ACTIVE EARTH

METRO VANCOUVER

201 – 3989 Henning Drive
Burnaby, BC V5C 6P8

FRASER VALLEY

304 – 2600 Gladys Avenue
Abbotsford, BC V2S 0E9

VANCOUVER ISLAND

968 Meares Street
Victoria, BC V8V 3J4

10 – 321 Wesley Street
Nanaimo, BC V9R 2T5

OKANAGAN

201 – 13201 Victoria Road North
Summerland, BC V0H 1Z0

815 – 1499 St. Paul Street
Kelowna, BC V1Y 6P1

KOOTENAY

304 – 625 Front Street
Nelson, BC V1L 4B6

AE PROJECT NUMBER

4725
November 2025
Version 1.1

activeearth.ca

Environmental and Hydrogeological Overview Assessment

North 256 Street Industrial Lands Area Plan, Maple Ridge

PREPARED FOR

City of Maple Ridge

Ryley Scott, B.I.T.
Project Scientist

Hannah Nixdorf, B.I.T
Project Scientist

Brianna O'Brien, B.I.T
Project Scientist

Kathy Tixier, M.A.Sc., P.Eng.
Senior Hydrogeologist

Ken Lambertsen, R.P.Bio.
Partner, Senior Biologist, Senior Reviewer

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Prepared by:
Active Earth Engineering Ltd.

EXECUTIVE SUMMARY

Active Earth Engineering Ltd. (Active Earth) has completed this Environmental and Hydrogeological Overview Assessment (EHOA) of the industrial lands area north of 256 Street of Maple Ridge (the 'Study Area') for the City of Maple Ridge (the Client). The EHOA is intended to provide environmental context as an early step in the development of an Industrial Lands Area Plan for the Study Area. It has included an evaluation of groundwater conditions underlying the Study Area, analysis of riparian areas and fisheries watercourse classifications, assessment of vegetation communities and wildlife (including species at risk), identification of environmentally sensitive areas, potential wildlife corridor options, and identified potential constraints and opportunities.

The gross Study Area is an approximately 743 ha area located south of Alouette Lake, partially within the Alouette Valley, and north of the Maple Ridge community Webster's Corner at an elevation that varies mainly between 60 and 160 m above sea level (m-asl), with some areas reaching 180 m-asl. Refer to the appended Figure 1 showing the location of the Study Area. It is immediately east of Golden Ears Provincial Park and west of Blue Mountain. It includes Allco Park and the southwest-flowing Alouette River. The Study Area generally slopes to the southwest at an average grade of 5 percent and contains numerous tributaries to the Aloutte River and North Kanaka Creek within the Study Area. The western side of the Study Area is underlain by a moderately productive aquifer (No. 38), which is recharged from the Alouette River.

Vegetation in the Study Area is predominantly associated with riparian areas surrounding the tributary streams and wetlands, with extensive mature forest present across the Study Area. Non-riparian vegetation comprises young to old forest stands, which are fragmented by roads, and industrial and institutional buildings. The Study Area is dominated by coniferous forest however areas dominated by Big-leaf Maple trees are also present. Critical habitat for Oregon Forestsnail, Spotted Owl, Marbled Murrelet and Pacific Water Shrew have been designated within the Study Area. Areas dominated by Big-leaf Maple trees that overlap with the proposed critical habitat polygon for the Oregon Forestsnail must be assessed further to determine the presence of the Oregon Forestsnail. Two Common nighthawks were observed flying overhead during a field assessment; however, no other species of conservation concern were observed by Active Earth within the Study Area. Protection of the selected forest stands and streamside riparian areas should provide suitable habitat for fish, amphibian and wildlife conservation, including wildlife movement corridors.

This Assessment provides updated mapping of watercourses within the Study Area. A number of unmapped streams were identified and were considered Class B due to the presence of steep slopes and fish impassible culverts. These streams will require further assessment to

determine fish presence or absence. Additionally, fish presence was considered unlikely in a number of previously classified Class A streams due to steep slopes and impassible culverts, however, further assessment would be necessary to determine fish absence.

The non-fish-bearing creeks are considered 'nutrient streams' for their essential role in providing productive conditions for fish life in the Alouette River and tributaries supporting fish populations. All creeks within the Study Area are valuable sources of nutrients and cool water flows to Alouette River and Kanaka Creek and will require protection of riparian areas with streamside setbacks extending 15 m to 30 m from the stream or ravine top of bank.

The protection of the Alouette River and Kanaka Creek tributaries and groundwater base flows within the Study Area is the top environmental priority for the North 256 Street Industrial land use planning process. Maintenance of groundwater baseflows within the Study Area is essential for moderating the temperature, water, and nutrient flows into the Alouette River. Groundwater-fed nutrient streams, such as the creeks present in the Study Area, supply cool water at a steady rate. In contrast, runoff from developed areas typically enters streams with extremes of temperature and flow, which can be damaging to fish populations, other wildlife and vegetation, and causes increased erosion. Increases in temperature extremes as the climate changes further emphasizes the importance of these moderating effects of groundwater-fed nutrient streams.

Active Earth recommends protection of groundwater seepages within the Study Area wherever possible; most of which can be accomplished with establishing streamside protection and enhancement areas (SPEA) along creeks and protecting steep slopes (e.g. greater than 25% slopes). Low Impact Development (LID) land planning and design approaches are recommended to minimize impacts on the existing hydrologic regime within the Study Area. This is imperative for watercourses that are licensed under the *Water Sustainability Act*.

Riparian, young, and mature forests in the Study Area all provide valuable habitat to species of conservation concern. In addition to the valuable riparian vegetation protected by stream setbacks, Active Earth recommends protecting areas dominated by Big-leaf Maple to conserve habitat for the Oregon Forestsnail, if site-specific biophysical habitat requirements are present (i.e. maple and stinging nettle). This Environmental and Hydrogeological Overview Assessment has largely presented stream habitat classifications (e.g. Class A, fish-bearing) and mapped applicable streamside setbacks (15 m & 30 m SPEA) based on existing City mapping. As with species at risk critical habitat polygons and species protection, more precise refinement of streamside setbacks will require site-specific and project-specific detailed assessment by qualified environmental professionals retained for future individual development applications within the Study Area.

It should be noted that any development proposals within the Study Area will require site-

specific and project-specific detailed assessment by qualified environmental professionals and will require review and approvals by the City of Maple Ridge such as under the guidelines for a Watercourse Protection Development Permit or Natural Features Development Permit, or other applicable development permits (e.g. hazard lands, wildfire). Senior government review and approvals (e.g. B.C. Water Sustainability Act, federal Fisheries Act) may also be required for development proposals within the Study Area.

The Alouette River offers valuable habitat for wildlife, and wildlife movement corridors along the Alouette River and its tributaries could be facilitated for wildlife conservation and resident safety. This approach takes advantage of the multiple riparian setback areas it passes through as well as mature forest. A strip of land on the southern portion of the Site was previously set aside for a potential road; however, this area could also serve as a wildlife corridor if protected from development. Additionally, the BC Hydro Right of Way and forested margins along the it can serve as a wildlife corridor.

LIMITATIONS

The use of this report by anyone is subject to the following conditions and limitations:

1. This report has been prepared at the request of the client and for the specific use referred to herein. The City of Maple Ridge may rely on this report. It is not reasonable for any other party to rely on the contents of this report without first obtaining written authorization from the client and Active Earth Engineering Ltd.
2. Liability is expressly denied to any person other than the parties indicated above and those who obtain written consent. Accordingly, Active Earth Engineering Ltd. does not accept responsibility for any damage suffered by any such person as a result of decisions made or actions based on this report. Diligence by all intended users is assumed.
3. This report is believed to provide a reasonable representation of the general environmental condition at the Site as of the date of this report. The conclusions made in this report reflect Active Earth Engineering Ltd.'s best judgment in light of the information available at the time of reporting. Should additional information become available, or Site conditions change, the conclusions and recommendations of this report may be subject to change. For any party to rely on this report in the future, supplemental investigation may be necessary to verify the Site conditions at that time.
4. Active Earth Engineering Ltd. has agreed to conduct an assessment and prepare this report as requested by the client named in the report for the use specified by the client, which is stated in the report. The client has agreed that the performance of this work and the report format are appropriate for the intended use.
5. Written consent from Active Earth Engineering Ltd. must be obtained before any part of the report can be used for any purpose by anyone other than the client and other intended users identified in the report. Liability to any other party or for any other use is expressly denied regardless of who pays Active Earth Engineering Ltd.'s fee. Written consent and approval of Active Earth Engineering Ltd. must also be obtained before the report (or any part of it) can be altered or conveyed to other parties or the public through prospectus, offering memoranda, advertising, public relations, news, sales or other media.

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1 INTRODUCTION

Active Earth has been retained by the City of Maple Ridge (the Client) to provide a baseline Environmental and Hydrogeological Overview Assessment for an area referred to as 'North 256 Street Industrial Lands' (the Study Area), located south of Alouette Lake, partially within the Alouette Valley, and north of the Maple Ridge community Webster's Corner. Refer to Figure 1 Site Location Map for detailed reference. Active Earth understands that there has been increasing industrial development interest in the North 256 Street area, which has prompted the City of Maple Ridge to initiate an area planning process including baseline assessment of features and areas of environmental significance in the Study Area. This baseline Environmental and Hydrogeological Overview Assessment is intended to provide environmental context in the early stages of the North 256 Street Industrial Lands Area Plan being prepared by the City. This report is aimed to inform the City of existing environmental and hydrogeological attributes, features, and functions, as well as identify possible constraints and opportunities within the Study Area.

This Environmental and Hydrogeological Overview Assessment has included an evaluation of the groundwater conditions underlying the Site, an initial assessment of stream riparian areas and fisheries watercourse classifications, aquifers, potential high water table areas, assessment of vegetation communities, wildlife, and wildlife habitat, assessment and suitability mapping for Species at Risk Act (SARA) and provincial red- or blue-listed species.

This report documents key environmental and hydrogeological attributes in the Study Area and makes specific recommendations for the preservation and enhancement of fish habitat, groundwater resources, plant communities, wildlife (herpetofauna, mammals, and birds) habitat, rare, threatened and endangered species, and significant tree stands. Recommendations related to land use planning considerations are also provided.

1.1 Study Area

The Study Area (see Figure 1) is situated south of Alouette Lake, partially within the Alouette Valley, and north of the Maple Ridge community Webster's Corner at an elevation that varies mainly between 60 and 160 m above sea level (m-asl), with some areas reaching 180 m-asl. It is immediately east of Golden Ears Provincial Park and includes Allco Park and the southwest-flowing Alouette River. The Study Area generally slopes to the southwest at an average grade of 5 percent; however, there are several locations where steep slopes greater than 25% occur (refer to Figure 2, Slope Map). The east edges of the Study Area include the steep slopes of Blue Mountain. Existing industrial operations and 256 St. are situated on a plateau in the central part of the Study Area. A narrow escarpment dropping to another generally flat bench comprising the Alouette River floodplain forms the west boundary of the Study Area.

The North 256 Street Industrial Lands Area Plan boundaries comprise a gross area of approximately 743 ha. The Study Area is characterized by rural, industrial, institutional, and

park land with large acreages, many of which containing second- or third-growth forest, while others have paved or bare land.

Key existing environmental features within the Study Area include several creeks classified by the City of Maple Ridge as fish-bearing (nine) and non-fish-bearing (two) streams (refer to Figure 8). In addition, fish-bearing creeks are located outside and close to the Study Area (including the Alouette River), and in several cases the stream setbacks will overlap the proposed Study Area. During the field assessments, Active Earth identified a number of unmapped watercourses that provide groundwater baseflows from springs. Most of these streams were considered non-fish bearing by Active Earth based on the presence of steep slopes and fish impassible culverts; however, further site-specific assessment would be required to determine fish presence or absence. There are also numerous drainage watercourses and constructed ditches (along property lines and roadways) that collect surface runoff and groundwater and flow to the creeks in the Study Area.

There are species-at-risk critical habitat area designations (polygons) that have been identified by provincial and federal conservation agencies that also constitute key environmental features within the Plan area/ Study Area.

In addition to the riparian vegetation which is present along most of the creeks in the Study Area to varying degrees, several second- and third-growth forest stands exist in the Study Area. The Study Area also includes a band of Old-growth Management Area in the northwest corner (Figure 9) overlapping with Golden Ears Provincial Park. Although the forest stands are fragmented by homes, industrial and institutional buildings, and roads, there remains a degree of connectivity in areas between creeks and through undeveloped land in the Study Area. Areas of mature forest in the Study Area are generally associated with the various creeks as they near the Alouette River and Blue Mountain, and they form continuous connections with the forest within Golden Ears Provincial Park.

1.2 Methodology

The methodology for this Environmental and Hydrogeological Overview Assessment has included use of existing information resources, mapping and reports, as well as selective field reconnaissance, to assess key environmental attributes in the Study Area. The assessment has provided a basis for making specific recommendations for the preservation and enhancement of fish habitat, groundwater resources, vegetation communities, wildlife and species-at-risk habitat, and significant tree stands.

1.3 Scope

The scope of work for this Environmental and Hydrogeological Overview Assessment has included:

- Reviewing available information resources (e.g. Maple Ridge online mapping Ridge View and City-provided GIS shape files, surficial geology mapping, BC Water Atlas, Conservation

Data Centre, Habitat Wizard, BC Species and Ecosystems Explorer, iMapBC), several reports on properties within the Study Area provided by the City, and other databases and other reports available for the Study Area.

- Conducting a review of terrestrial and aquatic flora and fauna, habitats, and associated attributes, features, and functions.
- Reviewing available data relating to groundwater distribution and movement in subsurface soils and rocks, including mapped aquifers, artesian wells, springs, water table, recharge and discharge areas. Reports and databases reviewed are included in Section 11 of this report.
- Characterization of watercourses and setbacks, wetlands, ditches, past and present flows, source of flows, direction of flows, fish habitat values, fish presence / occurrences, aquatic / semi-aquatic vegetation communities, drainage features, water table levels, soil attributes, channel substrate characterization, habitat connectivity up- and downstream, and provide representative photographs.
- Identification of wildlife habitat values, vegetation community characterization, connectivity to adjacent terrestrial habitats, species detections / documented presence of wildlife, sign and evidence of suitable habitat, any known nests, critical habitat / species at risk with known nearby occurrences / potential to occur, and photos depicting habitat types and important features from field reconnaissance.
- Conducting targeted field reconnaissance to determine the location and extent of watercourses (mapped or un-mapped), wildlife use and presence, vegetation composition and conditions, invasive species, and any environmentally significant features within the Study Area
- Preparing this report that documents assessment findings which describe the hydrogeologic, aquatic, and terrestrial resources within the Study Area and associated constraints and opportunities. Recommendations provided in the report will be tailored towards achieving and maximizing industrial land use while protecting environmental and hydrogeological attributes, features, and functions.

1.4 Background Information

Prior to the field assessments, pertinent background information and online mapping resources (including Ridgeview) provided by the City have been reviewed in order to focus field observations on key watercourses, identified terrestrial habitats, and those species and habitats with a high potential for occurrence in the Study Area.

The BC Conservation Data Centre (CDC) and BC Ministry of Environment Habitat Wizard were searched for species at risk that have mapped occurrence or critical habitat within the Study Area. The BC Ministry of Environment Habitat Wizard was also reviewed for existing fish presence data within the Study Area. Aerial photographs and Lidar images of the Study Area

were examined to identify possible unmapped streams and existing streams and ravines, and potential habitats and wildlife corridors were identified.

1.5 Field Surveys

Hydrogeological field observations of selected areas within the Study Area were completed by Kathy Tixier, P.Geo (Senior Hydrogeologist) and Daniel Battista, B.Sc (Environmental Technician) on August 20, 2025. These involved touring select properties on foot and/or in vehicles in the presence of the landowners. Sites situated in groundwater discharge areas (e.g. with springs or mapped wetlands) or where surficial sediments were likely to be exposed (e.g. gravel pits) were preferentially selected. During the site visits, landowners were asked a series of questions about site drainage and groundwater conditions and stormwater management practices and challenges.

Environmental field observations were completed by Ken Lambertsen, R.P.Bio (Senior Biologist), Claudio Bianchini, R.P.Bio (Senior Wildlife Biologist – Bianchini Biological Services), Brianna O'Brien, BIT (Project Scientist), and Becky Loverock, M.Sc (Environmental Technician) on August 21, 2025.

Active Earth arranged access to several properties the Study Area selected for field observations by contacting landowners for permission with City assistance. Active Earth also viewed areas of interest from the adjacent roads or trails and used a drone to observe difficult to access features (e.g. ponds, wetlands) beyond existing facilities and operations. Drone use was avoided where restricted areas are situated (e.g. penitentiaries).

Field assessments for watercourses were completed during dry conditions (i.e. more than 48 hours after a significant rainfall event). The objectives of the field assessments were to examine watercourse features, assess the watercourse classifications or consider possible changes in existing classifications, and identify any unmapped watercourses or aquatic habitats within the Study Area. Selected watercourses were observed for fish and aquatic habitat attributes and to assess transitions from fish-bearing to non-fish-bearing classifications (e.g. fish migration barriers), and significant features (e.g. wetlands, springs).

Field assessments also have been conducted to observe intact habitats and determine the potential to support wildlife, particularly rare and endangered species. Visual encounter foot transects were traversed within the Study Area throughout selected forested areas and along the treed perimeters to identify wildlife habitat. Any direct visual or auditory observations of wildlife or nest encounters were recorded.

2 REGULATORY FRAMEWORK

The legislation, regulations and best management guidelines that apply to land use and development within the Study Area are presented in the following table.

