Cropped (Water Control	eadow (4) Meadow (4)	☐ Scrubland (5		
1.5 - 10 m Left Bank Right Bank	☐ None (1) ☐ None (1)	Lawn (2)	☐ Croppe		Meadow (4) Meadow (4)	☐ Scrubland		
10 - 30 m Left Bank Right Bank	The second secon	□ Lawn (2) □ Lawn (2)	☐ Croppe		Meadow (4) Meadow (4)			
Channel Gradient (S4. Distance (m):		(1) Clinome	1	Laser Level	(3) \(\subseteq \subseteq \u00e4	rvey Level (4)	Other (5) Gradien	L(%):
Distance (m): Dominant Substrate (S	Clay (Hard Pan)	Elevation				Gradien	
Distance (m): Dominant Substrate (S	Clay (52.M3) ate (\$2.M3)	Hard Pan)	Elevation Sail Sail	on (cm) :) Gravel (22-66 mm) Co	Gradien bble (67-249 mm)	8 (%): Boulder (250 mm) Bedrock
Distance (m): Dominant Substrate (S Sub-Dominant Substrate Feature Roughness	Clay (52.M3) ate (\$2.M3)	Hard Pan) Compared to the second sec	Elevation Sail Sail	on (cm) ::) Gravel (22-66 mm) Co	Gradien bble (67-249 mm)	8 (%): Boulder (250 mm) Bedrock
Distance (m): Dominant Substrate (S Sub-Dominant Substrate Feature Roughness Width Measurement	Clay (52.M3) ate (\$2.M3)	Hard Pan) O < 10% Minimal ure (1)	Elevation Said	on (cm) ::	Gravel (22-66 mm) Co	Gradien bble (67-249 mm)	Boulder (250 mm) Bedrock
Distance (m): Dominant Substrate (\$ Sub-Dominant Substrate Feature Roughness Width Measurement Channel Dimensions	Clay (s2.M3) ate (S2.M3) Can't Meas	Hard Pan) 100 Minimal oure (1)	Silt Sai	on (cm) ::	Gravel (22-66 mm) Co	Gradien bble (67-249 mm) High (3) GIS (5)	Boulder (250 mm) Bedrock
Distance (m): Dominant Substrate (\$ Sub-Dominant Substrate Feature Roughness Width Measurement Channel Dimensions Entrenchment	Clay (s2.M3) ate (S2.M3) Can't Meas Feature Width (notal: > 40 m	Hard Pan) < 10% Minimal vire (1) n): - 40	Silt Sal (1) Bankfull (2)	on (cm) ::	gravel (: derate (2) an Width (3) Bankfull m Righ	22-66 mm) Co 22-66 mm) Co 22-66 mm) Co Estimated Depth (mm)	Gradien bble (67-249 mm) High (3) GIS (5) Tota	t (%): Boulder (250 mm) Bedrock
Distance (m): Dominant Substrate (S Sub-Dominant Substrate Feature Roughness Width Measurement Channel Dimensions Entrenchment T Surface Flow Method	Clay (62.M3) ate (\$2.M3) Can't Meas Feature Width (n	Hard Pan) 10% Minimal vire (1) 10% Minimal vire (1) 10% Minimal	Silt Sal (1) Bankfull (2)	on (cm) ::nd (0.96-2 mm	derale (2) Bankfull m Rigt	22-66 mm) Co 22-66 mm) Co 22-66 mm) Co Estimated Depth (mnt) nt Bank Distance by Ti	Gradien bble (67-249 mm) High (3) GIS (5) GIS (3) GIS (5)	t (%): Boulder (250 mm) Bedrock Boulder (250 mm) Bedrock Solve Extreme (4) Measure/GIS (6) Weasure/GIS (6) Estimated (4)
Distance (m): Dominant Substrate (\$ Sub-Dominant Substrate Feature Roughness Width Measurement Channel Dimensions Entrenchment	Clay (s2.M3) ate (s2.M3) Can't Meas Feature Width (notal: > 40 m	Hard Pan) < 10% Minimal ure (1) n): a 40 oth (mm)	Elevation Silt Said (1) Bankfull (2) M Left Ba	on (cm) ::nd (0.06-2 mm)	gravel (: derate (2) an Width (3) Bankfull m Righ	22-66 mm) Co 22-66 mm) Co 22-66 mm) Co Estimated Depth (mnt) nt Bank Distance by Ti	Gradien bble (67-249 mm) High (3) GIS (5) Tota	### 1 (%): Boulder (250 mm) Bedrock
Distance (m): Dominant Substrate (S Sub-Dominant Substrate Feature Roughness Width Measurement Channel Dimensions Entrenchment T Surface Flow Method	Clay (52.M3) ate (S2.M3) Can't Meas Feature Width (notal: > 40 m Perchad Cu Wetted Dep 1 2 Adjacent Feature	Hard Pan) < 10% Minimal vure (1) n): an	Elevation Silt Said (1)	on (cm)	derate (2) an Width (3) Bankfull m Right Volum 1 Rill and Gull Instream Ba Rill and Gull	22-66 mm) Co 22-66 mm) Co 22-66 mm) Co 20-60% Estimated Depth (mnt) at Bank Distance by Ti e (L) 2 3 y (3) nk Erosion (7)	Gradien bble (67-249 mm) High (3) 1 (4) GIS (5) Tota me (3) Distance (m) 1 2 Gully (4)	Boulder (250 mm) Bedroc Boulder (250 mm) Bedroc 60% Extreme (4) Measure/GIS (6) Widthm Estimated (4) Time (s)

Date:	27130	DI Proje		eadwater Drainage Feature Assessment Pg 2 of 2 Field Assessment: Sample # 1 Sample # 2 Sample # 3
-				INT FEATURE DATA
Ground	rrier Measurer water Indicate	WP#	Perched Height Perched Height	
WP#	Photo #	Code	Category	Description
Addit	ional Notes			
			+ No Ho	6
Site B		Feature Typ		☐ Flow Conditions ☐ Feature Vegetation ☐ Riparian Vegetation
Point	Data		Ongoing and Active (1) No Evidence (4)	Historic Evidence (2) Reported but No Evidence (3) Unknown (5)
POINT A B C D E F G H J K M N D D	Seepage area Watercress - Outlet (tile or Inlet (tile or of Beaver dam - Manmade dai Other barrier Potential cont Channel hard Culvert - note Flow transition Flow transition	a - measure or estimate total other) - record for measure per manation south of the measure manation south of the measure manation south of the measure measure of the mea	flow status as per feature flow. Est ched height and jumping height perched height and jumping height ent urce (storm sewer outlet or industrated by rip-rap, armour stone, or gad d whether or not perched. If perchallow condition changes from dry to low condition changes from minim	eepage occurs Estimate volume <0.5 l/sec or >0.5 l/sec. Measure temperature, timate volume to be <0.5 l/sec or >0.5 l/sec. It discharge pipe).