APPLICABLE LEGISLATION AND NON-REGULATORY GUIDELINES

Document	Description	Applicability and Project Compliance
Federal Legislation		
Migratory Bird Convention Act, 1994, and Migratory Birds Regulation (2022) Environment and Climate Change Canada (ECCC)	Legal framework for the protection and conservation of migrating birds and their nests.	If there is potential to affect birds and / or active nests and eggs, nest surveys must be conducted. If vegetation removal activities are proposed to occur during the defined nesting period, a QEP shall conduct an intensive survey of the Site where vegetation is to be removed.
Impact Assessment Act, 2019, ECCC	Federal process for impact assessments to prevent significant adverse environmental effects	Act would apply to development at the Site. Work must be conducted in a way that mitigates any significant adverse environmental effects.
Species at Risk Act (SARA), 2002, ENV	To prevent the disappearance of wildlife species in Canada, and to support the recovery of wildlife species that are extirpated, endangered, or threatened, and to manage species of special concern.	Act applies to development at the Site. The Site overlaps with critical habitat polygons for Species at Risk.
Fisheries Act, 1985, DFO, amended 2019	To provide a framework for the proper management and control of fisheries and the conservation and protection of fish and fish habitat.	Act applies to development at the Site. As various water courses are located within the Site it is important to preserve fish habitat and prevent pollution or the release of deleterious substances into any watercourse.
Provincial Legislation		
BC Environmental Management Act (EMA), S.B.C 2003, c. 53, as amended, BC Environment and Climate Change Strategy (BC ENV)	Provides overall framework for protecting the quality of water, land and air.	Act applies to development at the Site. Development at the Site must be conducted in a manner that avoids harm to water, land, and air.
Contaminated Sites Regulation (CSR), B.C. Reg. 375/96, as amended, BC ENV	Provides standards for contaminated site assessment and remediation. This dictates the quality of fill soil allowed to be imported to the Site, and approvals required for import.	Off-Site disposal to provincial lands of any suspect contaminated soil, vapour, groundwater, or sediment must be managed according to the CSR. This would be applicable to excavation activities at the Site where soil would require off-Site disposal. Additionally, water within excavations must be managed according to the CSR for off-Site discharge.

APPLICABLE LEGISLATION AND NON-REGULATORY GUIDELINES

Document	Description	Applicability and Project Compliance
Hazardous Waste Regulation (HWR), B.C. Reg. 63/68, last amended by B.C. Reg. 76/2022, BC ENV	Addresses the proper handling and disposal of hazardous waste under the EMA.	Applicable to development at the Site if hazardous waste, such as waste petroleum products, will be produced during development. All hazardous waste must be handled and disposed of in accordance with the HWR.
Water Sustainability Act, 2016, Ministry of Water, Land and Resource Stewardship (WLRS)BC ENV	Manages the diversion and use of water resources to ensure a sustainable supply of fresh, clean, water to BC residents.	Water courses and aquifers are located within the Site, therefore, the Act would be applicable to development at the Site. Any beneficial use of ground or surface water (e.g. for industrial purpose) would require a water License. Any short-term diversion of groundwater (e.g. for excavation dewatering) would require a Use Approval.
Public Health Act, 2008, Ministry of Health	Provides regulations to protect the quality of water in streams and aquifers, particularly with respect to drinking water sources	The Health Hazards Regulation and Sewerage System Regulation set out minimum horizontal setbacks between water supply wells and potential sources of contamination (e.g. sewerage systems, dumping grounds, cemeteries)
Wildlife Act, 1996, BC ENV	Provides regulations and guidelines for the conservation and management of wildlife and wildlife habitats, including fishing and hunting.	Act would apply to development at the Site. Breeding birds, their eggs and their young are protected until the nest is no longer occupied. The Breeding Bird period generally extends from March 1 to August 31. Vegetation removal during this period must be preceded by a bird nest Survey.
Wildfire Act, 2004, Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD)	Defines legal responsibilities and obligations regarding wildfires in BC.	Act would be applicable to development at the Site.
Spill Reporting Regulation (SRR), B.C. Reg. 187/2017, as amended	Defines “spill” and includes requirements for reporting through the Environmental Emergency Program (EEP).	Act would be applicable to development at the Site since there would be potential for spills to occur during construction activities.
Riparian Areas Protection Regulation, 2019	Regulates environmental setbacks for streams, ditches, wetlands, and lakes to retain fish habitat.	Applies to development at the Site. Industrial development within the 30m Riparian Assessment Area of a stream, ditch, lake, or wetland, would require a riparian areas assessment.

APPLICABLE LEGISLATION AND NON-REGULATORY GUIDELINES

Document	Description	Applicability and Project Compliance
Weed Control Act, B.C.	Provides regulations and guidelines for the control of noxious weeds growing or located on land and premises.	Applies to the Site. Noxious weeds listed under Schedule A of the Weed Control Regulation under the Weed Control Act were observed on-Site. An invasive species management plan must be prepared for development in areas where noxious weeds are present.
Municipal Bylaws and Policies		
City of Maple Ridge Tree Protection & Management Bylaw No. 7133-2015.	Protects and enhances the urban forest by: providing protection and preservation of trees, providing for the replacement of trees where tree removal is necessary, and ensuring that lots that are being developed have sufficient tree canopy.	Bylaw would apply to any tree removal at the Site.
City of Maple Ridge Watercourse Protection Bylaw No. 6410 - 2006.	Prohibits polluting, obstructing, or impeding flow of any stream, creek, waterway, watercourse, waterworks, or drainage system within the City of Maple Ridge.	Bylaw applies to development at the Site. An Erosion and Sediment Control Plan (ESC) would be required for any development at the Site.
Guidelines and BMPs		
British Columbia Approved and Working Water Quality Guidelines (BCWQG) – BC ENV	Guidelines for Surface Water Quality	Activities associated with development, such as clearing vegetation and stockpiling of soils, have the potential to create sediment laden run-off. Discharging surface water from the Site into City storm sewer would require that the water quality meet the BCWQG.
Joint Professional Practice Guidelines – Erosion and Sediment Control	Guide for developing and monitoring Erosion and Sediment Control Plans in BC.	Activities associated with development, such as clearing vegetation and stockpiling of soils, have the potential to create sediment laden run-off.
Develop with Care 2014, Environmental Guidelines for Urban and Rural Land Development in British Columbia	Guidelines for maintaining environmental values during the development of urban and rural lands.	The Site is comprised of mixed land uses, therefore, the Environmental Guidelines for Urban and Rural Land Development in British Columbia should be followed.

APPLICABLE LEGISLATION AND NON-REGULATORY GUIDELINES

Document	Description	Applicability and Project Compliance
Invasive Species Council of Metro Vancouver Best Management Practices	Guidelines for managing various invasive species located in Metro Vancouver.	Development activities may disturb boulevards and other natural spaces, making them more susceptible to invasive plant species. Precautions must be taken to avoid impacts to the environment by minimizing the presence of invasive plant species.

The Province has jurisdiction over groundwater and surface water resources in BC. The *Water Sustainability Act* and *Environmental Management Act* are the key pieces of legislation intended to protect water quality and quantity for future generations. Similarly, Low Impact Development (LID) is a land use planning approach that that aims to manage stormwater runoff as close to its source as possible. Local governments implement this approach through Integrated Stormwater Management Plans (ISMPs), design guidelines and development permit areas. The following table summarizes LID objectives in BC:

Objective	Description	Key Strategies
Mimic Natural Hydrology	Restore pre-development water balance (infiltration, evapotranspiration, runoff)	Rain gardens, green roofs, bioswales
Reduce Runoff and Peak Surface Flows	Limit stormwater runoff and its intensity	On-site infiltration, detention, and evapotranspiration systems
Protect and Enhance Ecosystems	Maintain healthy aquatic and riparian habitats	Preserve riparian areas, wildlife corridors, buffer zones
Improve Water Quality	Filter and treat stormwater at the source to reduce pollution	Bioretention systems, swales, vegetated filter strips
Integrate with Land Use Planning	Align stormwater practices with sustainable development	Compact design, mixed-use zoning, green development incentives
Promote Groundwater Recharge	Support natural infiltration to ground (aquifer recharge) and groundwater baseflows to streams	Permeable surfaces, infiltration trenches, rain gardens
Reduce Infrastructure Costs	Lower capital and maintenance costs of stormwater systems	Decentralized, small-scale green infrastructure

3 CLIMATE

Maple Ridge has a temperate oceanic climate. According to Climate Normals published from the nearest weather station at Maple Ridge Kanaka Creek between 1981 to 2010 (most recent

set available), the daily average temperature varies between 2.4°C in December and January and 17.8°C in July and August. The average monthly precipitation varies between 59.4mm in July and 308.2mm in November. This station is a 76 m elevation, which is approximately equivalent to the elevation in the southwest corner of the Study Area (Allco Park).

Climate change is expected to bring an increase in extreme weather and heavy precipitation events, resulting in higher precipitation during the winter rainy season and a longer summer drought. Statistically downscaled global climate projections using the Canadian Downscaled Climate Scenarios-univariate dataset for CMIP6[1] for a 6 by 10 km grid cell centred at Websters Corners indicate that between 2021 and 2050, the mean annual temperature will increase 1.6°C relative to baseline (1971-2000) and the total annual precipitation will increase by at least 55mm. The hottest day will be 2.1°C greater than the baseline (32.2°C median value) and the maximum 1-day precipitation will be 5 mm more than to baseline (ranging from 58 to 66 mm in one day). These predictions do not take in extreme weather events (atmospheric rivers, heat domes, etc).

4 GROUNDWATER RESOURCES

4.1 Bedrock Geology

The study area is underlain by quartz dioritic intrusive rock dating back to the Middle Jurassic to Early Cretaceous periods of the Mesozoic Era. Identified as Units LJKqd and MLJqd on local geologic mapping[2], they consist of weakly to well foliated quartz diorite, minor granodiorite, minor orthogneiss, and minor gneissic diorite. Those rocks underlying the Alouette River Valley are interpreted to be younger (Late Jurassic to Early Cretaceous) than those underlying the rest of the Study Area (Middle to Late Jurassic). In most places, bedrock throughout the Study Area is blanketed by a thick layer of surficial sediments.

4.2 Surficial Geology

A map showing the local surficial geology is included as Figure 3[3]. The Alouette River incises into glaciofluvial channel fill, floodplain, and ice-contact gravel and sand from the Fort Langley Formation (FLb). These sediments were deposited roughly 12,000 years ago during the Late Fraser Glaciation as the continental ice sheets melted and are typically 5-20 m thick.

Much of the Site is underlain by glaciofluvial sandy gravel and gravelly sand that represent proglacial deltaic deposits (Vb). These deposits can be up to 20 m thick and are part of the Vashon Drift, which is slightly older than the Fort Langley Formation. Deposition occurred

[1] Sobie, S. R., Ouali, D., Curry, C. L. et Zwiers, F. W. (2024). Multivariate Canadian Downscaled Climate Scenarios for CMIP6 (CanDCS-M6). Geoscience Data Journal 11: 806-824. https://doi.org/10.1002/gdj3.257

[2] Bellefontaine, K., Alldrick, D. and Desjardins, P.J., 1994. Mid Coast (all or parts of 92F, G, J, K, L, M, N; 93D; 102P; 103A). British Columbia Ministry of Energy, Mines and Petroleum Resources, British Columbia Geological Survey Open File 1994-17.

[3] Map 1484A. Surficial Geology, New Westminster, West of Sixth Meridian, British Columbia. Based on geological observations by J.E. Armstrong (1949-52, 1973-75), W.L. Brown (1949-50) and S.R. Hicock (1974, 1976).

during the Fraser Glaciation around 17-18,000 years ago when the Cordilleran Icesheet made its last major glacial advance, producing these sediments in the process. A narrow section of till (Va) that trends northeast-southwest is found in the northern half of the Site, adjacent to a similarly-trending till strip of various origins (UPV) from the Undivided Pre-Vashon Drift.

Bedrock outcrops within the Site boundary consist of pre-Tertiary bedrock (PT), namely Mesozoic and Upper Paleozoic sedimentary, volcanic, granitic, and metamorphic rock. Elsewhere, it is blanketed by 1 to 5 m of glacial material. Figure 3 shows a reproduced map of the surficial geology surrounding the Site.

4.3 Mapped Aquifers

4.3.1 Aquifer No. 38

The western side of the Study Area is underlain by provincially-mapped Aquifer No. 38. The outline of the aquifer is shown in Figure 4, and a cross section is given in Figure 5. Aquifer Factsheets and Mapping Reports for Aquifer No. 38 are included in Appendix A.

This aquifer is 16.9 km^2 in area and is comprised of three unconsolidated units: two gravel and sand units and a till unit. These sediments are from a variety of formations, namely the Salish Sediments, Fort Langley Formation, and Vashon Drift. However, within the Study Area, there are no surficial Salish Sediments present. Only about 1.5 km^2 of the aquifer is within the Study Area. The remainder extends westward along the Alouette River.

Aquifer No. 38 is classified as Aquifer Sub-type 1b, meaning it is a predominantly unconfined fluvial or glacio-fluvial sand and gravel aquifer found along a river – in this case, the Alouette River. The confining layer, where present, is composed of till and/or clay, and is 12.5 m thick on average. There are 41 water supply wells correlated to this aquifer across its entire footprint. The median reported depth to groundwater is 4.3 m on average. The Aquifer is moderately productive, with a median driller-estimated yield of 0.85 L/s (13.5 gpm).

Aquifer No. 38 has been classified as moderately vulnerable to surface-sourced contamination, particularly in areas where the confining layer is absent, the water table is shallow and where it may be hydraulically connected to the Alouette River. The Province's vulnerability classification speaks to how easily an aquifer can be contaminated by surface activities, and is based on the aquifer matrix (e.g. sand and gravel vs. bedrock), overlying material (e.g. thickness of overburden and presence/absence of a confining layer) and depth to water table.

The general groundwater flow direction in Aquifer No. 38 is inferred to be toward the southwest, subparallel to the Alouette River. Recharge to the aquifer is sourced from infiltration of surface water runoff from upland areas. The Alouette River may also recharge the aquifer.

Figure 5 shows a hydrogeological cross section drawn along the transect A-A'. It illustrates the explored depth of aquifer sediments and groundwater levels in relation to that of the Alouette River. Beneath the River floodplain, the sand and gravel deposits that host the aquifer are very thick: greater than 50m. In the northeastern reaches of the aquifer, they do not appear

to be confined by a till or clay layer and groundwater levels are about 10m lower than Alouette River levels. Moving down valley to the southwest, groundwater levels and river water level merge and are most likely hydraulically connected. Where they are connected, groundwater has the potential to contribute baseflow to the Alouette River and the River has the potential to recharge the Aquifer.

Groundwater also contributes flow to the Alouette River by means of spring-fed tributaries that are sourced along the escarpment to the east. These springs originate where the water table intersects the sloping ground surface. The tributaries then carry this groundwater 'baseflow' via surface pathways into the Alouette River.

4.4 Groundwater Quality

Water quality data collected at select locations across the British Columbia are made publicly available through the Environmental Management System (EMS) database. There is some groundwater quality data available for monitoring wells situated near an infiltration pond at the Firefighting Training Institute (FTI) and surrounding a tile field at the Justice Institute of BC (JIBC). Their purpose is to monitor any impacts to groundwater from these facilities in compliance with a waste discharge permit.

Two monitoring wells situated 10 and 200 m from the infiltration pond at the FTI (EMS IDs E105870 and E105873) had been monitored between 1985 and 1987. Their locations are shown on Figure 4. These were tested for wastewater parameters (ammonia, chemical oxygen demand, sodium, oil and grease, filterable residue, specific conductance etc.) and results appear to be within acceptable ranges.

Three monitoring wells (EMS IDs E308408, E308409 and E308410) at the north, middle and south ends of a tile field at the JIBC were established in 2017 (Figure 4). Unfortunately, this data has not been made publicly available.

There are no groundwater supply wells providing water for public consumption currently listed in the EMS database within the Study Area.

4.5 Local Groundwater Use

The table below summarizes pertinent construction and lithological information for wells located within 1000 m of the center of the Study Area. The locations of these wells are shown in Figure 4, labelled by Well Tag Number (WTN).

WELLS WITHIN APPROXIMATELY 1000 M OF STUDY AREA

Address	Well Tag Number	Driller Estimated Yield (USgpm)	Well Depth	Static Water Level	Aquifer No.
24686 130th Street	51001	20+	38	5	38
24555 130th Ave	49604	15	36	4	38

Address	Well Tag Number	Driller Estimated Yield (USgpm)	Well Depth	Static Water Level	Aquifer No.
24440 128th Ave	45105	30-40	100	20'3"	1102
Alouette Rd, Maple Ridge	44756	9	97	Unknown	1102
28042 Alouette Rd, Haney	40186	20	81	35	38
13015 Alouette Rd	24854	5	73	7	38
Alouette River, Haney	27106	3	98	37	38
24686 130th Street	67353	8	205	Flowing	897
12831 Alouette Rd	41123	35-40	60	18	1102
12724 246th Street	108504	20	233	161	1102
13075 Alouette Rd	33249	5	40	27	38
24696 130th Ave	67326	20+	138	19	38
-	18112	12	42	7'3"	38
13109 Alouette Rd	24917	25	41	18	38
11880 236th Street	21730	8	63	32	38
-	14294	8	104	22.5	38
Alouette River Institute	51505	720	125	57	38
248 Street, Maple Ridge	83597	20	118	68	38
25410 130th Ave	33052	-	80	83	38
-	11597	-	12	Near surface	38
-	11620	-	12	Unknown	1102
-	11622	-	6	Unknown	1102

Note: Grey shaded font denotes well within Study Area

Most wells are associated with Aquifer No. 38 and driller-estimated (pumped) yields vary from 5 to 40 US gallons per minutes (USgpm). The average finished depth of wells within 1000 m of the Study Area is 81.9 ft-bg and the average static water level is 36.5 ft-bg. Only one well, WTN 67353, was reported to be flowing artesian. This means that the potentiometric water level is above the ground, thereby causing the well to flow naturally at the driller-estimated rate of 8 USgpm.

Very few wells exist along 130th Avenue – the only registered wells are WTN 33502 and 11597. Well WTN 11597 is a dug well with shallow water table and WTN 33502 is a drilled well that was abandoned owing to insufficient yield. Clearly, the most productive parts of mapped Aquifer No. 38 are along the Alouette River floodplain, on the east side of the Study Area.

There are no licensed wells within 1000m of the Study Area.

4.6 Local Surface Water Licences

There are several active surface water licences on the creeks within and surrounding the Study Area. Several of these creeks originate from elevations of 100 m or greater and flow towards the Alouette River. Additional details of these active surface water licenses are summarized in the Table below. In compliance with the *Water Sustainability Act*, these rights to water for conservation or domestic use are protected and must be taken into account in any land development proposal that could impact flows in the named drainages.

SUMMARY OF CURRENT SURFACE WATER LICENCES WITHIN 500 M OF THE STUDY AREA

License No.	Quantity	Purpose	Source Name	Licensee	Status
C114028	734 m^3/d	Conservation: Use of Water	Allco No. 1, 2, 3, 4 Spring	Fisheries & Oceans Canada	Current
C061648	13,038 m^3/d	Conservation: Use of Water	Alouette River	Ministry of Attorney General	Current
C132928	12,960 m^3/d	Conservation: Use of Water	Alouette River	Alouette River Management Society	Current
C061708	7344 m^3/d	Conservation: Use of Water	Mike Lake Creek	Corrections Branch – Alouette Centre	Current
F020289	2.2731 m^3/d	Domestic	Zirk Brook	Private Individual Name	Current
F048710	4.5461 m^3/d	Domestic	Carter Spring	Private Individual Name	Current

Note: Grey shaded font denotes surface water license within Study Area

5 HYDROGEOLOGICAL CONCEPTUAL MODEL

Groundwater conditions vary widely across the Study Area. Saturated sand and gravel deposits with the potential to yield substantial quantities of groundwater for beneficial use have been mapped as part of Aquifer No. 38. This aquifer is hosted in the Fort Langley sediments filling the Alouette River Valley and in part of the adjacent Vashon Drift sediments. The that we interpret to offer high groundwater supply potential is outlined in Figure 4. The high driller estimated yield (720 USgpm) for the well that services the Alouette Correctional Centre for Women (WTN 51505) is proof of the aquifer's high productivity in the floodplain area.

Groundwater in Aquifer No. 38 is interpreted to be sourced from rainfall and runoff that infiltrates the permeable Vashon Drift sediments that blanket bedrock across the majority of the Study Area. These 'Recharge' areas are denoted with an "R" on Figure 4. Groundwater flows to the southwest in a radial pattern, from areas of high elevation to low elevation. Where the topographic 'bench' of Vashon Drift deposits drops down to the Alouette River floodplain, there are numerous seepages or springs. These are identified with a "D" for groundwater 'Discharge' area on Figure 4 and constitute the headwaters of creeks including Gypsey, Cooke, Engels, Dickens, Doggett, Chaplin, and Bath Creeks. Some of the named springs (e.g. the Allco No. 1, 2, 3 and 4 Springs) are protected by licenses.

With reference to the hydrogeological cross section on Figure 5, Aquifer No. 38 is interpreted to be recharged by the Alouette River throughout most of the study area. In the southwest corner, where the water table and River water level reach the same elevation, they are interpreted to be hydraulically connected. In these areas, the Aquifer could be losing water to the River and vice versa, depending on river stage and groundwater elevation. It is challenging to draw additional cross-sections from east to west across the Study Area owing to the lack of deep water supply or monitoring well information.

Soils in low-lying areas bordering 128th and 130th Avenues are inherently moist during most of the year. This is due in part to groundwater discharge at the toe of the Vashon Drift deposits and to the presence of soils that are fine grained in texture and poorly draining. Mapped wetlands at the western terminus of the east-west road corridor and in the southwest corner of 13301 251A Street are an expression of such poorly drained discharge areas. To the east, along 128th Street, Badger Brook and tributaries to Websters Creek are vulnerable to flooding in winter when they are surcharged with runoff from upland areas[4].

The already industrialized lands in the northern portion of the Study Area receive runoff from adjacent upland areas to the east, which is largely conveyed through a network of east to west flowing watercourses. Several wetlands in the vicinity also drain to these watercourses (Figure 7). Surficial sediments are expected to be saturated at shallow depth and not very transmissive, possibly due to shallow bedrock or a higher fraction of fines in the Vashon Drift.

[4] Anecdotal account from Jason Owen, part owner of property at 25927 128th Avenue

Where the ground surface drops sharply to the Alouette River floodplain, springs feeding small creeks are common.

6 WATERCOURSES

The Study Area/ Plan Area is situated within the Alouette River watershed for the most part with the southeast portion of the Study Area being part of the Kanaka Creek watershed.

The Alouette River originates within Golden Ears Park and enters Alouette Lake, which is regulated by a dam for the generation of hydroelectric power. From the dam, it flows in a southwesterly direction through the City to its confluence of the Pitt River. Floods have been reported historically in low-lying downstream areas west of the Study Area. These can occur during heavy runoff events when BC Hydro must spill more water from the dam to protect its integrity. Under normal circumstances, the flow in the Alouette River is about 21 m^3/s. Flooding of downstream areas has historically occurred when flows reach about 100 m^3/s[5].

Many of the streams within the Study Area have been named as shown on Figure 1. Figure 1 shows topographic contours at 10-m intervals. It is evident from those topographic contours where slopes off Blue Mountain change from westward to southward representing the watershed boundaries for Alouette River and Kanaka Creek within the Study Area. The watercourses on the northern and western portions of the Study Area flow westward to an unmapped roadside drainage channel which is culverted in multiple locations, allowing flows to continue westward toward the Alouette River, which flows south. This includes Frodo Creek, Mud Creek, Cooke Creek, Engles Creek, Dikens Creek, Doggett Creek, Chaplin Creek, and Bath Creek. The watercourses on the southeastern portion of the Study Area (Sawdust Creek, Webster Creek, Badger Brook, and North Kanaka Creek) flow south. The substrate of the creeks generally consisted of sand and gravel.

Areas within the Study Area that have been identified by Northwest Hydraulic Consultants (2016) as 'flood hazard' areas are within the Alouette River floodplain and along Mudd, Sawdust, Websters, and North Kanaka Creeks (Figure 8). Low-lying areas along the south boundary of the Study Area are also prone to flooding.

The following sections describe the types and features of watercourses in the Study Area, known fish presence or absence within streams, and key issues associated with the ecological function and integrity of the watercourses. In this report, watercourses are also referred to as streams, or creeks, or ditches as well as lakes, ponds and wetlands.

6.1 Watercourse Protection

The City of Maple Ridge has several mapped streams within the Study Area which require protection through establishing streamside setbacks based on the former BC 2001 Streamside Protection Regulation (SPR) setback determination methods set out under the City's

[5] UBC Floodplain maps and floodplain analysis for Alouette River, date unknown

Watercourse Protection Development Permit (WPDP) guidelines. The SPR defines a stream as "a watercourse or source of water supply, whether usually containing water or not, a pond, lake, river, creek, brook, ditch and a spring or wetland that is integral to a stream and provides fish habitat". A Streamside Protection and Enhancement Area are defined as "an area adjacent to a stream that links aquatic to terrestrial ecosystems and includes both the riparian area vegetation and the adjacent upland vegetation that exerts an influence on the stream".

Protection of fish habitat in streams is required under the federal Fisheries Act which prohibits the death of fish (other than under fishing licences) and the harmful alteration, disruption or destruction of fish habitat (HADD). The provincial Riparian Areas Protection Regulation (RAPR) applies to any development proposed within 30 m of a stream top of bank and sets out the technical methodologies for determining streamside setback and enhancement areas (SPEA), unless there is a local government bylaw that meets or exceeds the requirements under RAPR for protecting streams and riparian areas along the streams. The provincial Water Sustainability Act (WSA) also provides protection of streams as water resources and fish and aquatic habitat, including isolated ponds or wetlands that are not connected by surface flow to fish habitat in other streams. Development activities that necessarily encroach into streams and their riparian setbacks (e.g. road crossing culverts, stormwater outfalls) must be authorized under the WSA (i.e. changes in or about a stream) and/or under the Fisheries Act. The City of Maple Ridge's Watercourse Protection Development Permit (WPDP) guidelines meets and exceeds the RAPR requirements and has incorporated the watercourse and fish habitat protection requirements under the WSA and Fisheries Act.

In Maple Ridge, Streamside Protection and Enhancement Area (SPEA) setbacks are primarily determined using classifications of presence of fish (fish-bearing), permanence of the stream, and an assessment of the extent of existing and potential riparian area vegetation. Under the SPR a fish bearing stream is defined as "a stream in which fish are present or potentially present if introduced barriers or obstructions are either removed or made passable for fish". A non-fish bearing stream is defined as "a stream that (a) is not inhabited by fish, and (b) provides water, food and nutrients to a downstream fish bearing stream or other water body". If fish presence is not known, it may be necessary to carry out field sampling of fish. If no fish are known to be present, fish bearing potential should also be assessed. Certain stream conditions are considered impassible for fish, meaning there is no reasonable potential for fish presence, even with flow or access improvements. These include:

- Very low or no flow during critical fish life stages (cannot be fixed with flow enhancement).
- Natural barriers like high waterfalls or steep cascades that fish can't jump over, even during high flows.
- Permanent human-made barriers, such as:
    - Large weirs or dams
    - Long stretches of enclosed (e.g., piped) or heavily channelized stream sections

The SPR defines permanent streams as streams that typically flow for more than six months of the year. A non permanent stream is defined as "typically containing surface waters or flows for periods less than 6 months in duration".

The SPEA must be measured from the Top of Bank, which is defined for three situations as:

- "the point closest to the boundary of the active floodplain of a stream where a break in the slope of the land occurs such that the grade beyond the break is flatter than 3:1* at any point for a minimum distance of 15 metres measured perpendicularly from the break,"
- "for a floodplain area not contained in a ravine, the edge of the active floodplain of a stream where the slope of the land beyond the edge is flatter than 3:1 at any point for a minimum distance of 15 metres measured perpendicularly from the edge".
- Top of the ravine bank: "the first significant break in a ravine slope where the break occurs such that the grade beyond the break is flatter than 3:1* for a minimum distance of 15 metres measured perpendicularly from the break, and the break does not include a bench within the ravine that could be developed". Riparian vegetation can be classified as existing or potential vegetation."

Existing Vegetation: "means native and non-native vegetation".

Potential vegetation: "is considered to exist if there is a reasonable ability for regeneration either with assistance through enhancement or naturally and considered to not exist on that part of an area covered by a permanent structure".

For fish-bearing streams (red-coded on mapping), the WPDP guidelines for determining streamside setbacks (SPEA) apply a 30 m setback measured from the stream top of bank (TOB). Non-fish-bearing streams (yellow-coded) are subject to a 15 m SPEA. For wide ravines (>60 m between ravine TOB), the SPEA is measured 10 m from the ravine TOB. Streamside setbacks (SPEA) for streams in the Study Area, including ponds and wetlands with surface flow connections to fish habitat, are shown on Figure 8 for detailed reference.

Based on the background data, aerial photography, Lidar topographic relief mapping and limited ground-truthing, the Active Earth assessment is consistent with that of the City of Maple Ridge (as recorded on Maple Ridge GIS) for the majority of the streams in the Study Area. However, Active Earth has identified several watercourses and associated features during the field reconnaissance which have not been mapped on Ridgeview to date. Refer to notations on the Streamside Setback Map in Figure 8 for details.

Verification in the field primarily consisted of locating unmapped streams and assessing fish barriers such as steep slopes and waterfalls. Comprehensive fish sampling surveys have not been conducted for this overview assessment. Locations where flowing water (i.e. groundwater) during dry weather (e.g. more than 48 hours following rainfall) was observed have been noted as streams on Figure 8 as they were connected to fish habitats by surface

flows. Field assessments have been conducted during dry weather conditions on August 20 and 21, 2025, which facilitated identification of groundwater discharges and indications of stream permanence. Assessment of probable fish-bearing status for unmapped and mapped streams was based on observations of stream channel width, depth at high water mark and low water, stream gradient, channel morphology, and the presence or absence of deep pools.

The northeast corner of the Site was assessed, and the presence of lakes/reservoirs and streams was confirmed, using drone imagery. Unmapped watercourses and wetlands were identified in this area and are shown on Figure 8. The full extent and connection of these features was not determined; however, a connection between an unmapped roadside stream and Frodo Creek was observed and confirmed during the August 21 field assessment.

Two lakes/reservoirs were mapped on Ridgeview GIS as connected across 256th Street. Field observations confirmed that these features were not connected as no culvert was identified under 256th Street (Photo 11). Therefore, these features would not be subject to fish habitat setbacks but are protected under the WSA.

Several unmapped streams were identified during the field assessment on the northwestern portion of the Site (shown on Figure 8). These streams, along with the mapped streams, flow west into a roadside drainage channel which is culverted in multiple locations, allowing flows to continue westward toward the Alouette River (Photos 29, 30). The streams flowing into the drainage channel were not considered fish passable due to the presence of steep slopes, waterfalls, and several impassible culverts (Photos 23, 25, 27, 28). Accordingly, Active Earth has assessed these tributaries as likely to be non-fish bearing. However, further assessments must be conducted by the landowner's qualified environmental professional (QEP) at such time as a development application is being considered.

Unmapped channelized streams were observed on the southwestern portion of the Site along Alouette Road. The streams likely receive flow from the unnamed Ridgeview GIS mapped watercourses which were dry during the field assessment. These streams were mapped as a complex of wetlands; however, no wetlands were identified in this area (Photos 15-17). Evidence of vernal pools were observed based on the height of moss growing above the base of tree trunks in the area (Photo 18). No wetland (hydrophytic) vegetation was observed, woody, non-wetland vegetation had established, and soils were dry. Therefore, this area displays features of an active floodplain as distinct from a wetland. Further assessment should be conducted in the wet season to determine fish presence or absence.

The stream field assessments for this assessment have been largely limited to preliminary overview assessments. Further site-specific survey efforts will be necessary to determine SPEA for proposed development and will be the responsibility of the development permit applicant.

6.2 Aquatic Habitat Descriptions

The Study Area is characterised by land sloping and draining southwestward and westward

to the Alouette River. Some of the watercourses within the Study Area can be categorized as ravine streams, with shallow headwater tributaries often including constructed drainage ditches.

Refer to Figure 8 for locations of streams in the Study Area.

6.2.1 Ravine Streams

The ravine streams and natural creeks within the Study Area generally flow to the west and to the south. The streams appear to have groundwater sources associated with a shallow aquifer and in some cases were culverted under roads or diverted along property lines, before reaching the steep ravines and discharging into the Alouette River. The Alouette River flows southwestward to the Pitt River. Details of the mapped streams within the Study Area can be found in the Table below.

TABLE - RAVINE STREAMS WITHIN THE STUDY AREA

Stream Name	General Location Within Study Area	Flows into	Recorded Fish Presence	Status
North Kanaka Creek/ Martin Creek	East, along Katonien Street	Kanaka Creek	Coho Salmon, Cutthroat trout	-
Badger Brook	Eastern, between Katonien Street and 256th Street		No Records	-
Websters Creek	South central, west of 256th Street		Cutthroat trout, Rainbow trout	The Athabasca River populations of Rainbow Trout are listed as endangered. Not applicable in the Study Area
Sawdust Creek	Central, along the east of 256th Street and north of BC Justice Institute		No Records	-
Unnamed Watercourse 1	South, between Websters Creek and Badger Brook		No Records	-
Gypsy Creek	Northwest of 142nd Avenue	Alouette River	No Records	-

Cooke Creek	West of 142nd Avenue, south of Gypsy Creek		No Records	-
Frodo Creek	West of 142nd Avenue, between Cooke Creek and Mud Creek		Brook trout, Cutthroat trout	-
Mud Creek	North of the Fraser Regional Correctional Centre and parallel to 142nd Street		No Records	-
Engels Creek	West of the Fraser Regional Correctional Centre		No Records	-
Dickens Creek			No Records	-
Doggett Creek			No Records	-
Chaplin Creek	East of Alouette Road, between the Alouette Correctional Centre for Women and the Fraser Regional Correctional Centre	No Connection	No Records	-
Bath Creek			No Records	-
Unnamed Watercourse 2	between 249th Street and 253A Street		No Records	-

The creeks present in the Study Area flow into the Alouette River or Kanaka Creek and all are essential sources of nutrients to fish populations. As most of these are fed by groundwater, these nutrient streams also export cool temperature waters at steady rates, providing a habitat in which salmonids need to survive.

Existing site-specific reports and mapping indicate the presence of salmonids in several streams (e.g. Frodo Creek). For this overview assessment, the existing fish classification mapping presented on Ridgeview GIS have been used to display SPEA boundaries on Figure 8, except where otherwise noted on the Streamside Setback Map.

7 TERRESTRIAL HABITATS

This component of the Environmental Assessment has assessed vegetation communities, wildlife, and wildlife habitat in the Study Area, including an assessment and suitability

mapping for rare and threatened species listed under the federal Species at Risk Act (SARA) and B.C. red- or blue-listed species. Environmentally sensitive areas have been identified (Figure 7), as well as wildlife habitat hubs, sites and corridors. Opportunities for wildlife corridors have been identified along riparian areas, as well as on the northern and southern portions of the Study Area. The BC Hydro Right of Way could also serves as a wildlife corridor.

7.1 Vegetation Overview

The Study Area is located within the Coastal Western Hemlock dry maritime sub-zone (CWHdm), as described by the Biogeoclimatic Ecosystem Classification (BEC) system developed for the Province of British Columbia. Coastal Western Hemlock dry maritime forests are typically dominated by Douglas fir (*Pseudotsuga menziesii*), western red cedar (*Thuja plicata*), and western hemlock (*Tsuga heterophylla*) with a shrub understory of salal (*Gaultheria shallon*) and red huckleberry (*Vaccinium parvifolium*) and less commonly vine maple (*Acer circinatum*), bracken fern (*Pteridium aquilinum*) and sword fern (*Polystichum munitum*).

The vegetation types identified within the Study Area are presented on the Vegetation Communities Map in Figure 6. A list of recorded vegetation within the Study Area is included in the Table that follows. No Ecosystems at Risk or Plant Species at Risk were recorded within the Study Area on the Conservation Data Centre. Additionally, no Ecosystems at Risk or Plant Species at Risk were observed during field reconnaissance in the Study Area.

The Vegetation Resource Inventory (VRI) forest cover database has been used to shown Coniferous Forest, Mixed Forest and Deciduous Forest as presented in Figure 6. The VRI polygons include detailed data on forest species composition and proportions of species dominance, age class and canopy density as well as other data. Field observations during the August 21,2025 field assessment determined that the mapped polygons accurately represent the forest communities present at the Site. The dominant tree species in each polygon has been used to show the coniferous, mixed forest and deciduous for types presented on Figure 6.

The VRI polygons that indicate stands dominated by Big-leaf Maple have been mapped with red dashed lines on Figure 6. A few observations of Big-leaf Maple trees and stinging nettle were observed throughout the Site within the proposed critical habitat for the Oregon Forestsnail. Further review of vegetation communities consisting of Big-leaf Maple dominant forest overlapping with the critical habitat polygons for the Oregon Forestsnail should be reviewed to determine the presence or absence of the biophysical habitat attributes required for Oregon Forestsnail during site-specific and project-specific environmental assessments by landowners and their QEP as development applications are being advanced.