Date: July Bo	1000/	Project #	160410	325 R	ecorder/Crew	J. Masel	
Stream Name:		Stream			te Code:	5MD-W	3-A
Site Limits:	Upstream	WP#	-	Fi	eld Assessment	☐ Sample 1	Unconnected HDF:
		WP#				☐ Sample 2	☐ Not connected
Direction of Assessment:		Upstream	m D	ownstream		Sample 3	to downstream network
low Influence	☐ Freshet (1)		☐ Spate (2)		■ Base	flow (3)
low Condition	Dry (1) Standing V	Water (2)		☐ Interstitial ☐ Minimal Fl		☐ Subs	tantial Flow (5)
eature Type	☐ Defined No. ☐ Channelize	atural Channel ed or Constrain	4 4	☐ No Define ☐ Tiled Feat	ure (5)		side Ditch (8)
	☐ Multi-threa			☐ Wetland (6		Pond	
eature Vegetation	□ None (1) □	Lawn (2)	Cropped (3)	☐ Meadow (4) 🗆 Scrublan	d (5) U Wetland(6	3)
Riparian Vegetation							
0-1.5 m Left Bank Right Bank	The second secon	1	☐ Cropped (3)	☐ Meadow (4) ☐ Meadow (Scrubland (
.5 - 10 m Left Bank Right Bank			Cropped (3)	☐ Meadow (
0 - 30 m Left Bank Right Bank			☐ Cropped (3) ☐ Cropped (3)		4) Scrubland		
Channel Gradient (S4.M Distance (m):	M7)	Clinometer	(2) Lase	1	Survey Level (4)	Other (5) Gradient (LiDAR (6)
	Clay (Hard	d Pan) S		6-2 mm) Grave		Gradient ((%):
Distance (m): Dominant Substrate (S. Sub-Dominant Substra	Clay (Harr 2.M3)	d Pan) S	Elevation (cm)	6-2 mm) Grave	(22-66 mm) Cc	Gradient (bble (67-249 mm) B	oulder (250 mm) Bedrock
Distance (m): Dominant Substrate (Si Sub-Dominant Substrate Feature Roughness	Clay (Harr 2.M3)	d Pan) S	Elevation (cm) Silt Sand (0.0	6-2 mm) Grave	1 (22-66 mm) Co	Gradient (bble (67-249 mm) B	oulder (250 mm) Bedrock
Distance (m): Dominant Substrate (S. Sub-Dominant Substrate (S. Sub-Domina	Clay (Hard 2.M3)	d Pan) S	Elevation (cm)	6-2 mm) Grave 0% Moderate (2) Mean Width (3	1 (22-66 mm) Co	Gradient (sbble (67-249 mm) B	oulder (250 mm) Bedrock
Distance (m): Dominant Substrate (S. Sub-Dominant Substrate (S. Substrate (S	Clay (Hard 2.M3)	d Pan) S	Elevation (cm)	6-2 mm) Grave 0% Moderate (2) Mean Width (3	1 (22-66 mm) Co	Gradient (bble (67-249 mm) B High (3)	oulder (250 mm) Bedrock
Distance (m): Dominant Substrate (Significant Substrate (Significan	Clay (Hard 2.M3) te (S2.M3) Can't Measure (Feature Width (m):	d Pan) S 0% Minimal (1) (1)	Elevation (cm) Silt Sand (0.0	6-2 mm) Grave 0% Moderate (2) Mean Width (3 Bankfi	1 (22-66 mm) Co	Gradient (bble (67-249 mm) B High (3)	oulder (250 mm) Bedrock Graph Graph Graph Graph Bedrock Bedrock Graph B
Distance (m): Dominant Substrate (S. Sub-Dominant Substrate (S. Substrate (Clay (Hard 2.M3) te (\$2.M3) Can't Measure (Feature Width (m): otal: > 40 m	d Pan) S 0% Minimal (1) (1)	Elevation (cm) Silt Sand (0.0	6-2 mm) Grave 0% Moderate (2) Mean Width (3 Bankfi m Ri Head (2)	1 (22-66 mm) Co	Gradient (bble (67-249 mm) B High (3)	oulder (250 mm) Bedrock

Date:		Proje	Unconstra				ture Assessme	ent Sample#	Pg_2 of 2 2 Sample # 3
				PC	INT FEAT	URE DAT	Α		
Ground	rrier Measuren water Indicato	WP#	Per	ched Heigh ched Heigh tercress	et (mm):	Jumping I	Height (mm): Height (mm):	Other:	
WP#	Photo #	Code	Category				Description		
Additi	onal Notes		No wa	YET_					
	-		1						
Site Br Trigge	_	Feature Typ		Modifier	☐ Flow 0	Conditions	Feature Vegeta	ation 🗆 R	iparian Vegetation
Point I	Data		Ongoing and Acti No Evidence (4)			c Evidence (2) wn (5)	Reported but N	lo Evidence (3	3)
A B C C D E F G H L J K L M V D	Seepage area Watercress - Outlet (file or of linet (file or of linet) Beaver dam - Manmade dar Other barrier is Potential cont Channel hard Culvert - note Flow transition Flow transition	a - measure or estimate total solther) - record fineasure percon - measure percon fish movement amination sour ening - Indicate type, size and a point D/S - floor point D/S - floor during non-fish	ow status as per feathed height and jumperched height and jumpert and jumperched height and jumperched to the form sewer out ed by rip-rap, armould whether or not percow condition changeoux changeoux condition changeoux condition changeoux change	ank where s d ature flow. ure flow. Es ing height mping heigh let or indust stone, or g hed. If perc s from dry to from mininges from dry	seepage occurs Estimate volume stimate volume to nt trial discharge piptabion baskets, hed record perche to standing water, and to substantial	be <0.5 l/sec or e). d height and jun independent of s surface flow, indi	nping height.	break	