Vegetation communities within the Study Area also can be broadly categorized as riparian, mature forest, young forest, wetland, and herbaceous. Many of the industrial lots within the Study Area have been partially or entirely cleared and paved or left bare.

Sensitive ecosystems have been identified in the Lower Mainland under the Metro Vancouver

Sensitive Ecosystems Inventory (SEI). Mapping of SEI within the Study Area is presented in Figure 7. The SEI mapping for the Study Area includes polygons for Mature forest (MF), Young Forest (YF) and Riparian Forest (RI). Refer to Figure 7 for additional details.

7.1.1 Riparian Forest

Within the Study Area, the Riparian Vegetation Type occurred along all watercourses to varying degrees. The most notable riparian areas remaining in the Study Area are on the ravine slopes alongside the Alouette River, along the western portion of the Study Area.

The Riparian Vegetation Type encountered in the Study Area typically comprises red alder (*Alnus rubra),* western red cedar, and big-leaf maple (*Acer macryphyllum*), with some black cottonwood *(Populus trichocarpa* spp. *trichocarpa*) and western hemlock. The understory layer consists primarily of salmonberry *(Rubus spectabilis*), Indian plum (*Oemleria cerasiformis*), red elderberry (*Sambucus racemosa*), and red huckleberry with some vine maple, beaked hazelnut (*Corylus cornuta*), Himalayan blackberry (*Rubus armeniacus*), English holly (*Ilex aquifolium*), English laurel (*Prunus laurocerasus*), Labrador tea (Rhododendron groenlandicum). The ground cover is primarily moss, sword fern, bracken fern, trailing blackberry (*Rubus ursinus*), Pacific bleeding heart (*Dicentra formosa*), deer fern (*Blechnum spicant*), yellow Lamium (Lamium galebdolon), sedges (*Carex* spp.), and some English Ivy (*Hedera helix*), licorice fern (*Polypodium glycyrrhiza*), Milfoil (*Myriophyllum* spp.), Field horsetail (*Equisetum arvense*), and skunk cabbage (*Lysichiton americanus*) at wetland areas.

The Riparian Vegetation Type is generally mapped as within the streamside setbacks (SPEA) along streams, lakes, ponds and wetlands as shown on Figure 8.

7.1.2 Wetlands

Wetlands were identified throughout the Site and were observed to contain hydrophytic vegetation. Vegetation included skunk cabbage (*Lysichiton americanus*), Field horsetail (*Equisetum arvense*), and sedges Carex (spp.).

7.1.3 Mature Forest

Much mature forest within the Study Area has been fragmented, due to prior development of industrial properties with parking lots and laydown yards. Mature forest is defined as a forest between the ages of 60 to 250 years. Stands of mature forest within the Study Area are found surrounding the riparian vegetation areas and east of the existing developments nearer to Blue Mountain. Mature forest in the northwest corner of the Study Area occurs within the boundary of Golden Ears Provincial Park (Figure 6), adjacent to an Old Growth Management Area. Old Growth forests are typically characterized by being greater than 250 years in age. Areas of mature forest generally fall within constrained areas identified on the constraints map (Figure 11). Areas of mature forest will likely be retained based on the constraints map as they fall within riparian setback areas, within Provincial Park boundaries, or along steep slopes identified on Blue Mountain.

Canopy species within the mature forest stands encountered in the Study Area are predominantly comprised of Douglas fir, big leaf maple (*Acer macrophyllum*), red alder, black cottonwood (*Populus balsamifera* ssp. *trichocarpa*), and western red cedar, with occasional western hemlock. Understory vegetation consists of vine maple, salal, hardhack (*Spiraea douglasii*), devil's club (*Oplopnanax horridus*), skunk cabbage, Indian plum, red elderberry, red huckleberry, salmonberry, blueberry (*Vaccinium* spp.), Dwarf Oregon grape (*Mahonia nervosa)* Himalayan blackberry, English holy, Scotch broom (*cytisus scoparius*), and ground cover is largely sword fern, lady fern (*Athyrium filix-femina*), licorice fern, bracken fern, spiny wood fern (*Dryopteris expansa*), and deer fern. Wildlife trees are often observed in these areas. Crown cover, which is defined as the proportion of ground area covered by the vertical projection of tree or woody vegetation crowns, is typically approximately 80% for these mature forest stands.

7.1.4 Young Forest

Young forest stands, which are typically less than 60 years old, are present within the Study Area and typically comprise red alders, black cottonwood (*Populus balsamifera* ssp. *trichocarpa*), big-leaf maple, western redcedar (*Thuja plicata*), and occasional western hemlock or Sitka spruce (*Picea sitchensis*). The understory is characterised by Indian plum, vine maple, salmonberry, and often Himalayan blackberry. The ground cover is typically sword fern, silver nettle (*Lamium maculatum*), Pacific bleeding heart, Robert's geranium (*Geranium robertianum*) and, occasionally, English ivy.

7.1.5 Invasive Species

Invasive species such as Himalayan blackberry, silver nettle, English holly, English ivy, Scotch broom, Yellow lamium and English laurel (*Prunus laurocerasus*) were regularly encountered at the edges of the forested areas, and within some younger forests. Japanese knotweed (*Reynoutria japonica*) was present along the mapped Class B stream on the northwest portion of the Site

TABLE - VEGETATION SPECIES REPORTED DURING FIELD SURVEYS, 2018-2025

Group	Common Name	Scientific Name	Status
Trees	Big-leaf maple	Acer macrophyllum	
	Bitter cherry	Prunus emarginata	
	Black cottonwood	Populus trichocarpa spp. trichocarpa	
	Douglas fir	Pseudotsuga menziesii	
	English oak	Quercus robur	Introduced
	Pacific crabapple	Malus fusca	
	Red alder	Alnus rubra	
	Sitka spruce	Picea sitchensis	
	Western hemlock	Tsuga heterophylla	
	Western red cedar	Thuja plicata	

Shrubs	Beaked hazelnut	Corylus cornuta	
	Blueberry	Vaccinium spp.	
	Buddleja	Buddleja spp.	Introduced
	Devil's club	Oplopnanax horridus	
	Dwarf Oregon grape	Mahonia nervosa	
	English holly	Ilex aquifolium	Introduced
	English ivy	Hedera helix	Introduced
	English laurel	Prunus laurocerasus	Introduced
	Evergreen blackberry	Rubus laciniatus	Introduced
	Hardhack	Spiraea douglasii	
	Himalayan blackberry	Rubus armeniacus	Introduced
	Indian plum (Osoberry)	Oemleria cerasiformis	
	Japanese knotweed	Polygonum cuspidatum	Introduced
	Labrador tea	Rhododendron groenlandicum	
	Red elderberry	Sambucus racemosa	
	Red huckleberry	Vaccinium parvifolium	
	Salal	Gaultheria shallon	
	Salmonberry	Rubus spectabilis	
	Scotch broom	Cytisus scoparius	Introduced
	Spurge laurel	Daphne laureola	Introduced
	Trailing blackberry	Rubus ursinus	
	Vine maple	Acer circinatum	
	Willow	Salix spp.	
Herbs	Bamboo	Bambusoideae spp.	
	Bunchberry	Cornus canadensis	
	Creeping buttercup	Ranunculus repens	Introduced
	Himalayan balsam	Impatiens glandulifera	Introduced
	Field horsetail	Equisetum arvense	
	Foamflower	Tiarella trifoliata	
	Giant horsetail	Equisetum telmatiea	
	Milfoil	Myriophyllum spp.	
	Pacific bleeding heart	Dicentra formosa	
	Periwinkle	Vinca spp.	Introduced
	Piggy-back plant	Tolmiea menziesii	
	Red-osier dogwood	Cornus stolonifera	
	Reed canary grass	Phalaris arundinacea	Introduced
	Robert's geranium	Geranium robertianum	Introduced
	Sedges	Carex spp.	
	Silver nettle	Lamium maculatum	Introduced
	Slough sedge	Carex obnupta	
	Stinging nettle	Urtica dioica	

	Western skunk cabbage	Lysichiton americanus	
	Yellow lamium	Lamium galeobdolon	Introduced
Ferns	Bracken fern	Pteridium aquilinum	
	Deer fern	Blechnum spicant	
	Lady fern	Athyrium filix-femina	
	Licorice fern	Polypodium glycyrrhiza	
	Spiny wood fern	Dryopteris expansa	
	Western Sword fern	Polystichum munitum	
Mosses	Mountain fern moss	Hylocomium splendens	
	Oregon beaked moss	Kindergbia oregana	

7.2 Wildlife Trees

A wildlife tree is any standing dead or living tree with special features that provides present or future critical habitats for the maintenance or enhancement of wildlife. There are nine classifications of coniferous and six classes of deciduous wildlife trees in various successions from live and healthy with no decay, to stumps and debris (Fenger *et al.* 2006). All of these wildlife tree stages provide important habitat and are known to support more than 90 animal species in British Columbia, including cavity nesting birds and mammals (Backhouse 1993). Some of the uses include nesting, feeding, territoriality (bear mark trees, bird singing sites, etc.), roosting, shelter, and overwintering (Backhouse 1993).

Most of the trees observed in the Study Area were identified as Class 1 wildlife trees. Class 1 wildlife trees are described as live healthy trees with no decay. Class 2 to 9 wildlife trees were also identified within the Study Area. Most of the decayed trees were situated within the riparian areas of watercourses.

7.3 Coarse Woody Debris

CWD is typically described as woody debris greater than 0.3 m in diameter. CWD provides important foraging, nesting, and cover components in the forested ecosystem for small mammals, amphibians, reptiles and invertebrates (Stevens 1997). Many insectivorous small mammals, birds, and black bears feed on insects found in decomposing woody material. CWD provides a safe, moist environment in which species such as salamanders and shrews can forage and seek shelter.

Good CWD cover was observed within most of the ravine riparian habitats within the Study Area, though CWD is absent where creeks pass through lawns or pasture. CWD cover within the forested blocks varied from moderate to good.

8 WILDLIFE INVENTORY AND HABITAT

Wildlife sign and activity was recorded throughout the Study Area during the field surveys on August 20 and 21, 2025 as well as in previous field research in the Study Area. All animal species detected during field surveys conducted by Active Earth and previous consultants are listed in the Table below.

Most of the treed portions within the study area provided potential breeding/roosting habitat for raptors, passerines, woodpeckers and a number of bat species. Songbirds and hummingbirds were observed flying, nesting, and feeding, in vegetation throughout the study area. Two nighthawks were observed flying overhead near Allco Park.

TABLE - WILDLIFE SPECIES REPORTED DURING FIELD SURVEYS, 2018-2025

Group	Common Name	Scientific Name	Status
Songbirds	American Robin	*Turdus migratorius*	BC, Yellow
	Black-capped Chickadee	*Poecile atricapillus*	BC, Yellow
	Brown Creeper	*Certhia americana*	BC, Yellow
	Cedar waxwing	*Bombycilla cedrorum*	BC, Yellow
	Chestnut-backed Chickadee	*Poecile rufescens*	BC, Yellow
	Common Nighthawk	*Chordeiles minor*	SARA, Special concern
	Common Raven	*Corvus corax*	BC, Yellow
	Dark-eyed Junco	*Junco hyemalis*	BC, Yellow
	European Starling	*Sturnus vulgaris*	Introduced
	Fox Sparrow	*Passerella iliaca*	BC, Yellow
	Golden-crowned Kinglet	*Regulus satrapa*	BC, Yellow
	Red crossbill	*Loxia curvirostra*	SARA, Threatened
	Goldfinch	*Spinus tristis*	BC, Yellow
	House Sparrow	*Passer domesticus*	Introduced
	Northwestern Crow	*Corvus caurinus*	BC, Yellow
	Pacific Wren	Troglodytes pacificus	BC, Yellow
	Ruby-crowned Kinglet	*Regulus calendula*	BC, Yellow
	Song Sparrow	*Melospiza melodia*	BC, Yellow
	Spotted Towhee	*Pipilo maculatus*	BC, Yellow

Group	Common Name	Scientific Name	Status
	Stellar's Jay	*Cyanocitta stelleri*	BC, Yellow
	Tree Swallow	*Tachycineta bicolor*	BC, Yellow
	Varied Thrush	*Ixoreus naevius*	BC, Yellow
Woodpeckers	Hairy Woodpecker	*Leuconotopicus villosus*	BC, Yellow
	Downy Woodpecker	*Dryobates*	BC, Yellow
	Northern Flicker	*Colaptes auratus*	BC, Yellow
	Pileated Woodpecker	*Dryocopus pileatus*	BC, Yellow
	Red-breasted Sapsucker	*Sphyrapicus ruber*	BC, Yellow
Hummingbirds	Anna's Hummingbird	*Calpyte anna*	-
Raptors	American Kestrel	*Falco sparverius*	BC, Yellow
	Bald Eagle	*Haliaeetus leucocephalus*	BC, Yellow
	Northern Pygmy Owl	*Glaucidium gnoma*	BC, Yellow
	Red-tailed Hawk	*Buteo jamaicensis*	BC, Yellow
Mammals	Black-tailed Deer (tracks and scat)	*Odocoileus hemionus columbianus*	BC, Yellow
	Black Bear (tracks)	*Ursus americanus*	BC, Yellow
	Coyote (tracks)	*Canis latrans*	BC, Yellow
	Cow (feral)	*Bos taurus*	Introduced
Amphibians	Pacific Tree Frog	*Pseudacris regilla*	BC, Yellow
	Northwestern Salamander (eggs)	*Ambystoma gracile*	BC, Yellow
Invertebrates	Northwest Hesperian	*Vespericola Theridiidaecolumbiana*	BC, Yellow
	Cobb spider	*Theridiidae Columbiana*	-
	Pacific Banana Slug	*Ariolimax columbianus*	BC List, Yellow
	Paper Wasp (nest)	*Vespidae* spp.	-
	Water Striders	*Gerridae*	-

8.1 Wildlife Species of Conservation Concern

Wildlife species of conservation concern (i.e. provincially and/or federally listed species at

risk) with potential to occur within the Study Area are discussed below. No aquatic species at risk were recorded on the Departmen of Fisheries and Oceans aquatic species at risk map within the Study Area.

8.1.1 BC Conservation Data Centre (CDC) & BC Species & Ecosystems Explorer

The Conservation Data Centre (CDC) iMap feature showed mapped occurrences of species at risk in and around the Study Area.

Active Earth has reviewed the Ministry of Environment (MOE) Conservation Data Centre (CDC) database of known and potential occurrences of provincially listed (i.e., red-listed or blue-listed) plant and animal species, federally listed species from Schedule 1 of the Species at Risk Act (SARA) and from the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) candidate list. For this Study Area, a search was completed on August 18, 2025, using Habitat Wizard and BC Conservation Data Center.

An additional search was completed on September 24, 2025, of the BC Species & Ecosystems Explorer webpage for the Study Area. The search generated 133 results for species at risk with potential to occur within the Study Area. Most of the species were considered unlikely to occur and were not discussed further. The Table below lists species and their potential to occur.

TABLE – SPECIES AT RISK AND THEIR POTENTIAL TO OCCUR WITHIN THE STUDY AREA

Scientific Name	English Name	Provincial Status	SARA Status	Probability	Rationale
Mammals					
Aplodontia rufa	Mountain Beaver	Blue	1-SC (2003)	Nil	Does not occur north of the Fraser River
Lasiurus cinereus	Hoary Bat	Blue		High	**Likely** - Potential use of openings in bark in conifer trees as hibernacula. Wetlands and riparian areas provide suitable foraging habitat.
Myotis lucifugus	Little Brown Myotis	Blue	1-E (2014)	Moderate	**Likely** - Potential use of buildings and openings under bark in conifer trees as hibernacula. Wetlands and riparian areas provide suitable foraging habitat.
Myotis yumanensis	Yuma Myotis	Blue		Moderate	**Likely** - Potential use of buildings and openings under bark in conifer trees as hibernacula. Wetlands and riparian areas provide suitable foraging habitat.
Corynorhinus townsendii	Townsend's Big-eared Bat	Blue		Low	**Potential** - Broad range of habitats in Southern Interior; few records from Lower Mainland. Uses caves, old mines and buildings as summer day and night roosts, with buildings being used more often in humid coastal areas.
Lepus americanus washingtonii	Snowshoe Hare,	Red		Low	**Potential** - Coquitlam is the nearest record north of the Fraser River. There are six

	washingtonii subspecies				extant occurrences known and mapped at present (2023) by the BCCDC.
Scapanus townsendii	Townsend's Mole	Red	1-E (2005)	Nil	Only occurs in Sumas Prairie and Sumas Mountain
Sorex trowbridgii	Trowbridge's Shrew	Blue		Moderate	**Likely** – In the US Pacific Northwest it is the most common small mammal in Douglas-fir forests. Similarly, it is abundant in the lower Fraser River valley of British Columbia.
Sorex rohweri	Olympic Shrew	Red		-	Unknown, data deficient species.
Sorex bendirii	Pacific Water Shrew	Red	1-E (2016)	Moderate	**Potential** –Typically associated with riparian areas around and including a permanent stream or creek (<10 m wide). Wetlands and connected watercourses may provide habitat.
Neogale frenata altifrontalis	Long-tailed weasel, *altifrontalis* subspecies	Red		Low	**Unlikely -** The last collection was made at Vedder Crossing in 1937. There are other historical specimen records from Vedder Crossing, Cultus Lake, Lihumitson Park and Chilliwack
Birds					
Aechmophorus occidentalis	Western Grebe	Red	1-SC (2017)	Nil	Nests only in the Shuswap and Kootenay's in BC. Can be observed during migration.
Ardea herodias fannini	Great Blue Heron, *fannini* subspecies	Blue	1-SC (2010)	Moderate	**Likely -** Forage in freshwater habitats, as well as grasslands and agricultural fields, where they stalk frogs and small mammals. Forested areas associated with wetlands provide suitable nesting habitat.
Asio flammeus	Short-eared Owl	Blue	1-SC (2012)	Nil	Only winters in the Lower Mainland. Prefers open fallow fields.
Botaurus lentiginosus	American Bittern	Blue		Nil	No records for Maple Ridge. Breeding birds typically inhabit relatively large wetlands (>4 ha), and wetland size may limit abundance in a given region.
Brachyramphus marmoratus	Marbled Murrelet	Blue	1T (2003)	Low	**Potential** – Critical Habitat overlaps over portions of the study area. No records for Maple Ridge.
Buteo lagopus	Rough-legged Hawk	Blue		Nil	No records for Maple Ridge. Only winters in the Lower Mainland and observed during migration. Prefers open fields.
Butorides virescens	Green Heron	Blue		Nil	No records for Maple Ridge. Breeding birds typically inhabit relatively large wetlands (>4 ha), and wetland size may limit abundance in a given region.
Coccothraustes vespertinus	Evening Grosbeak	Yellow	1-SC (2019)	Moderate	**Potential** – Commonly observed during migration. Breeds mainly throughout the southern and central interior of BC. No nest records for Maple Ridge. Closest suspected nest record at Rolley Lake Provincial Park.