ate: July 9	12021	Project	# 1604100	25	Recorder	/Crew:	J. Marsell	
tream Name;	- (Code:		Site Code	ė;	540- WC	(-A
ite Limits:	Upstream Downstream	WP# WP#			Field Ass	essment:	☐ Sample 1 ☐ Sample 2	Unconnected HDF: Not connected
Direction of Assessment		Upstre	am 🗆 D	ownstream			Sample 3	to downstream networ
low Influence	☐ Freshe	t (1)		☐ Spa	ite (2)		■ Base	flow (3)
low Condition	Dry (1)	ng Water (2)			rstitial Flow (3))	☐ Subs	tantial Flow (5)
eature Type	☐ Define	1 Natural Chann elized or Constra read (3)			Defined Featu d Feature (5) tland (6)	re (4)	☐ Swale ☐ Road ☐ Pond	side Ditch (8)
eature Vegetation	□ None (1)	☐ Lawn (2)	☐ Cropped (3)	☐ Mea	adow (4)	Scrubland (5) 🔲 Wetland(6	B) ☐ Forest (7)
) - 1.5 m Left Bank Right Bank	March 1 Control of the Control of th	Dawn (2) □ Lawn (2)	□Cropped (3) □ Cropped (3)	□ Meado		crubland (5) Scrubland (☐Wetland (6)	☐Forest (7) ☐ Forest (7)
1.5 - 10 m Left Bank Right Bank		☐ Lawn (2)☐ Lawn (2)☐	Cropped (3) Cropped (3)	☐ Mea	444	A Principle of the Paris of the	A STATE OF THE PARTY OF THE PAR	
10 - 30 m Left Bank Right Bank		☐ Lawn (2) ☐ Lawn (2)	☐ Cropped (3)		adow (4)	Scrubland (Scrubland (
Distance (m): Dominant Substrate (Sub-Dominant Substr	S2.M3)	Hard Pan)	Silt Sand (0.0		Gravel (\$2-66	imm) Cobb	Gradient on Gradie	oulder (250 mm) Bedrock
Feature Roughness Width Measurement Channel Dimensions	Can't Measu			0% Modera Mean V		40 - 60% H Estimated (7	60% Extreme (4) Measure/GIS (6)
Entrenchment T	otal: D > 40 m	□ < 40 n	Left Bank		m Right Bar	nk	m Total	widthm
Surface Flow Method Wetted Width (m)	Perched Cu Wetted Dep	th (mm) 3	Hydraulic head (m 1 2	m)	Dis Volume (L) 2		e (3) E Distance (m) 1 2	
Sediment Transport	Feature	None (1) Sheet Erosio None (1) Sheet Erosio	on (6)	☐ Inst	and Gully (3) ream Bank Er and Gully (3) ream Bank Er	osion (7)	Gully (4)	Outlet Scour (5) Other (8) Outlet Scour (5) Other (8)

ate:	2713	121 200		strained Headwater Drainage Feature Assessment Pg. 2 of 2 Field Assessment: Sample # 1 Sample # 2 Sample # 3
ale.	201 3	S/2/ Proje	C(#:	Meid Assessment. — dampie in 1
round	rier Measuren water Indicato llection	WP#	None	POINT FEATURE DATA Perched Height (mm): Perched Height (mm): Jumping Height (mm): Jumping Height (mm): Watercress Seepage Bubbling Stained Other: Present Comment:
WP#	Photo#	Code	Category	Description
				* No H20 observed + Hydric soils + regelation throughout
ddit	ional Notes			
Site B	_	Feature Typ		ure Modifier
rigge Point Category	Data		Ongoing and A	
POINT A B C D E	Seepage area Watercress - 6 Outlet (tile or of	r - measure or estimate total other) - record her) - record f measure per	estimate length of surface area occu I flow status as per low status as per shed height and ju	er feature flow. Estimate volume <0.5 l/sec or >0.5 l/sec. Measure temperature. feature flow. Estimate volume to be <0.5 l/sec or >0.5 l/sec.

	0/2021 Pro	ect#. \CoH\c	595 Rer	corder/Crew	J. Morsel	1
tream Name:		eam Code:		e Code.	540-W	
lite Limits:	Upstream WP# Downstream WP#			ld Assessment	☐ Sample 1 ☐ Sample 2	Unconnected HDF Not connected
Direction of Assessment Flow Influence		stream LI Do	ownstream		Sample 3 Base	to downstream networ
low influence	☐ Freshet (1)		☐ Spate (2)		in base	110W (3)
Flow Condition	Dry (1) Standing Water (2)		☐ Interstitial Flor		Subs	tantial Flow (5)
eature Type	☐ Defined Natural Ch: ☐ Channelized or Cor ☐ Multi-thread (3)	The state of the s	☐ No Defined☐ Tiled Featur☐ Wetland (6)	re (5)	☐ Swale ☐ Road ☐ Pond	side Ditch (8)
Feature Vegetation	None (1) Lawn (2)	Cropped (3)	☐ Meadow (4)	☐ Scrubland	(5) Wetland(6	5) D Forest (7)
Riparian Vegetation 1 - 1.5 m Left Bank Right Bank	□ None (1) □ Lawn (2) □ None (1) □ Lawn (2)	☐ Cropped (3) ☐ Cropped (3)	☐ Meadow (4) ☐ Meadow (4)	Scrubland (5)	11.11	☐ Forest (7) 6) ☐ Forest (7)
1.5 - 10 m Left Bank Right Bank	□ None (1) □ Lawn (2) □ None (1) □ Lawn (2)		☐ Meadow (4) ☐ Meadow (4)			
10 - 30 m Left Bank Right Bank	□ None (1) □ Lawn (2) □ None (1) □ Lawn (2)			☐ Scrubland ☐ Scrubland		
Dominant Substrate (S Sub-Dominant Substra		Silt Sand (0.06	Gravei (22-66 mm) Cob 	Die (67-249 mm) Bi	oulder (250 mm) Bedrock
Feature Roughness Width Measurement	Can't Measure (1)	_)% Moderate (2) Mean Width (3)	40 - 60% H		60% Extreme (4) Measure/GIS (6)
Channel Dimensions	Feature Width (m):	0 m Left Bank	Bankfull m Righ	Depth (mm)	m Total	width m
Intrenchment To	14.111				1	
	Премы 0 мини (п)	Modernika U	land (O)	Distance by Ton	- (2)	75-5-1-176
Surface Flow Method	Perched Culvert (1)	Hydraulic H		Distance by Tim		Estimated (4)
Entrenchment To Surface Flow Method Wetted Width (m)	Perched Culvert (1) Wetted Depth (mm) 1 2 3	Hydraulic H Hydraulic head (mm 1 2	n) Volum		Distance (m)	Time (s)
Surface Flow Method Wetted Width (m)	Wetted Depth (mm) 1 2 3	Hydraulic head (mm 1 2	n) Volum	ne (L) 2 3	Distance (m)	Time (s)

ate:	2773	△\ Proje		strained Headwater Drainage Feature Assessment Pg 2 of 2 HICODS Field Assessment: Sample # 1 Sample # 2 Sample # 3
- 10	25.4			POINT FEATURE DATA
Ground	rrier Measuren water Indicato	wp#	None	Perched Height (mm) Perched Height (mm) Watercress Seepage Bubbling Stained Other Present Comment
WP#	Photo#	Code	Category	Description
	ional Notes	: Feature Typ	* HA	ture Modifier Flow Conditions Feature Vegetation Riparian Vegetation
rigg	er 🗆 Data	Other: Cor	nments	
POINT A B C D E F G	Seepage area Watercress - Outlet (tile or Inlet (tile or of Beaver dam -	a - measure or estimate total other) - record ther) - record f measure per	r estimate length of surface area occi of flow status as per flow status as per ched height and ju	per feature flow. Estimate volume <0.5 l/sec or >0.5 l/sec. Measure temperature or feature flow. Estimate volume to be <0.5 l/sec or >0.5 l/sec.

- 7014	1000/08	Projec	d#: Yacki	0995	Recorder/Cre	1 3	Monsel	\
Stream Name:	777	Stream	m Code:		Site Code:	5	MO-WC	3-8
ite Limits:	Upstream Downstream	WP# WP#			Field Assessn		Sample 1 Sample 2	Unconnected HDF: Not connected
Direction of Assessment		■ Upstr	eam 🗆	Downstream		1	Sample 3	to downstream networ
low Influence	☐ Freshe	at (1)		☐ Spa	te (2)		Basef)	ow (3)
low Condition	Dry (1) ing Water (2)			rstitial Flow (3) imal Flow (4)		☐ Substa	ential Flow (5)
eature Type		ed Natural Channelized or Consti thread (3)			Defined Feature (4 d Feature (5) land (6)		☐ Swale ☐ Roads ☐ Pond (ide Ditch (8)
eature Vegetation	None (1)		Cropped (3)		adow (4) Scr	ubland (5)		☐ Forest (7)
- 1.5 m Left Bank Right Bank		□ Lawn (2)	□Cropped (3) □ Cropped (3)	☐Meado	and the second second	and (5) I ubland (5)	□ Wetland (6)	☐Forest (7) ☐ Forest (7)
.5 - 10 m Left Bank Right Bank		Lawn (2)	☐ Cropped (3)☐ Cropped (3)				☐ Wetland (6	
0 - 30 m Left Bank Right Bank		☐ Lawn (2) ☐ Lawn (2)	☐ Cropped (3)		adow (4) Scr adow (4) Scr		☐ Wetland (6	
Distance (m):		(Hard Pan)		0.06-2 mm)	Gravel (22-66 mm	Cobble (6	Gradient (* 7-249 mm) Bo	ulder (250 mm) Bedrock
Sub-Dominant Substra	te (S2.M3)	< 10% Minimal (- 40% Modera	te (2) 40	60% High (3 mated (4)		50% Extreme (4) 1 Measure/GIS (6)
eature Roughness Vidth Measurement	Can't Meas	< 10% Minimal (ure (1)	(1) 10 Bankfull (2)	- 40% Modera	te (2) 40 lidth (3) Est Bankfull Depth (m	mated (4)	☐ GIS (5) ☐	60% Extreme (4) 1 Measure/GIS (6)
Sub-Dominant Substrates eature Roughness Vidth Measurement Channel Dimensions Entrenchment To	Can't Meas Feature Width (rotal: > 40 r	< 10% Minimal (pure (1)	(1) 10 Bankfull (2)	- 40% Modera	te (2) 40 lidth (3) Est Bankfull Depth (m m Right Bank	mated (4)	m Total v	60% Extreme (4) 1 Measure/GIS (6) widthm
Dominant Substrate (S: Sub-Dominant Substrat Feature Roughness Width Measurement Channel Dimensions Entrenchment To Surface Flow Method	Can't Meas Feature Width (rotal: > 40 r	< 10% Minimal (sure (1)	(1)	- 40% Modera Mean W	te (2) 40 lidth (3) Est Bankfull Depth (m	mated (4)	m Total v	60% Extreme (4) 1 Measure/GIS (6)
Sub-Dominant Substrates eature Roughness Vidth Measurement Channel Dimensions Entrenchment To	Can't Meas Feature Width (rotal: > 40 r	< 10% Minimal (pure (1)	(1) 10 Bankfull (2)	- 40% Modera Mean W	te (2) 40 lidth (3) Est Bankfull Depth (m m Right Bank	mated (4)	m Total v	1 Measure/GIS (6)