Contopus cooperi	Olive-sided Flycatcher	Yellow	1-SC (2023)	Low	**Potentia**l - Most often associated with open areas containing tall live trees or snags for perching. Usually nests in conifers. Suspected to nest in the Lower Mainland.
Cypseloides niger	Black Swift	Blue	1-E (2019)	Low	**Unlikely -** Possible foraging. Nesting unlikely (prefers cliffs/ waterfalls/ caves).
Eremophila alpestris strigata	Horned Lark, *strigata* subspecies	Red	1-E (2005)	Nil	No records for Maple Ridge. A few birds may persist in the lower Fraser Valley at YVR, near Abbotsford, and near Chilliwack (Campbell et al. 1997). The last confirmed breeding record was 1978.
Euphagus carolinus	Rusty Blackbird	Blue	1-SC (2009)	Nil	Distributed across the plateaus and wetland basins of central and northern BC east of the Coast Mountains. Observed only on migration. No nest records for the Lower Mainland.
Falco rusticolus	Gyrfalcon	Blue		Nil	Only overwinters in the Lower Mainland. Breeding records occur in northwestern BC.
Hirundo rustica	Barn Swallow	Yellow	1-T (2017)	Moderate	**Potential -** Foraging habitat in the immediate area. Nesting unlikely (prefers old barn structures/cliffs/ waterfalls/ caves).
Hydroprogne caspia	Caspian Tern	Blue		Nil	Only one nest record for BC (1984) at Roberts Bank.
Limnodromus griseus	Short-billed Dowitcher	Red		Nil	No Lower Mainland nest records. Only known to nest in northwestern BC
Megascops kennicottii kennicottii	Western Screech-Owl, *kennicottii* subspecies	Blue	1-T (2005)	Low	**Potential** – No records for Maple Ridge. Primarily prefers mature coniferous and mixed riparian forest habitat. May use the riparian habitat along large watercourses and wetlands. Fairly tolerant of people and may be found in suburbs or parks. No nest records occur with the study area.
Nannopterum auritum	Double-crested Cormorant	Blue		Nil	Nest restricted to the Salish Sea.
Nycticorax nycticorax	Black-crowned Night-Heron	Red		Nil	Only two breeding records for BC, both from Reifel Migratory Bird Sanctuary on Westham Island
Patagioenas fasciata	Band-tailed Pigeon	Blue	1-SC (2011)	Moderate	**Potential** - Associated with conifer and mixed deciduous forests with an understorey of fruiting shrubs,
Recurvirostra americana	American Avocet	Blue		Nil	Rare in BC. Sporadic breeding records for the Okanagan, Cariboo, Kootenay's and Peace River.
Strix occidentalis caurina	Northern Spotted Owl	Red	1-E (2003)	Low	**Potential** – Critical Habitat overlaps over portions of the study area. Last detected in Maple Ridge <20 years ago.

Tyto furcata	American Barn Owl	Blue	1-T (2018)	Low	**Potential** – Open area may provide potential hunting sites. Utilizes abandoned buildings in near vicinity for nesting.
Amphibians					
Ascaphus truei	Coastal Tailed Frog	Yellow	1-SC (2003)	Low	**Potential** - Found in clear, cold swift-moving mountain streams with coarse substrates. Primarily in older forest sites. Limited occurrence of streams with suitable habitat within the study area.
Anaxyrus boreas	Western Toad	Yellow	1-SC (2018)	Moderate	**Likely** – No records for Maple Ridge but study area is within known range. Breed in a variety of natural and artificial aquatic habitats, with or without tree or canopy cover, coarse woody debris, or emergent vegetation May use shallow ponds and temporary standing water within the study area for egg laying.
Dicamptodon tenebrosus	Coastal Giant Salamander	Blue	1-T (2003)	Nil	Only occurs within the Chilliwack Valley, Bridal Falls and Cultus Lake areas
Reptiles					
Chrysemys picta pop. 1	Painted Turtle - Pacific Coast Population	Red	1-T (2021)	Nil	No known records within the study area. Nearest record at Whonnock Lake.
Invertebrates					
Allogona townsendiana	Oregon Forestsnail	Red	1-E (2005)	High	**Likely** – Critical Habitat overlaps portions of the study area. Found in deciduous forests, typically dominated by bigleaf maple with stinging nettle. Requires coarse woody debris, copious amounts of leaf litter, and both living and senescent vegetation.
Argia emma	Emma's Dancer	Blue		Low	**Potential** - Nearest records along Stave River. Common at scattered localities along rivers, creeks and sometimes, wave-washed lake beaches.
Argia vivida	Vivid Dancer	Blue	1-SC (2019)	Nil	Rare in BC. Associated with cool or hot springs. No records for Maple Ridge.
Argynnis zerene bremnerii	Zerene Fritillary, *bremnerii* subspecies	Red		Nil	Restricted to Vancouver Island.
Callophrys johnsoni	Johnson's Hairstreak	Red		Low	**Potentia**l – Nearest record in the Silver valley (1990). Mistletoe of western hemlock is the larval plant.
Carychium occidentale	Western Thorn	Blue		Low	Nearest record in Sardis. Associated with deciduous and mixed wood forests. Bigleaf maples are usually present. Colonies are found sporadically in deep litter areas, and nearly always in moist hollows, near seeps or along riparian zones.

Cicindela hirticollis	Hairy-necked Tiger Beetle	Blue		Nil	Only Lower Mainland record occurs along the Fraser River in Chilliwack. Inhabits the sandy edges extensive rivers, lakes, and ocean.
Danaus plexippus	Monarch	Red	1-E (2023)	Nil	No records occur in Maple Ridge. Infrequently observed in the Lower Fraser Valley. Last detected in Fraser Valley in 20016. Milkweed is their larval plant which is considered a noxious weed.
Erynnis propertius	Propertius Duskywing	Red		Nil	Associated with Garry Oak. All Fraser Valley records are associated with Garry oak on Sumas Mountain and one record from Ryder Lake in 2016.
Cercyonis pegala incana	Common Wood-nymph, *incana* subspecies	Red		Nil	Only found along coastal areas of Vancouver Island and Sunshine Coast along the Salish Sea.
Chlosyne hoffmanni	Hoffmann's Checkerspot	Red		Nil	Only known from the Cascade Mountains in Manning Provincial Park.
Euphyes vestris	Dun Skipper	Blue	1-T (2003)	Low	**Potential** - No records for Maple Ridge. Only known foodplant is the sedge *Cyperus esculentus*.
Octogomphus specularis	Grappletail	Blue		Low	**Potential** - No records for Maple Ridge. Lives along wooded streams draining lakes. Nearest record at Rolley Lake Provincial Park.
Parnassius clodius claudianus	Clodius Parnassian, *claudianus* subspecies	Blue		Moderate	**Likely** - Records occur for Maple Ridge. BC coast the larval foodplant is Pacific bleeding heart
Sympetrum vicinum	Autumn Meadowhawk	Blue		Moderate	**Likely** – Nearest record at Whonnock Lake. Lives in ponds, slow streams and lakes with dense emergent vegetation.

The seven species with mapped or observed occurrence near the Study Area or with critical habitat within the Study Area include: Oregon Forestsnail (*Allogona townsendiana*), Northern Red-legged Frog (*Rana aurora*), Pacific Water Shrew (*Sorex bendirii*), Marbled Murrelet (*Brachyramphus marmoratus*), Spotted owl (*Strix occidentalis*), Barn owl (*Tyto alba*), and Common nighthawk (*Chordeiles minor*). These species are listed and briefly discussed below:

TABLE – SPECIES AT RISK WITH CRITICAL HABITAT OR CONFIRMED PRESENCE NEAR THE STUDY AREA

Common Name	Scientific Name	Status
Northern Red-legged Frog	Rana aurora	SARA-special concern. BC-Blue
Oregon Forestsnail	Allogona townsendiana	SARA- endangered. BC - Red

Common Name	Scientific Name	Status
Pacific Water Shrew	Sorex bendirii	SARA- endangered. BC - Red
Common Nighthawk	Chordeiles minor	SARA – special concern. BC- Blue
Barn Owl	Tyto alba	SARA – threatened. BC - Blue
Marbled Murrelet	Brachyramphus marmoratus	SARA – threatened. BC - Blue
Spotted Owl	Strix occidentalis	SARA – Endangered BC - Red

8.1.2 Northern Red-legged Frog

Two reports of the provincially Red-listed Northern reg-legged frog (*Rana aurora*) were identified: one approximately 2 km southeast of the Study Area near the base of the Blue Mountain FSR, and a second observation reported 2km from the western boundary of the Study Area in the Mike Lake area within Golden Ears Provincial Park. Northern red-legged frogs in BC are found in moist forests and in forested wetlands (Corkran and Thoms 1996). Adults will often wander far from standing water to forage on small insects or forest invertebrates (Nussbaum et al. 1983 in Ovaska and Sopuck 2004). Generally, they breed in cool, shaded temporary ponds where they attach their eggs to submerged woody debris or vegetation (Corkran and Thoms 1996). Critical habitats for the red-legged frog would include all temporary and permanent breeding ponds. CWD would also be considered a critical habitat element for cover and foraging. No northern red-legged frogs were detected during the field surveys. The small wetlands, springs, and side-channel pools in ravine streams within the Study Area provide suitable breeding habitat for red-legged frog.

8.1.3 Oregon Forestsnail

The provincially Red-listed Oregon Forestsnail (*Allogona_townsendiana*) was reported at a location located approximately 550m west of the Study Area and is considered likely to occur within the study area. This large snail species is found from western Oregon and Washington states and northwards into southwestern BC. The Oregon Forestsnail occupies older mixed-wood and deciduous lowland forests, typically dominated by big-leaf maple and stinging nettle. Habitat requirements generally include some woody debris, a generous amount of leaf litter, and both living and dying vegetation. These conditions help prevent the loss of moisture and extreme fluctuations in temperature that are thought to be particularly detrimental to hibernating snails. No Oregon Forestsnail were detected within the Study Area, but they have been observed previously approximately 550m west of the study area. Forested areas within

the Study Area contain big-leaf maple and stinging nettle that could provide potential habitat for Oregon Forestsnail.

8.1.4 Pacific Water Shrew

The provincially Red-listed Pacific Water Shrew (Sorex bendirii) was reported in October 2011 towards the northwest corner of the Study Area. The occurrence is located within the 30m setback of the Alouette River. Pacific water shrews are usually associated with riparian areas (Nagorsen 1996; Craig 2003). Past studies have reported that the majority of Pacific water shrews were captured within 25 m of streams in moist forests, though they have been found up to 1 km from water (Pattie 1973 in Craig 2003). Their home range is considered to be 400 m along a waterbody (Craig 2003). In British Columbia, capture sites appear to be primarily associated with coniferous or deciduous forest located close to water. Habitat components usually found at Pacific water shrew sites include the presence of red alder, bigleaf maple, western hemlock or western redcedar that border streams and skunk cabbage marshes (Nagorsen 1996). In addition, Pacific water shrews have also been captured in more open habitat, with dense marsh vegetation. CWD also seems to be an important habitat component. The presence of moist habitat appears to be more important than forest age (Craig 2003).

No Pacific water shrews were detected during the field surveys. However, the riparian habitats along the creeks within the Study Area do provide suitable habitat for Pacific water shrews.

8.1.5 Common Nighthawk

The Common nighthawk breeding habitat includes open areas with limited vegetation (ECCC, 2018b). This includes sand dunes, beaches, logged areas, forest clearings, pastures, peatbogs, and rocky outcrops. There is potential for this habitat around the quarry, in areas that are unactive. Two common nighthawks were observed flying overhead during the field assessment on August 21, 2025.

8.1.6 Barn Owl

The Barn Owl has low potential to occur as the preferred habitat includes open fields that provide suitable feeding habitat (ECCC, 2021). No suitable nesting structures (trees with suitable cavities or storage building/barn structures) were observed within the Site.

8.1.7 Marbled Murrelet

The Marbled Murrelet critical habitat polygon overlaps with the study area. There is low potential for Marbled murrelet nesting habitat due to the lack of key habitat attributes such as nest trees greater than 30 meters tall and sufficient platform diameter to provide a nest site and landing pad (ECCC, 2007). Further assessment of key habitat attributes should be conducted if any development is proposed within areas of mature forest (such as the old growth management area) or within the critical habitat polygon for the Marbled Murrelet.

8.1.8 Spotted Owl

Spotted owl habitat typically includes mixed coniferous forests with un-even aged, multilayered canopy that includes large trees with broken tops, deformed limbs, large cavities, and numerous large snags and accumulations of logs and downed woody debris (ECCC, 2018a). Spotted owl habitat is likely present within the Study Area based on the vegetation communities present, however, there is low potential for presence of the Spotted owl within the study area. Further assessment should be undertaken to determine the presence of suitable habitat, particularly if any development is proposed near the old growth management area and proposed critical habitat polygon. Retention of mature and mixed forests should be prioritized where possible.

8.2 Species at Risk Critical Habitat

There are numerous mapped Critical Habitat area designations or polygons within the Study Area. The critical habitat for the Marbled Murrelet has been finalized through the CDC, while the other critical habitat polygons are current proposed critical habitat area designations. These include critical habitats for Pacific Water Shrew (PWS), Spotted Owl (SPOW), Oregon Forestsnail (OFS) within the Study Area, and Barn Owl critical habitat to the south of the Study Area in agricultural areas. Refer to Figure 9 for detailed reference of critical habitat polygons mapped in and nearby the Study Area.

The mapped species at risk critical habitat polygons cover extensive areas within the Study Area. However, as shown on Figure 9, some of the mapped polygons (Oregon Forestsnail, Spotted Owl) cover areas of existing gravel extraction or facilities such as the Alouette Correctional Centre for Women. The presence of mapped polygons for species at risk are not finalized or up-to-date but serve to indicate the need for site-specific, project-specific assessments for development applications by QEP to determine if the biophysical and habitat requirements of a designated species at risk are present within the development application area. In the example of Oregon Forestsnail, this species biophysical habitat requirements include the presence of both Big-leaf Maple trees and stinging nettle. The forest stands dominated by Big-leaf Maple are outlined in red-dashed lines on the Species at Risk Critical Habitat Map (Figure 9), which indicates that the Oregon Forestsnail mapped polygon is outside of areas with abundant Big-leaf Maple trees. However, Oregon Forestsnail can be present in small "micro-habitats" within coniferous forest stands, so site-specific and project-specific QEP assessments are needed in advance of future development activities or applications.

In general, under the provincial Wildlife Act, all native wildlife species listed in the Act are protected. Under the Federal Species at Risk Act (SARA), all listed wildlife, vegetation species and their legislated Critical Habitats (CH) are protected on federal lands and all listed aquatic and birds species and their legislated Critical Habitats are protected on all lands. Although the SARA protects all listed species and their legislated Critical Habitats on Federal lands, the Accord for the Protection of Species at Risk (1996) and the Canada-British Columbia Agreement

on Species at Risk (2005) gives the province and local governments the first opportunity to prevent the up-listing of any species listed in the Act. If local governments do not prevent the up-listing of a species, then the Minister of Environment may order that the provisions of Sections 32 and 33 of the SARA apply to the species of concern.

The OFS, PWS and SPOW critical habitat polygons are 'proposed' at this time and as the critical habitat isn't finalized, there is no trigger to protect critical habitat on private land. Any individual of a species listed under the SARA is protected regardless of land status. A SARA permit is required to salvage any listed species on Federal lands. On non-federal lands, permits for PWS are applied through the province (General Wildlife Permit) and no permit is required to salvage OFS on non-federal lands.

9 ENVIRONMENTALLY SENSITIVE AREAS

Several environmentally sensitive areas (ESAs) are present in the Study Area, and enhancement to riparian and forested areas during the development process can provide yet more environmental value (e.g. replanting native vegetation, removal of invasive species). The ESAs identified in the Study Area include watercourses, wetlands, riparian habitats, and mature and forest stands. Protection for these features may often overlap, and setback areas might also provide wildlife corridors across the Study Area.

Sensitive ecosystems have been identified in the Lower Mainland under the Metro Vancouver Sensitive Ecosystems Inventory (SEI). Mapping of SEI within the Study Area is presented in Figure 7.

9.1 Watercourses and Riparian Habitats

The priority areas for protection include the fish-bearing and non-fish-bearing creeks including their surrounding riparian areas. Watercourses and their riparian areas in the City are currently protected by the WPDP guidelines. Under this guideline, setbacks for streams range from 15-30 metres from the stream top of bank mark or from the top of ravine (where slopes are steeper than 3:1). Protection of the watercourses and the riparian areas will provide habitat for amphibians and potential habitat to several protected species likely to exist in the general area. It will also protect and moderate the nutrient and water flows into valuable fish habitat in the Alouette River, and can provide corridors for movement of wildlife through the Study Area.

9.2 Wetlands

Numerous wetlands were identified throughout the Study Area and are protected under the Water Sustainability Act. Wetlands that are connected via surface water to fish habitat are also protected under the Riparian Areas Protection Regulation. Protection of wetlands will provide habitat for amphibians including protected species such as the Northern Red-legged Frog.

9.3 Forest Stands

Mature forest stands located in the Study Area should be protected for the valuable habitat they provide for resident and migrant wildlife to the extent possible, especially within designated Critical Habitat polygons for Species at Risk. Some forest stands are protected under the Tree Protection and Management Bylaw under the definition of Significant Trees. This definition encompasses large individual trees. Individual trees that contain raptor nests are protected under the BC Wildlife Act, and guidelines recommend protection of forest stands to avoid damage to the nest. Protection of forest strands to avoid damage to the nest can range from:

10 - 50 metres or more for songbirds and other small bird nests

50 metres or more for swallow colonies

100 to 200 metres for a pileated woodpecker

500 metres or more for a Northern Goshawk

9.4 Interior Forest Habitat

Interior forests habitat are areas beyond the microclimatic and biotic effects of forest edges. Given that microclimatic edge effects extend 200 metres or more from the forest edge, no interior forest habitats are present in the Study Area. Interior forests provide stable environmental conditions that are required for certain plant and animal communities. This habitat type can occur in any forest type of any age, however, as development continues, and large forested areas become fragmented, the quality and quantity of interior forest habitat decreases (Bannerman 1998).