Date:	243	2) Proje	d#: \6041			eature Assessment Sample # 1 S	Pg. 2 of 2 ample # 2 Sample # 3
					EATURE DA		
Ground	rner Measurer water Indicate	WP#	Perch	d Height (mm): d Height (mm): ress	Jumpin Jumpin age 🔲 Bubblin	ng Height (mm): ng Height (mm); ng Stained C	ither
WP#	Photo #	Code	Category			Description	
Additi	onal Notes	F	4 4	HOO	s + vege	Leher.	
Site Br	_	Feature Typ	e Feature M	difier 🔲	Flow Conditions	☐ Feature Vegetation	☐ Riparian Vegetation
Point I	Data	J. 101.	Ongoing and Active No Evidence (4)		Historic Evidence Unknown (5)	(2) Reported but No Evi	dence (3)
ABCDEFGHLJK	Seepage area Watercress - Outlet (tile or Inlet (tile or ot Beaver dam - Manmade dar Other barrier Potential cont Channel hard Culvert - note Flow transition	e - measure or estimate total: other) - record her) - record measure pero n - measure pero of fish movem- amination sou ening - indicat type, size and n point D/S - fi	low status as per feature thed height and jumping erched height and jump ent roe (storm sewer outlet ed by rip-rap, armour st if whether or not perche- ow condition changes fir	where seepage oc re flow. Estimate volu- flow. Estimate volu- height ng height or industrial dischar- one, or gabion bask of perched record om dry to standing of m minimal to subst	olume <0.5 l/sec or a ime to be <0.5 l/sec ge pipe). ets. perched height and water, independent antial surface flow,	jumping height.	

Date: July Sc	1000/	Proje	d#: 160410	50.05	Recorder/Crew	3 Marsel	1
Stream Name:			m Code:	0.65	Site Code	5MD-1	
Site Limits:	Upstream Downstream	WP# WP#			Field Assessment	☐ Sample 2	Unconnected HDF Not connected
Direction of Assessment		☐ Upstr	eam 🔳 [Downstream		Sample 3	to downstream networ
low Influence	☐ Freshe	1(1)		☐ Spate	(2)	■ Base	eflow (3)
Flow Condition	■ Dry (1) □ Standir	ng Water (2)		☐ Interst	itial Flow (3) al Flow (4)	☐ Subs	stantial Flow (5)
Feature Type		d Natural Chan elized or Const pread (3)	The state of the s	☐ No De☐ Tiled F☐ Wetlar		☐ Swal ☐ Road ☐ Pond	dside Ditch (8)
Feature Vegetation	□ None (1)	☐ Lawn (2)	Cropped (3)	☐ Meado	ow (4) Scrubla	and (5) Wetland(6)
0 - 1.5 m Left Bank Right Bank		Skawn (2) Dawn (2)	□ Cropped (3)	☐ Meadow ☐ Meado	(4) Scrubland	7.6	the state of the s
1.5 - 10 m Left Bank Right Bank		☐ Lawn (2) ☐ Lawn (2)	Cropped (3) Cropped (3)	☐ Meado		A STATE OF THE PARTY OF THE PAR	
10 - 30 m Left Bank Right Bank	1000	☐ Lawn (2) ☐ Lawn (2)	☐ Cropped (3) ☐ Cropped (3)		ow (4) Scrubla		
Distance (m):	-		Elevation (cm	1:1	_	Gradient	(%):
Dominant Substrate (S	2.M3) [Hard Pan)	Silt Sand (0.0	1	avel (22-66 mm) C	Gradient Cobble (67-249 mm) B	
Dominant Substrate (S Sub-Dominant Substrate Feature Rougnness	2.M3) [te (S2.M3) [10% Minimal (Silt Sand (0.0	06-2 mm) G	(2) 40 60	Cobble (67-249 mm) B	Soulder (250 mm) Bedrock
Dominant Substrate (S Sub-Dominant Substra Feature Rouginess Width Measurement	2.M3) [te (S2.M3)	10% Minimal (rre (1)	Silt Sand (0.0	06-2 mm) On	(2) 40 60	Cobble (67-249 mm) B	Soulder (250 mm) Bedrock
Dominant Substrate (S. Sub-Dominant Substrate (S. Sub-Dominant Substrate Substrate Rouginess Width Measurement Channel Dimensions	2.M3) [te (S2.M3)	10% Minimal (ire (1)	Silt Sand (0.0	06-2 mm) On	(2) 40 60° th (3) Estimat	Cobble (67-249 mm) B	Soulder (250 mm) Bedrock
Dominant Substrate (S. Sub-Dominant Substrate (S. Substrate (S	2.M3) [te (S2.M3)	10% Minimal (me (1)	Silt Sand (0.0	06-2 mm) On	(2) 40 60° th (3) Estimate ankfull Depth (mm)	Cobble (67-249 mm) B	Soulder (250 mm) Bedrock Graph Control Graph Cont
Dominant Substrate (S: Sub-Dominant Substrate Feature Rouginess Width Measurement Channel Dimensions Entrenchment To	2.M3) [te (S2.M3)	10% Minimal (pre (1)	Silt Sand (0.0	06-2 mm) On	(2) 40 60° th (3) Estimate ankfull Depth (mm) Right Bank	Cobble (67-249 mm) B	Soulder (250 mm) Bedrock 60% Extreme (4) Measure/GIS (6) widthm

	2430	DI Proje	a#: \6041	Sample # 3 Sample # 2 Sample # 3 Sample # 3
				POINT FEATURE DATA
round	rrier Measuren water Indicato	wP#	None W	erched Height (mm): Jumping Height (mm) erched Height (mm) Jumping Height (mm) Vatercress Seepage Bubbling Stained Other resent Comment:
WP#	Photo #	Code	Category	Description
ddit	ional Notes		* No.	HOO downed
ite B				
		Feature Typ		re Modifier
Trigge Point Categ	er 🔲 Data	Feature Typ Other: Con		ctive (1) Historic Evidence (2) Reported but No Evidence (3)