10 CONCLUSIONS

The Study Area for the North 256 Street Industrial Lands Area Plan Study Area comprises a gross area of approximately 743 ha and is located south of Alouette Lake, partially within the Alouette Valley, and north of the Maple Ridge community Webster's Corner. The Site is bound by the Alouette River to the West. The Study Area generally slopes to the southwest at an average grade of 5 percent and contains numerous tributaries to the Aloutte River and North Kanaka Creek within the Study Area. The Study Area is characterized by rural industrial and institutional properties with large acreages, many of which containing second- or third-growth forest, while others have paved or bare land. Several creeks are fed by groundwater and flow across the Study Area to the west and south into the Alouette River and Kanaka Creek.

Much of the Study Area is underlain by proglacial sand and gravel deposits belonging to the Vashon Drift. These are overlain by glaciofluvial channel fill, floodplain, and ice-contact gravel and sand deposits from the Fort Langley Formation (FLb) in the Alouette River floodplain. These host provincially-mapped Aquifer No. 38, a moderately productive aquifer that transitions from unconfined to confined moving downstream along the Alouette River valley

adjacent to the Study Area. Along the same transect, the Alouette River level approaches the groundwater to become hydraulically connected.

As ground elevations step upward towards Blue Mountain, the Vashon Drift deposits become thinner and are interrupted in places by outcropping bedrock. On the face of the westernmost step which parallels the Alouette River, the exposed upper water table (not the same as that beneath the River floodplain) sustains several spring-fed tributaries. These contribute baseflow to the River via these watercourses. Along the southern edge of the Vashon Drift, groundwater discharge and surface water runoff report to Websters Creek and its tributaries and shallow water table conditions prevail. In the northern portion of the Study Area, depths to groundwater have not been verified, but are expected to be relatively shallow given the presence of ponds and wetlands.

A portion of watercourses within the Study Area do not appear to be fish-bearing due to permanent barriers to fish migration downstream of the Study Area, entailing waterfalls, steep ravine reaches, and impassable culverts observed by Active Earth. However, there are potential resident fish present between fish migration barriers. Although groundwater inputs support these watercourses and provide flows year-round, these streams are unlikely to contain resident populations of fish. Additionally, some of the watercourses observed at the end of summer were dry which eliminates the potential for resident fish to persist within those dried channel reaches of the creek. However, the importance of these creeks in providing fish habitat should not be understated, given the role of groundwater inputs in maintaining habitable (cool) temperatures, steady flows, and considerable nutrient content to fish habitat such as Frodo Creek, Webster Creek, the Alouette River, and Kanaka Creek.

Vegetation in the Study Area is predominantly associated with riparian areas surrounding the tributaries, with mature forest present across the Study Area. Non-riparian vegetation comprises young to old forest stands, which are fragmented by roads, and industrial and institutional buildings. The Site was dominated by coniferous forest however areas dominated by Big-leaf Maple trees and other deciduous species are also present.

Invasive vegetation is present across the Study Area, along the borders of forest stands and riparian areas, along roadsides, and within young forests. Himalayan blackberry was widespread at forest edges, drainage ditches, and within young forest. Japanese knotweed (*Reynoutria japonica*) was present along the mapped Class B stream on the northwest portion of the Site. *Lamium*, English holly, English ivy, Himalayan Balsam, and English laurel were also frequently encountered.

Several species of conservation concern (i.e. provincially and/or federally listed species at risk) have potential to occur within the Study Area. The Common nighthawk was observed flying overhead, however, no other species at risk were observed within the Study Area during the field surveys. Although no other species at risk were observed during field reconnaissance there is still potential for some species to occur, as discussed in Section 7. The potential to occur is based on records of observations nearby the Study Area and/or suitable or critical habitat

being present in the Study Area. Several species of conservation concern are expected to inhabit mature riparian areas such as the Pacific Water Shrew, Northern Red-legged Frog, and Oregon Forestsnail. Therefore, riparian habitats may potentially contain species of conservation concern. In particular, where Oregon Forestsnail critical habitat overlaps with Big-leaf Maple-dominated vegetation, further assessment is recommended to identify the presence of stinging nettle, as these microhabitats have a high likelihood of supporting the species. Other habitat types that may support species at risk include mature forests and open areas with sparse vegetation.

There are numerous constraints on development within the Study Area such as steep slopes, streamside setback areas, flood prone areas, designated critical habitat polygons for species at risk, Agricultural Land Reserve, existing developed institutional uses, and others. The Development Constraints Map (Figure 11) presents various development constraints identified through this baseline Environmental and Hydrogeological Overview Assessment. However, it should be noted that the boundaries of several mapped constraints such as streamside setback areas and critical habitat polygons are subject to refinement through detailed site-specific environmental assessment that must be conducted at such time as a development proposal is being considered. The City's development permit processes require detailed site-specific and project-specific assessments for review and approval of development proposals.

There are also opportunities for industrial land development within the Study Area. Opportunities may include expansion of existing industrial sites, conversion of certain industrial operations (e.g. gravel quarries) to industrial buildings or other industrial uses, use of parts of the BC Hydro right-of-way adjacent to industrial operations for parking or equipment storage (subject to BC Hydro approval), and others as shown on Figure 12: Opportunities Map. Areas of development proposals known to the City are also shown on Figure 12.

11 RECOMMENDATIONS

Active Earth recommends that further assessments be conducted in areas of proposed development to confirm the extents of unmapped watercourses and their classifications. The potential to remove existing introduced barriers to fish migration (i.e. culverts) should be assessed and implemented in conjunction with any future re-development applications.

Land use planning in the area should consider the need to maintain groundwater recharge capability by minimizing impervious ground surfaces, maintaining and enhancing areas of vegetated ground, and incorporating infiltration structures (e.g. open drainage ditches retained, bioswales, rock pits). Infiltration is expected to be most practical in the central portion of the Study Area currently occupied by a large gravel pit. Areas where infiltration is expected to be limited, due to a shallow water table, poorly draining soils and sediments, shallow bedrock, or proximity to steep slopes are outlined on Figure 11, Development Constraints Map. Here, additional engineering controls will be necessary to moderate erosion and sedimentation in receiving watercourses, particularly in the face of a changing climate. All geotechnical

investigations for land development proposals should include a robust plan for assessing local groundwater conditions (e.g. including multiple monitoring wells).

Local Aquifer No. 38 offers great potential as a future water source along the Alouette River Floodplain. Any groundwater extraction from below the floodplain near the southeast portion of the Study Area will need to take into consideration the likely hydraulic connection between the Aquifer and the River. On the middle 'bench' at higher elevations, potential impacts on spring-fed tributaries, particularly those that are licensed, warrants careful consideration.

Maintenance of the groundwater baseflows of creeks within the Study Area is essential for moderating the temperature, water, and nutrient flows into the Alouette River and Kanaka Creek. Groundwater-fed nutrient streams, such as the creeks present in the Study Area, supply cool water at a steady rate. In contrast, runoff from developed areas typically enters streams with extremes of temperature and flow, which is damaging to fish populations, other wildlife and vegetation, and causes increased erosion. Increases in temperature extremes as the climate changes further emphasizes the importance of these moderating effects of groundwater-fed nutrient streams. Although many of the groundwater seepages identified in the Study Area are associated with streams and therefore will be protected within setbacks, a number of seepage areas exist that are diverted into drainage ditches (i.e. groundwater discharge). Active Earth recommends that these groundwater flows are protected and retained as groundwater base flows, to protect the sensitive habitat and avoid harming the fish populations.

To minimize negative impacts of future development on groundwater, as well as the hydrologic flow regime of watercourses, mitigation methods should be considered as part of the development process. Low Impact Development (LID) land planning and design approaches aim to manage stormwater runoff and generally preserve the pre-development hydrologic regime. LID methods incorporated into development plans can increase the effective infiltration of stormwater to reduce excessive creek flow during storm events as well as increase groundwater recharge. LID practices will help to mitigate upland creek erosion and lowland flooding issues associated with urban storm flow.

In addition to the riparian areas that will be protected due to their proximity to watercourses across the Study Area, protecting and enhancing vegetation in key areas within the Study Area will maintain habitat for species of conservation concern. Active Earth recommends protecting areas of steep slopes and mature forest. Additionally, areas where Oregon Forestsnail critical habitat overlaps with Big-leaf Maple-dominated vegetation should be further assessed for the presence of stinging nettle, as these microhabitats have a high likelihood of supporting the Oregon Forestsnail.

Invasive vegetation species were regularly encountered along interfaces of forested and disturbed or developed sites, and within the young forest stands within the Study Area. These invasive species primarily included Himalayan blackberry, Japanese knotweed, English holly, *Lamium* and English ivy. Removal of these invasive plant species will benefit many native

wildlife and vegetation species and improve existing wildlife and ecosystem corridors. Active Earth recommends removal of Japanese knotweed along the mapped Class B stream on the northwest portion of the Study Area, and assessment and implementation of invasive species management plans in conjunction with any future re-development applications, with an emphasis on removing invasive vegetation from riparian areas.

The Alouette River offers valuable habitat for wildlife, and wildlife movement corridors along the Alouette River and its tributaries should be facilitated for wildlife conservation and resident safety. This approach takes advantage of the multiple riparian setback areas it passes through as well as mature forest. A strip of land on the southern portion of the Site was previously set aside for a potential road; however, this area could also serve as a wildlife corridor if protected from development. The BC Hydro Right of Way and forested margins along the right of way can serve as a wildlife corridor.

TABLE- SUMMARY OF RECOMMENDATIONS

Category	Recommendation
Watercourses & Fish Habitat	Conduct further assessments to confirm the extents and classifications of watercourses. Assess and implement removal of introduced barriers to fish migration (e.g., culverts) during future redevelopment applications. Protect groundwater-fed creeks to maintain cool, steady flow into the Alouette River and Kanaka Creek, which moderates temperature and erosion. Retain groundwater seepages, including those diverted into ditches, as baseflows to support sensitive habitats and fish populations.
Groundwater Quality Protection	Adhere to best management practices and regulations with respect to the storage and handling of potential groundwater contaminants. For land uses involving discharge of stormwater or discharge to ground (e.g. sewerage systems, infiltration galleries) set up monitoring networks to mitigate groundwater quality impacts. Additional protective measures may be warranted in areas where Aquifer No. 38 is present and lacks a confining layer.
Groundwater Quantity Protection	Minimize impervious surfaces by maintaining/enhancing vegetated ground and using infiltration structures like bioswales, open ditches, and rock pits. Focus infiltration in the central gravel pit area and areas underlain by well-drained soils. Avoid large-scale dewatering activities in groundwater recharge areas.

Category	Recommendation
Groundwater-Surfacewater Interaction	When evaluating the potential of Aquifer No. 38 as a future water source, considering its hydraulic connection to the Alouette River. Carefully assess development impacts on spring-fed tributaries, especially licensed ones.
Geotechnical Investigations	Include robust groundwater assessments in all development proposals, using multiple monitoring wells to evaluate local groundwater conditions. Consider slope stability hazards in areas adjacent to steep slopes.
Stormwater Management	Incorporate Low Impact Development (LID) practices to manage stormwater runoff, preserve pre-development hydrologic conditions, enhance infiltration, and reduce upland creek erosion and lowland flooding during storm events. Apply engineering controls (e.g. detention chambers) in areas with limited infiltration potential (e.g., shallow water table, poor soils, steep slopes) and high flood potential. Account for climate change predictions in their design.
Habitat Protection & Wildlife Corridors	Protect mature forest areas and steep slopes to preserve habitat for species of concern. Assess Big-leaf Maple-dominated areas with stinging nettle for Oregon Forestsnail habitat. Preserve undeveloped areas, including the BC Hydro Right of Way, northern park area, and southern proposed road alignment area, as wildlife corridors.

12 REFERENCES

AquaTerra Environmental Ltd. (2021, April). Environmental Assessment 25927 128 Avenue, Maple Ridge, BC.

Backhouse, F. (1993). Wildlife tree management in British Columbia. BC Ministry of Environment, Lands and Parks, Worker's Compensation Board of BC, BC Silviculture Branch and Canada-BC Partnership Agreement on Forest Resource Development: FRDA II.

Bannerman, S. (1998). Biodiversity and Interior Habitats: The Need to Minimize Edge Effects. B.C. Ministry of Forests Research Program, Victoria, B.C. Extension note 21, pp. 1-8.

BC Conservation Data Centre (BCCDC). (2025). BC Species and Ecosystems Explorer. http://a100.gov.bc.ca/pub/eswp/ (accessed August 2025)

BC Ministry of Environment and Climate Change Strategy. (2025). BC Water Resources Atlas. http://maps.gov.bc.ca/ess/hm/wrbc/ (accessed August 2025)

BC Ministry of Environment and Climate Change Strategy. (2025). Habitat Wizard. http://maps.gov.bc.ca/ess/hm/habwiz/ (accessed August 2025)

BC Ministry of Environment and Climate Change Strategy. (2025). iMap. http://maps.gov.bc.ca/ess/hm/cdc/ (accessed August 2025)

Butler, R.W. and R.W. Campbell. 1987. The birds of the Fraser River delta: populations, ecology, and international significance. Canadian Wildlife Service Occasional Paper No. 65, Ottawa, ON. 73 pp.

Campbell, R.W., N.K. Dawe, I.McTarrart-Cowan, J.M. Cooper, G.W. Kaiser and M.C.E. McNall. (1990). The Birds of British Columbia. Volume 2. Nonpasserines. Diurnal birds of prey through woodpeckers. Royal British Columbia Museum, Victoria, B.C.

City of Maple Ridge. (2025). Ridgeview Online Mapping. https://gis.mapleridge.ca/ridgeview/ (accessed August 2025)

City of Maple Ridge.(2015). Tree Protection and Management Bylaw. No. 7133-2015. https://www.mapleridge.ca/your-government/policies-bylaws/tree-protection-and-management-bylaw

City of Maple Ridge. (2006). Watercourse protection bylaw No. 6410 - 2006. https://www.mapleridge.ca/your-government/policies-bylaws/watercourse-protection-bylaw

Community Mapping Network, BC Ministry of Environment, Fisheries and Oceans Canada. (2025). Fish Inventory Summary System (FISS) http://cmnmaps.ca/DFO_FISS/ (accessed August 2025)

Corkran, C.C. and C.R. Thoms. (1996). Amphibians of Oregon, Washington, and British Columbia. Lone Pine Publishing, Vancouver.

Craig, V. (2003). Species account and preliminary habitat ratings for Pacific water shrew (*Sorex bendirii*). Ecologic research, prepared for British Columbia Ministry of Water, Air and Land Protection, Surrey.

Current Environmental. (2025, April 29). Environmental Impact Assessment 12955 261A Street, Maple Ridge, BC.

Department of Fisheries and Oceans. (1993). Land Development Guidelines for Protection of Aquatic Habitat.https://www.sxd.sala.ubc.ca/9_resources/fed_%20files/fed%20land%20development%20guidelines.pdf

EBB Environmental Consulting Inc. (2025, August 20). Environmental Overview of 14195 256 Street, Maple Ridge.

Engineers and Geoscientists BC., College of Applied Biologists., BC Institute of Agrologists. (2024). Joint Professional Practice Guidelines – Erosion and Sediment Control, version 1.0. https://tools.egbc.ca/Registrants/Practice-Resources/Guidelines-Advisories/Document/01525AMW5V5JO6TNVHTNEYLX3KE3HQ46EW/Erosion%20and%20Sediment%20Control

Environment and Climate Change Canada. (2018a, January 2). *Government of Canada*. Canada.ca. https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/cosewic-assessments-status-reports/spotted-owl/chapter-5.html

Environment and Climate Change Canada. (2018b, February 23). *Government of Canada*. Canada.ca. https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/cosewic-assessments-status-reports/marbled-murrelet-2012.html#_Toc329780576

Environment and Climate Change Canada. (2019, February 11). *Government of Canada*. Canada.ca. https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/cosewic-assessments-status-reports/common-nighthawk-2018.html

Environment and Climate Change Canada. (2021, November 17). *Government of Canada*. Barn Owl (Tyto alba): recovery strategy, western population, proposed 2021 - Canada.ca. https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/recovery-strategies/barn-owl-proposed-2021.html

Envirowest Consultants Inc. (2021, March 29). 13301 251A Street, Maple Ridge, BC Environmental Assessment.

Fenger, M., T. Manning, J. Cooper, S. Guy and P. Bradford. (2006). Wildlife & Trees in British Columbia.

Geological Survey of Canada. (1980). Surficial Geology, New Westminster, Map 1484A, 1:50,000

Geopacific Consultants. (2024, July 15). Geotechnical Investigation Report – Proposed Watercourse Development 12955 261A Street, Maple Ridge.

Geopacific Consultants. (2024, August 15). Geotechnical Investigation Report – Proposed Business Park 13301 251A Street, Maple Ridge.

Green, R.N. and K. Klinka. (1994). A field guide for site identification and interpretation for the Vancouver forest region land management handbook Number 28. BC Ministry of Forests. Victoria, BC.