ASIGJOH .X	12021	Project#: \Co4\c	335 Recorder/Crew	J Marsell
Stream Name:		Stream Code:	Site Code:	540-WC2-AB
Site Limits:	Upstream WP	#	Field Assessmen	☐ Sample 2 ☐ Not connected
Direction of Assessment:		Upstream D I	Downstream	Sample 3 to downstream network
low influence	☐ Freshet (1)		☐ Spate (2)	Baseflow (3)
low Condition	■ Dry (1)□ Standing Water	er (2)	☐ Interstitial Flow (3) ☐ Minimal Flow (4)	☐ Substantial Flow (5)
eature Type	☐ Defined Natura ☐ Channelized o ☐ Multi-thread (3	r Constrained (2)	☐ No Defined Feature (4) ☐ Tiled Feature (5) ☐ Wetland (6)	 ☐ Swale (7) ☐ Roadside Ditch (8) ☐ Pond (9)
eature Vegetation	□ Noge (1) □ Law	n (2) Cropped (3)	☐ Meadow (4) ☐ Scrubla	and (5) Wetland(6) Forest (7)
Riparian Vegetation 0 - 1.5 m Left Bank Right Bank	□None (1) □Lawn		☐ Meadow (4) ☐ Scrubland	
1,5 - 10 m Left Bank Right Bank	☐ None (1) ☐ Law ☐ None (1) ☐ Law		☐ Meadow (4) ☐ Scrubla ☐ Meadow (4) ☐ Scrubla	
10 - 30 m Left Bank Right Bank	☐ None (1) ☐ Law		☐ Meadow (4) ☐ Scrubta ☐ Meadow (4) ☐ Scrubta	
Distance (m):	Olev (Hand De	Elevation (cn		☐ Other (5) ☐ LIDAR (6). — Gradient (%):
Dominant Substrate (S2				
Distance (m): Dominant Substrate (S2 Sub-Dominant Substrat Feature Roughness Width Measurement	2.M3)	n) Silt Sand (0.	06-2 mm) Gravel (22-66 mm) (Gradient (%): Cobble (67-249 mm) Boulder (250 mm) Bedrock
Dominant Substrate (SZ Sub-Dominant Substrat Feature Roughness Width Measurement	2.M3)	n) Silt Sand (0.1	06-2 mm) Gravel (22-66 mm) (Gradient (%): Cobble (67-249 mm) Boulder (250 mm) Bedrock
Dominant Substrate (SZ Sub-Dominant Substrate Feature Roughness Width Measurement Channel Dimensions	2.M3)	n) Silt Sand (0.1	06-2 mm) Gravel (22-66 mm) (06-2 mm) Gravel	Gradient (%): Cobble (67-249 mm) Boulder (250 mm) Bedrock
Dominant Substrate (S. Sub-Dominant Substrate Substrate Roughness Width Measurement Channel Dimensions	2.M3)	n) Silt Sand (0.1	06-2 mm) Gravel (22-66 mm) (06-2 mm) Gravel (22-66 mm) (40% Moderate (2)	Gradient (%): Cobble (67-249 mm) Boulder (250 mm) Bedrock Gradient (%): Cobble (67-249 mm) Boulder (250 mm) Bedrock High (3)
Dominant Substrate (S2 Sub-Dominant Substrate Feature Roughness Width Measurement Channel Dimensions Entrenchment To Surface Flow Method Wetted Width (m)	2.M3)	n) Silt Sand (0.1	O6-2 mm) Gravel (22-66 mm) (40% Moderate (2)	Gradient (%): Cobble (67-249 mm) Boulder (250 mm) Bedrock Gradient (%): Cobble (67-249 mm) Boulder (250 mm) Bedrock High (3)
Dominant Substrate (S. Sub-Dominant Substrate Sub-Dominant Substrate Feature Roughness Width Measurement Channel Dimensions Entrenchment To Surface Flow Method	2.M3)	n) Silt Sand (0.1	O6-2 mm) Gravel (22-66 mm) (40% Moderate (2)	Gradient (%): Cobble (67-249 mm) Boulder (250 mm) Bedrock
Dominant Substrate (SZ Sub-Dominant Substrate Feature Roughness Width Measurement Channel Dimensions Entrenchment To Surface Flow Method Wetted Width (m)	Adjacent Non	inimal (1)	O6-2 mm) Gravel (22-66 mm) (10	Gradient (%): Cobble (67-249 mm) Boulder (250 mm) Bedrock High (3)

		3						☐ Sample # 2	Sample # 3
ich Ra	rrier Measuren	nents: WP#		Perched Height		URE DAT	Height (mm)		
ian Da	nici measuren	WP#			1	Jumping 1			
round	water Indicate	, D			A COLOR		Stained	Domer	
	llection			Present		- Budbing	— Starred	Outst	
			377-10-	1. 1005(1)	Comment				
WP#	Photo#	Code	Catagoni				Description		
****	FIIOIO#	Code	Category				Description		
			-						
-									
Site B	_	Feature Typ		ture Modifier	Flow	Conditions	☐ Feature Veg	etation	parian Vegetation
Trigge		Other: Cor		A - 6: 741	Ulata	da Fuldania (0)	Deported by	I No Cuidonos (2)	
Point I			Ongoing and No Evidence			ric Evidence (2) own (5)	Reported bu	I No Evidence (3)	
Catego	DATA KEY:		NO EVIDENCE	(4)	Ulki	OWIT (3)			
H (Seepage are: Watercress - Outlet (tile or Inlet (tile or of Beaver dam - Manmade dan Other barrier Potential cont Channel hard Culvert - note Flow transitio	a - measure or estimate total other) - record ther) - record measure per m - measure p to fish movem amination sou ening - indica type, size and n point D/S - f	flow status as per ched height and jourched height ar nent urce (storm sewer ted by rip-rap, and d whether or not low condition cha- low condition cha-	of bank where so cupied her feature flow. Es umping height and jumping height routlet or industration mour stone, or greeperched. If perchanges from dry to anges from minim	eepage occurs Estimate volume to timate volume tima	pe). ned height and jui, independent of I surface flow, inc	mping height.	ent break	

Date: July 3	1606/6	Projec	# \GU4\G	305	Recorder/Crew	J. Marel	1
Stream Name:	7,000		m Code	2000	Site Code:	540-W	
Site Limits:	Upstream	WP#			Field Assessment:	☐ Sample 1	Unconnected HDF
	Downstream	WP#				☐ Sample 2	□ Not connected
irection of Assessment		■ Upstre	eam 🔲 Dr	ownstream		Sample 3	to downstream netwo
low Influence	☐ Fresh	et (1)		☐ Spate	(2)	■ Base	flow (3)
low Condition	Dry (1) ing Water (2)		☐ Intersti	itial Flow (3)	☐ Subsi	stantial Flow (5)
eature Type	☐ Define	ed Natural Chanr nelized or Constr			fined Feature (4) feature (5)	Swale Road Pond	Iside Ditch (8)
eature Vegetation		☐ Lawn (2)	Cropped (3)		w (4) Scrublan		6) Forest (7)
liparian Vegetation	1						
-1.5 m Left Bank Right Bank	Committee of the Commit	Lawn (2) Lawn (2)	Cropped (3) Cropped (3)	☐ Meadow ((4) Scrubland (
.5 - 10 m Left Bank Right Bank		☐ Lawn (2) ☐ Lawn (2)	Cropped (3)		ow (4) Scrublan		
0 - 30 m Left Bank	☐ None (1)	T (7		w (4) Scrublan	d (5) Wetland ((6) D Forest (7)
Right Bank Channel Gradient (S4.I Distance (m):	☐ None (1)	☐ Lawn (2) ☐ Lawn (2) (1) ☐ Clinome	Cropped (3) Cropped (3) eter (2) Elevation (cm)	Meado	w (4) Scrubian Survey Level (4)		(6)
Right Bank Channel Gradient (S4.I Distance (m): Dominant Substrate (S	None (1) M7) Visual Clay (52.M3)	☐ Lawn (2)	cter (2) Lase	Meado	Survey Level (4)	d (5) Wetland (Other (5) Gradient	(6)
Right Bank Channel Gradient (S4.I Distance (m): Dominant Substrate (S Sub-Dominant Substra	None (1) M7) Visual Clay (52.M3) ate (S2.M3)	Lawn (2) (1) Clinome (Hard Pan)	Elevation (cm)	Meado ar Level (3)	Survey Level (4) Survey Level (4) avel (22-66 mm) Co	Other (5) Gradient (b) Obble (67-249 mm) B	(%):
Right Bank Channel Gradient (S4.1 Distance (m): Dominant Substrate (S Sub-Dominant Substrate Feature Roughness	None (1) M7) Visual Clay (52.M3) ate (\$2.M3)	Lawn (2) (1) Clinome (Hard Pan) < 10% Minimal (Cropped (3) eter (2)	Meado	avel (22-66 mm) Co	d (5) Wetland (Other (5) Gradient (Obble (67-249 mm) B	(%): Forest (7)
Right Bank Channel Gradient (S4.I Distance (m): Dominant Substrate (S Sub-Dominant Substrate Feature Roughness Vidth Measurement	None (1) M7) Visual Clay (52.M3) ate (\$2.M3)	(1) Clinome (Hard Pan)	Cropped (3) eter (2)	Meado ar Level (3) 06-2 mm) Gr	avel (22-66 mm) Co	d (5) Wetland (Other (5) Gradient (Obble (67-249 mm) B	(%):
Right Bank Channel Gradient (S4.I Distance (m): Dominant Substrate (S Sub-Dominant Substrate Feature Roughness Vidth Measurement Channel Dimensions	None (1) M7) Visual Clay (32.M3) ate (\$2.M3)	Lawn (2) (1) Clinome (Hard Pan)	Cropped (3) eter (2)	Meado ar Level (3) 06-2 mm) Gr. 00% Moderate (Mean Widt	Survey Level (4) avel (22-66 mm) Co 2)	d (5)	(%):
Right Bank Channel Gradient (S4.1 Distance (m): Dominant Substrate (S Sub-Dominant Substrate Feature Roughness Width Measurement Channel Dimensions Entrenchment To	None (1) M7) Visual Clay (32.M3) ate (\$2.M3) Can't Meas Feature Width (rotal: > 40 rotal: > 40 rotal	Lawn (2)	Cropped (3) eter (2)	Meado ar Level (3) 06-2 mm) Gr. 00% Moderate (Mean Widt	Survey Level (4) Survey Level (4) avel (22-66 mm) Co (2)	d (5)	Go Forest (7) LiDAR (6) (%): Soulder (250 mm) Bedroc Go Extreme (4) Measure/GIS (6) widthm
Right Bank Channel Gradient (S4.1 Distance (m): Dominant Substrate (S Sub-Dominant Substrate Feature Roughness Width Measurement Channel Dimensions Entrenchment To Surface Flow Method	None (1) M7) Visual Clay (\$2.M3) ate (\$2.M3) Can't Meas Feature Width (r otal: > 40 r	Lawn (2)	Cropped (3) eter (2)	Meado ar Level (3) O6-2 mm) Grace MoModerate (Mean Widt Ba m Head (2)	Survey Level (4) avel (22-66 mm) Co 2)	Other (5) Gradient (5) Gradient (5) Gradient (67-249 mm) B Gradient (67-249 mm) B Gradient (67-249 mm) B Gradient (67-249 mm) B Gradient (67-249 mm) Gradient	Go Forest (7) LiDAR (6) (%): Soulder (250 mm) Bedroc Go Extreme (4) Measure/GIS (6) width m Estimated (4)
Right Bank Channel Gradient (S4.) Distance (m): Dominant Substrate (S Sub-Dominant Substrate Feature Roughness Width Measurement Channel Dimensions	None (1) M7) Visual Clay (32.M3) ate (\$2.M3) Can't Meas Feature Width (rotal: > 40 rotal: > 40 rotal	Lawn (2)	Cropped (3) eter (2)	Meado ar Level (3) O6-2 mm) Grace MoModerate (Mean Widt Ba m Head (2)	Survey Level (4) Survey Level (4) avel (22-66 mm) Co (2)	d (5)	6)
Right Bank Channel Gradient (S4.1 Distance (m): Dominant Substrate (S Sub-Dominant Substrate Feature Roughness Width Measurement Channel Dimensions Entrenchment Surface Flow Method Wetted Width (m)	None (1) M7) Visual Clay (32.M3) ate (\$2.M3) Can't Meas Feature Width (rotal: > 40 rotal: > 40 rotal: 2 cc. Wetted Dep 1 2 Adjacent	Lawn (2)	Cropped (3) eter (2)	Meado ar Level (3) 106-2 mm) Gr. 109 Moderate (Mean Widt Ba m Head (2) mm) V 3 1	Survey Level (4) Survey Level (4) avel (22-66 mm) Co (2)	Other (5) Gradient (1) Other (5) Gradient (2) Other (5) Gradient (2) Other (3) Other (3) Other (3) Other (3) Other (4) Other (5) Other (Go Forest (7) LiDAR (6) (%): Soulder (250 mm) Bedroc 60% Extreme (4) Measure/GIS (6) width m Estimated (4) Time (s)