Government of British Columbia. (1996). Weed Control Act. https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/96487_01

Government of British Columbia. (1996). Wildlife Act. https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/96488_01

Government of British Columbia. (2003). Environmental Management Act. https://www.bclaws.gov.bc.ca/civix/document/id/lc/statreg/03053_00

Government of British Columbia. (2004). Wildfire Act. https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/04031_01

Government of British Columbia. (2014). Develop with Care. https://www2.gov.bc.ca/gov/content/environment/natural-resource-stewardship/laws-policies-standards-guidance/best-management-practices/develop-with-care

Government of British Columbia. (2014). Water Sustainability Act. https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/63_88_00

Government of British Columbia. (2019). Riparian Areas Protection Regulation. https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/fish/aquatic-habitat-management/riparian-areas-regulation

Government of British Columbia. (2023). Contaminated Sites Regulation. https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/375_96_00

Government of British Columba. (2023). Spill Reporting Regulation. https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/187_2017

Government of British Columbia (2024). Hazardous Waste Regulation. https://www.bclaws.gov.bc.ca/civix/document/id/complete/statreg/63_88_00

Government of British Columbia (2025). BC Species & Ecosystems Explorer. https://a100.gov.bc.ca/pub/eswp/search.do

Government of Canda. (2025). British Columbia Approved and Working Water Quality Guidelines – BC MOE. http://www2.gov.bc.ca/gov/content/environment/air-land-water/water/water-quality/water-quality-guidelines

Government of Canada. (2024). Fisheries Act. https://laws-lois.justice.gc.ca/eng/acts/f-14/

Government of Canada (2024). Migratory Birds Convention Act. https://laws.justice.gc.ca/eng/acts/M-7.01/page-1.html

Government of Canda. (2025). Impact Assessment Act. https://laws.justice.gc.ca/eng/acts/i-2.75/page-1.html

Government of Canada. (2025). Species At Risk Act. https://laws-lois.justice.gc.ca/eng/acts/s-15.3/

Invasive Species Council of Metro Vancouver. (2025). Invasive Species Council of Metro Vancouver Best Management Practices. https://iscmv.ca/take-action/regional-best-practices

Keystone Environmental Ltd. (2022, March 23). Data Review & Watercourse Classification 13301 251A Street, Maple Ridge, BC.

Keystone Environmental Ltd. (2023, May 24). Environmental Assessment 13301 251A Street, Maple Ridge, BC.

Keystone Environmental Ltd. (2023, August 23). Environmental Impact Assessment 13301 251A Street, Maple Ridge, BC.

Keystone Environmental Ltd. (2024, October 18). Environmental Assessment 13301 251A Street, Maple Ridge, BC.

Letts Environmental. (2008, June). Environmental Management Plan District of Maple Ridge Gravel Pit located at 13790 256th Street.

Letts Environmental. (2018, June 29). Feasibility Report for 14195 256th Street, Maple Ridge, BC.

Luttmerding, H.A. (1980). Soils of the Langley-Vancouver Map Area. Report No. 15, British Columbia Soil Survey. Volume 1.

Metro Vancouver. (2025). Sensitive Ecosystem Inventory Mapping Tool. https://gis.metrovancouver.org/mvmaps/SEI

Nagorsen, D.W. (1996). Opossums, shrews and moles of British Columbia. Royal B.C. Museum, Victoria, B.C.

Ovaska K., L. Sopuck, C. Engelstoft, L. Matthias, E. Wind and J. MacGarvie. (2004). Best Management Practices for Amphibians and Reptiles in Urban and Rural Environments in British Columbia.

Redcedar. (2020, May 28). Update to the Environmental Assessment Prepared for 14310 256 Street, Maple Ridge, BC.

Redcedar. (2021, February 22). Follow Up Inspection for 14310 256 Street, Maple Ridge, BC.

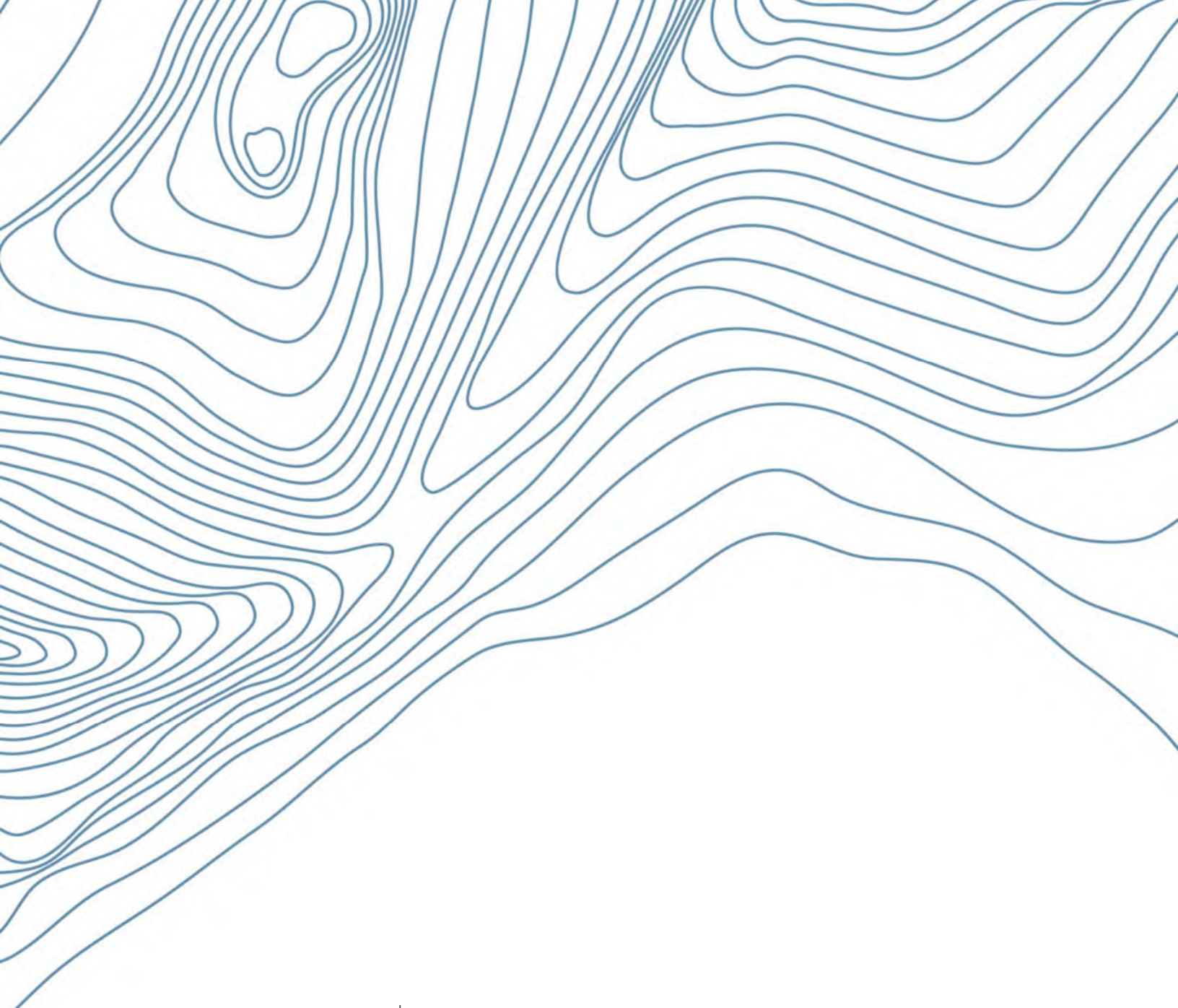
Stevens, V. (1997). The Ecological Role of Coarse Woody Debris: An Overview of the Ecological Importance of CWD in B.C. forests. Ministry of Forests Research Program.

Strathcona Forest Consulting. (2025, April 18). Wildfire hazard Assessment – Proposed Metal Fabrication facility: 12955 261A Street.

Swiftwood Forest Products Ltd. (2023, May 15). Wildfire Hazard Assessment and Risk Mitigation Plan.

Tetra Tech Canada Inc. (2021, June 24). Preliminary Geotechnical Report – 13301 – 251A Street, Maple Ridge, BC.

Tetra Tech Canada Inc. (2023, August 22). Geotechnical Assessment – 13301 – 251A Street, Maple Ridge, BC.



ACTIVE EARTH

LIST OF ACRONYMS

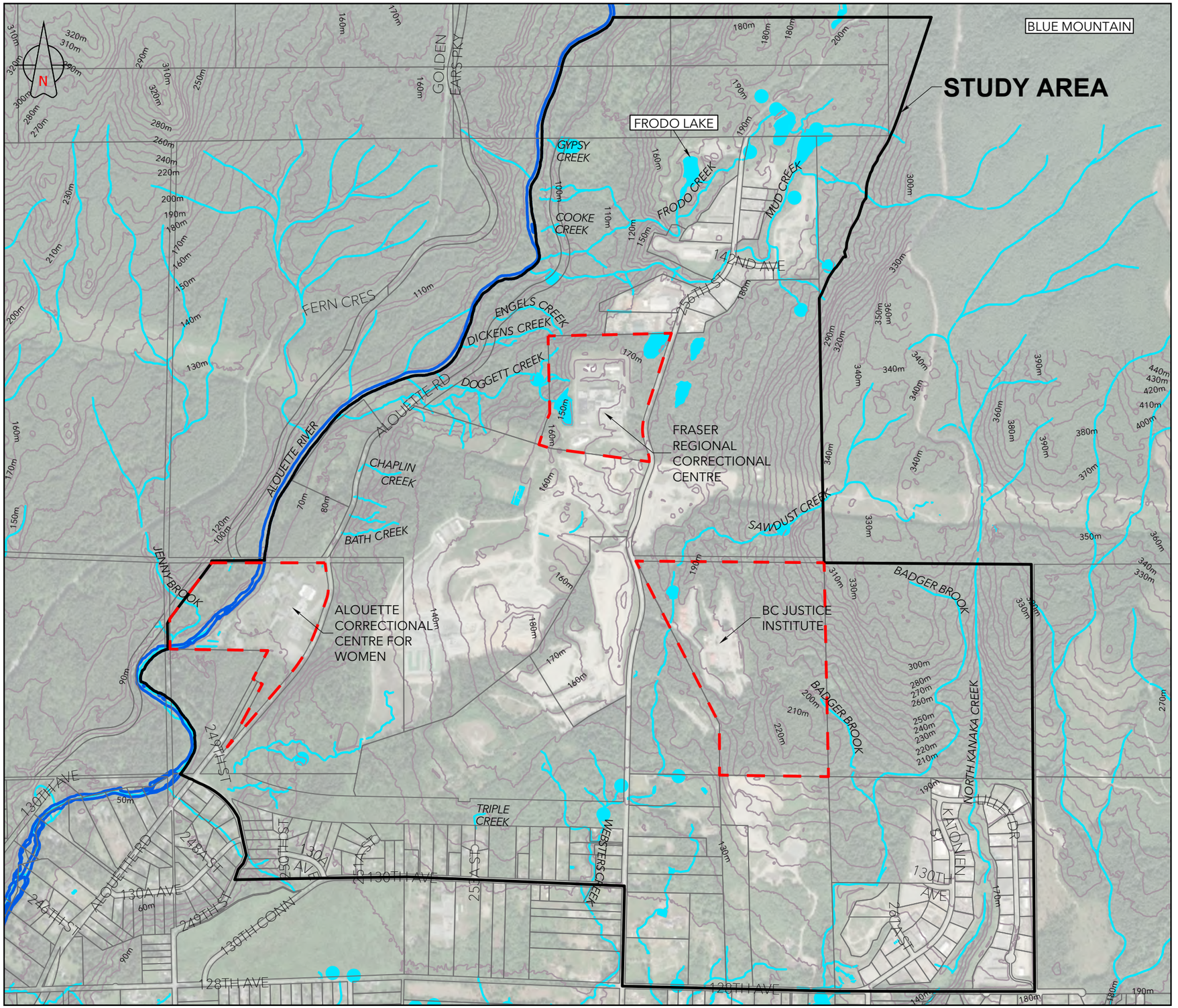
LIST OF ACRONYMS

AEC	Area of Environmental Concern
AIA	Archaeological Impact Assessment
AL	Agricultural Land Use Standards (CSR), or Agricultural Guidelines/Standards (CCME CSQG or CWS)
AQP	Appropriately Qualified Professional
BCWQG	British Columbia Water Quality Guidelines
BMP	Best Management Practices
CCME	Canadian Council of Ministers of the Environment
CEMP	Construction Environmental Management Plan
CEPA	Canadian Environmental Protection Act
CL	Commercial Land Use Standards (CSR), or Commercial Guidelines/Standards (CCME CSQG or CWS)
CSR	Contaminated Sites Regulation
DFO	Department of Fisheries and Oceans
ECCC	Environment and Climate Change Canada
EEP	Environmental Emergency Program
EM	Environmental Monitor
EMA	BC Environmental Management Act
EMBC	Emergency Management BC
EMP	Environmental Management Plan
ENV	BC Ministry of Environment & Parks
ESA	Environmentally Sensitive Area
ESC	Erosion and Sediment Control
ESRP	Emergency Spill Response Plan
FAA	Fisheries Act Authorization
FFCs	Features, Functions and Conditions
HADD	Harmful Alteration, Disruption and Destruction
HWM	High Water Mark
HWR	BC Hazardous Waste Regulation
IL	Industrial Land Use Standards (CSR), or Industrial Guidelines/Standards (CCME CSQG or CWS)
LWD	Large Woody Debris
MBCA	Migratory Bird Convention Act
MBR	Migratory Birds Regulations
MMO	Marine Mammal Observation
MOF	Ministry of Forests
NTU	Nephelometric Turbidity Units
PAH	Polycyclic Aromatic Hydrocarbons
PCOC	Potential Contaminant of Concern
PL	Urban Park Land Use Standards (CSR), or Parkland Guidelines/Standards (CCME CSQG or CWS)
PPE	Personal Protective Equipment
QEP	Qualified Environmental Professional
RAA	Riparian Assessment Area
RAPR	Riparian Areas Protection Regulation
RLld	Residential Low-Density Land Use Standards (CSR)
RLhd	Residential High-Density Land Use Standards (CSR)
SARA	Species at Risk Act
SDS	Safety Data Sheets
SPEA	Streamside Protection and Enhancement Area
SPVT	Site Potential Vegetation Type
SRE	Significant Rainfall Event
SRR	Spill Reporting Regulation
TDGA	Transportation of Dangerous Goods Act
TOB	Top of Bank
TSS	Total Suspended Solids
VOC	Volatile Organic Compounds
WHMIS	Workplace Hazardous Materials Information System

WLA	BC Wildlife Act
WLn	Wildlands Natural Land Use Standards (CSR)
WLr	Wildlands Reverted Land Use Standards (CSR)
WLRS	Ministry of Water, Land and Resource Stewardship
WSA	Water Sustainability Act
ZOS	Zones of Sensitivity

ACTIVE EARTH

FIGURES



MAP LOCATION

LEGEND

- APPROXIMATE LEGAL LOT LINE
- APPROXIMATE SITE BOUNDARY
- CONTOUR (10m)
- ALOUETTE RIVER
- APPROXIMATE STREAM LINE
- EXISTING FACILITIES
- LAKE / POND / WETLAND

1:15,000 — 0 — 250 — 500 — 1,000 Meters

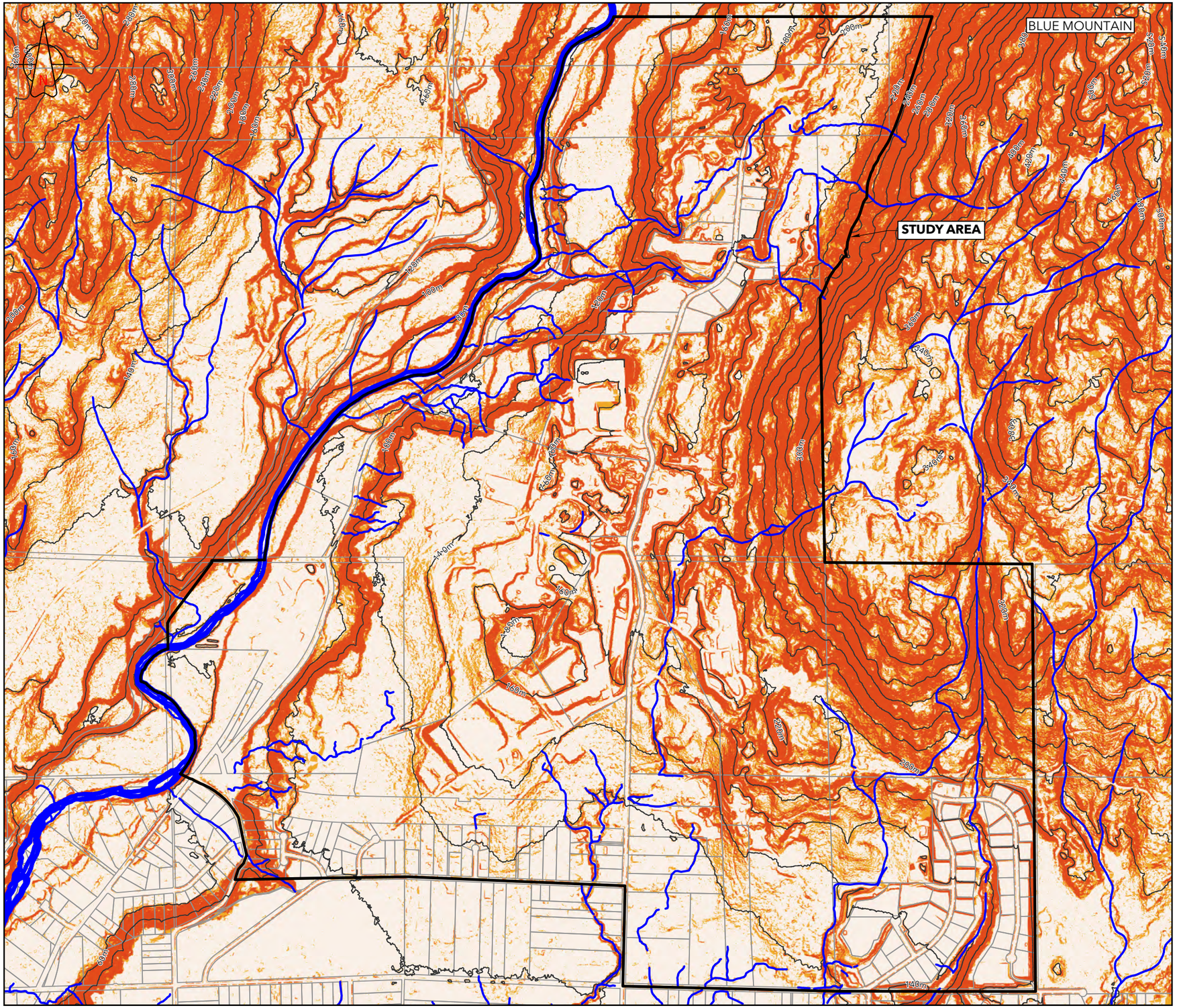
REFERENCE: CITY OF MAPLE RIDGE & METRO VANCOUVER OPEN DATA PORTAL, ESRI WORLD IMAGERY DATED 2023

ACTIVE EARTH

CLIENT NAME:	PROJECT LOCATION:
CITY OF MAPLE RIDGE	NORTH 256 STREET INDUSTRIAL LANDS, MAPLE RIDGE, BC

SITE LOCATION MAP

DWN BY: AD	DWG NAME: FIG1	DATE: 2025-11-14	FIGURE 1
CHK'D: KL	PLOT: 11x17	GISFILE: 4725	



LEGEND

- APPROXIMATE LEGAL LOT LINE
- APPROXIMATE STREAM LINE
- ALOUETTE RIVER
- CONTOUR (20m)
- INDUSTRIAL PLAN BOUNDARY

SLOPE (%)

- 0 - 14
- 15 - 24
- ≥25

NOTE:
CONTOURS AND SLOPE DERIVED FROM GOVERNMENT OF CANADA HIGH RESOLUTION DIGITAL ELEVATION MODEL (2016).