Into:	71.0	n Design	Unconstrained Headwater Drainage Feature Assessment Pg 2 of 2 ed #:	
Jale:	201 x	1 HOLE	POINT FEATURE DATA	312
Ground	rrier Measuren Iwater Indicato	WP#	# Perched Height (mm) Jumping Height (mm)	
WP#	Photo#	Code	Category Description	
	tional Notes		+ No Hac deserved. + Hydra soils + vegetation.	
Site E Trigg Point Categ	er 🗆 Data	Peature Typ Other: Cor	경에는 사람들이 많은 사람들이 되었다. 그렇게 하고 있는 것이 되었다면 하는 것이 없는 것이 없는 것이 없다면	on
-7- m.r	Spring/upwel Seepage are Watercress - Outlet (tile or Inlet (tile or o Beaver dam -	ing - estimate a - measure or estimate total other) - record ther) - record to measure pen	te <0.5 l/sec or >0.5 l/sec; measure temp or estimate length of bank where seepage occurs al surface area occupied ord flow status as per feature flow. Estimate volume <0.5 l/sec or >0.5 l/sec. Measure temperature of flow status as per feature flow. Estimate volume to be <0.5 l/sec or >0.5 l/sec. erched height and jumping height ordered height and jumping height	

Date: July 30	2021	Project	= 160410	995 Re	corder/Crew	J. Marcell	
Stream Name. Stream Code:				Site Code SMD-Vc2- C		2-01	
Site Limits:	Upstream Downstream	WP# _		Fis	Assessment	☐ Sample 1 ☐ Sample 2	Unconnected HDF Not connected
Direction of Assessment		■ Upstrea	m 🗆 D	ownstream		Sample 3	to downstream netwo
low Influence	☐ Freshet	(1)		☐ Spate (2)		■ Base	law (3)
Flow Condition	Dry (1) Standing	g Water (2)		☐ Interstitial Fig.		☐ Subst	antial Flow (5)
Feature Type		Natural Channe lized or Constrai read (3)		☐ No Defined ☐ Tiled Featu ☐ Wetland (6	re (5)	☐ Swale ☐ Road: ☐ Pond	side Ortoh (8)
Feature Vegetation	None (1)	1 Lawn (2)	Cropped (3)	☐ Meadow (4) 🗆 Scrublan	d (5) Wetland(6) D Forest (7)
0 - 1.5 m Left Bank Right Bank	□None (1) □ None (1) □		□Cropped (3) □ Cropped (3)	☐ Meadow (4) ☐ Meadow (4)	Scrubland (□Forest (7) □ Forest (7)
1.5 - 10 m Left Bank Right Bank	The second secon		☐ Cropped (3) ☐ Cropped (3)) Scrublan Scrublan	and the second second	4
10 - 30 m Left Bank Right Bank		☐ Lawn (2) ☐ Lawn (2)	Cropped (3)	The second secon) Scrublan		A CONTRACTOR OF THE PARTY OF TH
Dominant Substrate (S2	2.M3)	ard Pan)	Silt Sand (0.06	6-2 mm) Gravel	(22-66 mm) Co	obble (67-249 mm) Bo	oulder (250 mm) Bedroo
	e (S2.M3)				. /		
Sub-Dominant Substrat		10% Minima! (1)		0% Moderate (2) Mean Width (3)	☐ 48 - 60% ☐ Estimate		60% Extreme (4) Measure/GIS (6)
Sub-Dominant Substrat		re (1)		Mean Width (3	_		
Sub-Dominant Substrate Feeture Roughness Width Measurement Channel Dimensions	☐ < ☐ Can't Measur Feature Width (m)	re (1)	Bankfull (2)	Mean Width (3	☐ Estimate		Measure/GIS (6)
Sub-Dominant Substrate Feature Roughness Width Measurement Channel Dimensions	Can't Measur	re(1)	Bankfull (2)	Mean Width (3) Bankfu m Rig Head (2)	Estimate If Depth (mm) pht Bank Distance by Tri ne (L)	m Total me (3)	Measure/GIS (6)

Data: "	5d180	O Proje		trained Headwater Drainage Feature Assessment Pg. 2 of 2 ALCOSOS Field Assessment: Sample # 1 Sample # 2 Sample # 3
Jaic.	201 20	(3) Froje	м#	(10 10) Tield Assessment. — Bample a 1
Ground	rrier Measurer water Indicat	ors 🔲	None 🔲	Point Feature Data Perched Height (mm):
WP#	Photo #	Code	Category	Description
Addit	ional Notes		* /	Dry soil
Site B Trigge Point Categ	er 🗀 Data	Feature Typ Other: Cor	ne	
POINT ABCDEFGHIJKLMNOPQR	Seepage are Watercress - Outlet (tile or Inlet (tile or o Beaver dam Manmade da Other barrier Potential con Channel hard Culvert - note Flow transitio Flow transitio	a - measure o estimate total other) - record ther) - record measure per measure per to fish movem tamination sot tening - indica type, size and n point D/S - fi n point M/S- fi d during non-fi tient source	r estimate length of surface area occur flow status as per ched height and perched height and perched height and perched height and perched by rip-rap, arm d whether or not plow condition character ow condition character area occur.	refeature flow. Estimate volume <0.5 l/sec or >0.5 l/sec. Measure temperature. feature flow. Estimate volume to be <0.5 l/sec or >0.5 l/sec. Imping height If jumping height If jump