1:15,000 0 250 500 1,000 Meters

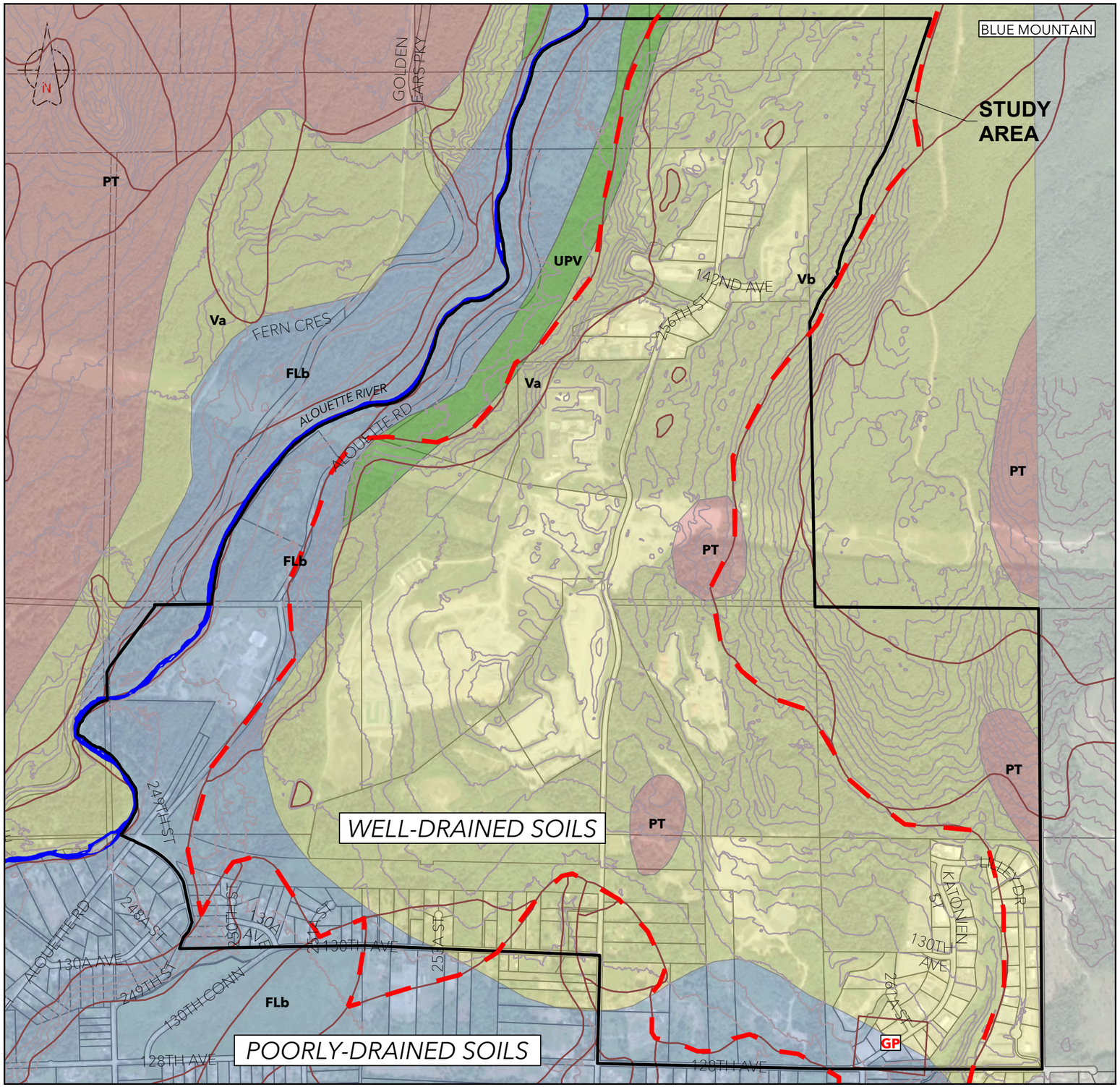
REFERENCE: B.C. DATA CATALOGUE, GOVERNMENT OF CANADA GEOSPATIAL DATA EXTRACTION

ACTIVE EARTH

CLIENT NAME:	PROJECT LOCATION:
CITY OF MAPLE RIDGE	NORTH 256 STREET INDUSTRIAL LANDS, MAPLE RIDGE, BC

SLOPE MAP

DWN BY: LT	DWG NAME: FIG2	DATE: 2025-11-14	FIGURE 2
CHK'D: KL	PLOT: 11x17	GISFILE: 4725	



LEGEND

- APPROXIMATE LEGAL LOT LINE
- APPROXIMATE SITE BOUNDARY
- TOPOGRAPHIC CONTOUR (10m)
- ALOUETTE RIVER
- WELL TO RAPIDLY DRAINED SOIL-TYPE BOUNDARY
- SOIL-TYPE POLYGON
- PRE-TERTIARY (PT)
  Mesozoic bedrock including granitic and associated rock types; where bedrock is not at the surface it is overlain by glacial deposits and colluvium
- VASHON DRIFT (Va,b)
  Till, glaciofluvial, glaciolacustrine, and ice-contact deposits: Va, lodgment till (with sandy loam matrix) and minor flow till containing lenses and interbeds of glaciolacustrine laminated stony silt; Vb, glaciofluvial sandy gravel and gravelly sand outwash and ice-contact deposits
- FORT LANGLEY FORMATION (FLa-c)
  Glacial and deltaic sediments: FLa, lodgment and flow till with sandy loam matrix containing clasts of FLc; FLb, outwash and ice-contact gravel and sand containing clasts of FLa, c; FLc, glaciomarine stony clayey silt to silty sand 8 to 90 m thick, commonly thinly bedded and containing marine shells
- UNDIVIDED PRE-VASHON DEPOSITS
  Till, glaciofluvial, glaciolacustrine, fluvial, marine, and organic sediments

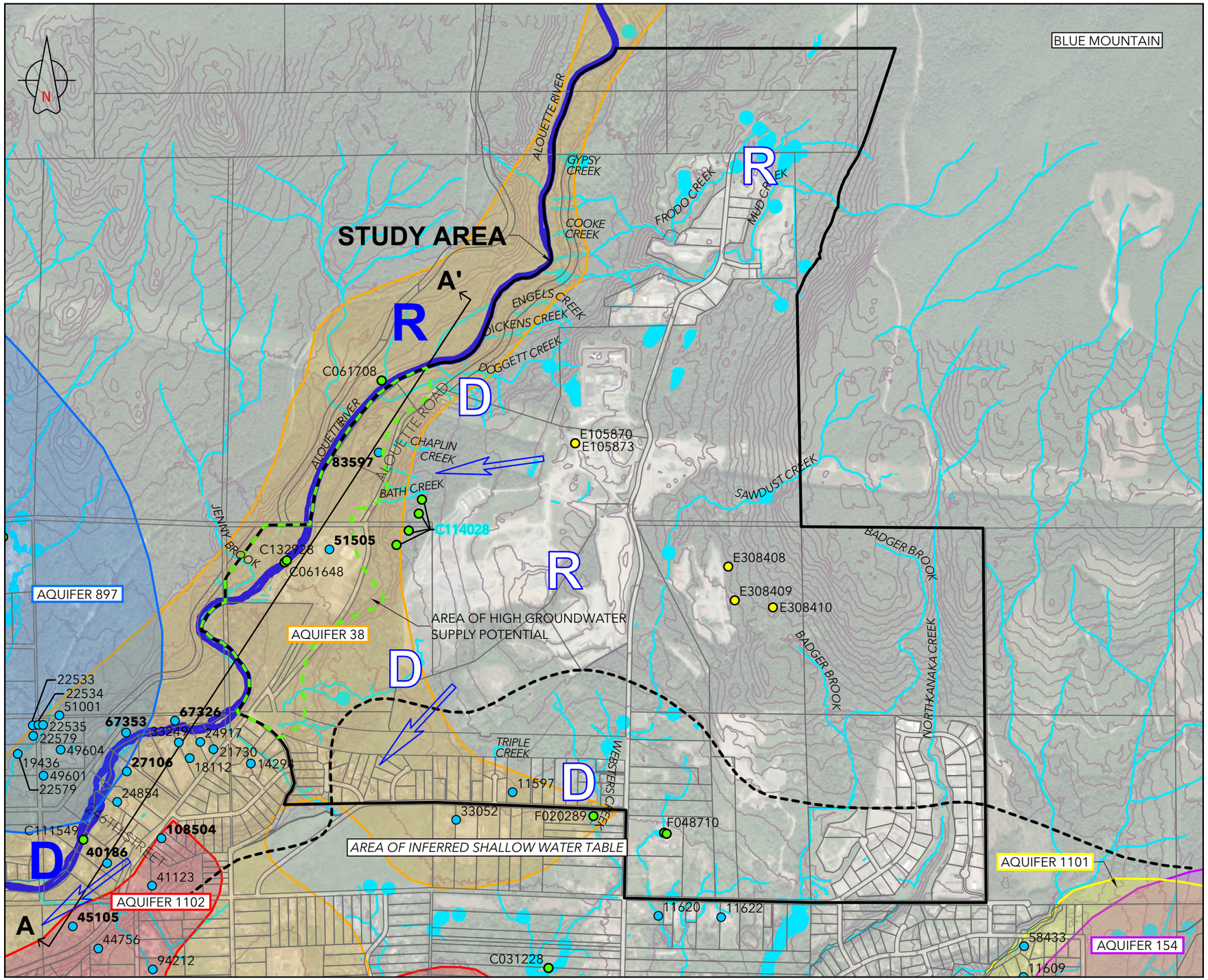
REFERENCE: B.C. DATA CATALOGUE, B.C. SOILS SURVEY, ESRI WORLD IMAGERY DATED 2023

ACTIVE EARTH

CLIENT NAME: CITY OF MAPLE RIDGE	PROJECT LOCATION: NORTH 256 STREET INDUSTRIAL LANDS, MAPLE RIDGE, BC

SOILS AND SURFICIAL GEOLOGY MAP

DWN BY: AD	DWG NAME: FIG3	DATE: 2025-11-14	FIGURE 3
CHK'D: KL	PLOT: 11x17	GISFILE: 4725	



REFERENCE: CITY OF MAPLE RIDGE & METRO VANCOUVER OPEN DATA PORTAL, ESRI WORLD IMAGERY DATED 2023

LEGEND

- APPROXIMATE LEGAL LOT LINE
- APPROXIMATE SITE BOUNDARY
- APPROXIMATE STREAM LINE
- TOPOGRAPHIC CONTOUR (10m)
- AREA OF HIGH GROUNDWATER SUPPLY POTENTIAL
- INFERRED SHALLOW WATER TABLE BOUNDARY
- LAKE / POND / WETLAND
- WATER WELL (LABELLED BY WELL TAG NUMBER)
- WATER LICENCE
- EMS - WATER SITES (WELL)
- R — GROUNDWATER RECHARGE AREA (INFILTRATION)
- D — GROUNDWATER DISCHARGE AREA (SPRINGS, WET GROUND)
- R — GROUNDWATER RECHARGE AREA (RIVER EXFILTRATION)
- D — GROUNDWATER DISCHARGE AREA (BASEFLOW TO RIVER)
- GROUNDWATER FLOW DIRECTION

ACTIVE EARTH

CLIENT NAME:	PROJECT LOCATION:
CITY OF MAPLE RIDGE	NORTH 256 STREET INDUSTRIAL LANDS, MAPLE RIDGE, BC

HYDROGEOLOGICAL CONTEXT SITE PLAN

DWN BY: TL	DWG NAME: FIG4	DATE: 2025-11-14	FIGURE 4
CHK'D: KL	PLOT: 11x17	GISFILE: 4725	

SOUTH–WEST

A

NORTH–EAST

A'

45105 40186 108504 27106 67326 51505 83597

246TH STREET

APPROXIMATE GROUND SURFACE ELEVATION

APPROXIMATE ALOUETTE RIVER ELEVATION

AQUIFER NO. 38

D

R

100m 90m 80m 70m 60m 50m 40m 30m 20m 10m 0m −10m −20m

SA & SI
TI & CL
CL
TI
GR
SA & GR
SI & GR
SI & SA
SA
CL
GR & BO
BO
SA, GR, & BO
GR

VERTICAL SCALE 1:500
(EXAGGERATION 20x)
ELEVATION (GEODETIC) (m)

1:10,000 0 200 600m

LEGEND

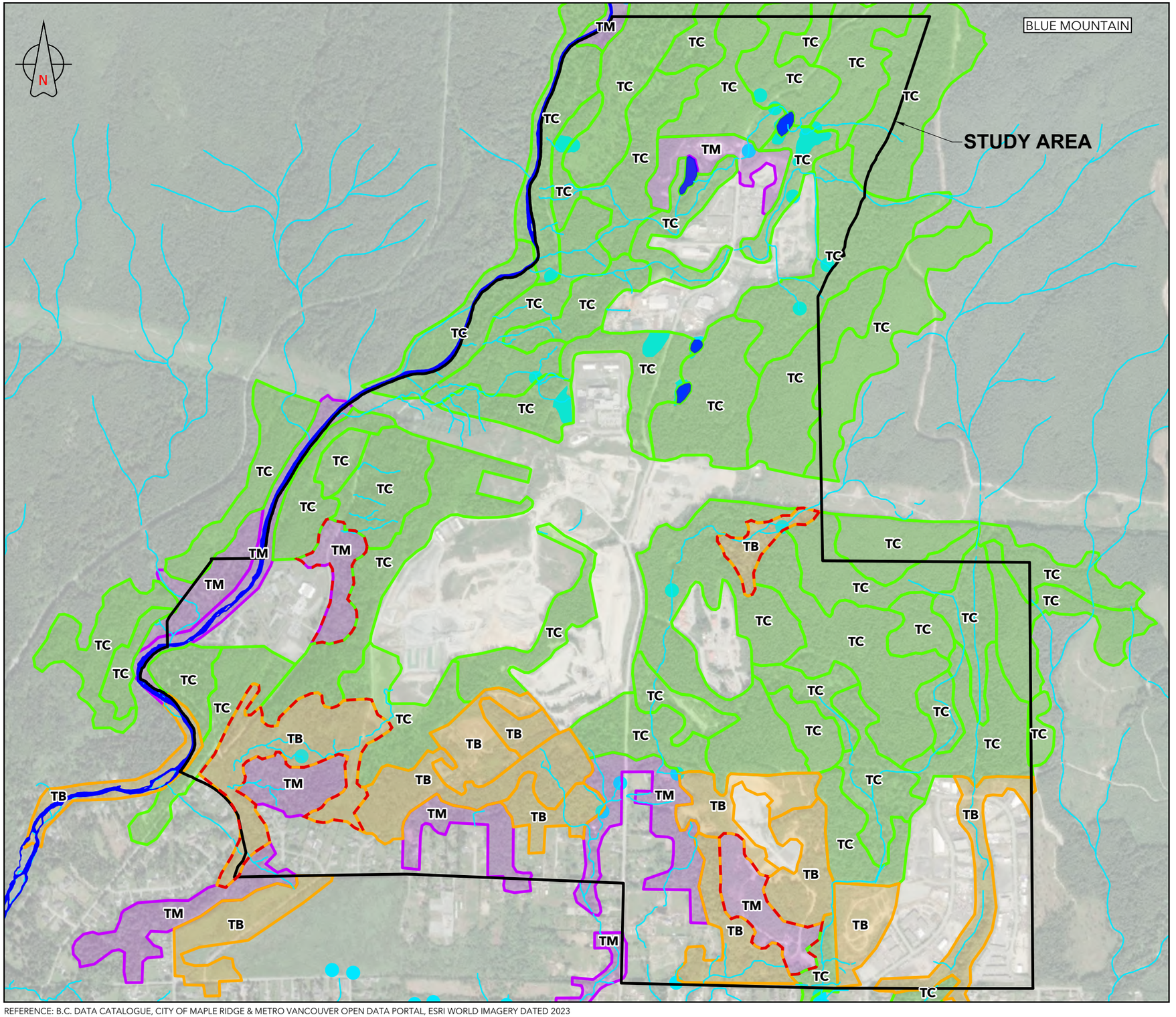
- WELL WATER LEVEL
- INFERRED RIVER WATER LEVEL
- INFERRED WATER TABLE
- INFERRED DIRECTION OF GROUNDWATER FLOW
- SA SAND
- GR GRAVEL
- BO BOULDERS
- SI SILT
- TI TILL
- CL CLAY
- R GROUNDWATER RECHARGE AREA (RIVER EXFILTRATION)
- D GROUNDWATER DISHARGE AREA (BASEFLOW TO RIVER)

ACTIVE EARTH

CLIENT NAME: CITY OF MAPLE RIDGE	PROJECT LOCATION: NORTH 256 STREET INDUSTRIAL LANDS, MAPLE RIDGE, B

CROSS SECTION A-A'

DWN BY: TL	DWG NAME: −5	DATE: 2025−07−23	FIGURE 5
CHK'D: KT	PLOT: A2	CADFILE: 4725	



LEGEND

- APPROXIMATE SITE BOUNDARY
- ALOUETTE RIVER
- APPROXIMATE STREAM LINE
- WETLAND
- TREED - BROADLEAF / DECIDUOUS (TB)
- TREED - CONIFEROUS (TC)
- TREED - MIXED (TM)
- NON-TREED - LAKE
- BIG-LEAF MAPLE DOMINATED COMMUNITY

NOTE:
MAPPED POLYGONS ARE BASED ON CURRENT VEGETATION RESOURCE INVENTORY (VRI) MAPPING.

1:15,000 — 0 250 500 1,000 Meters

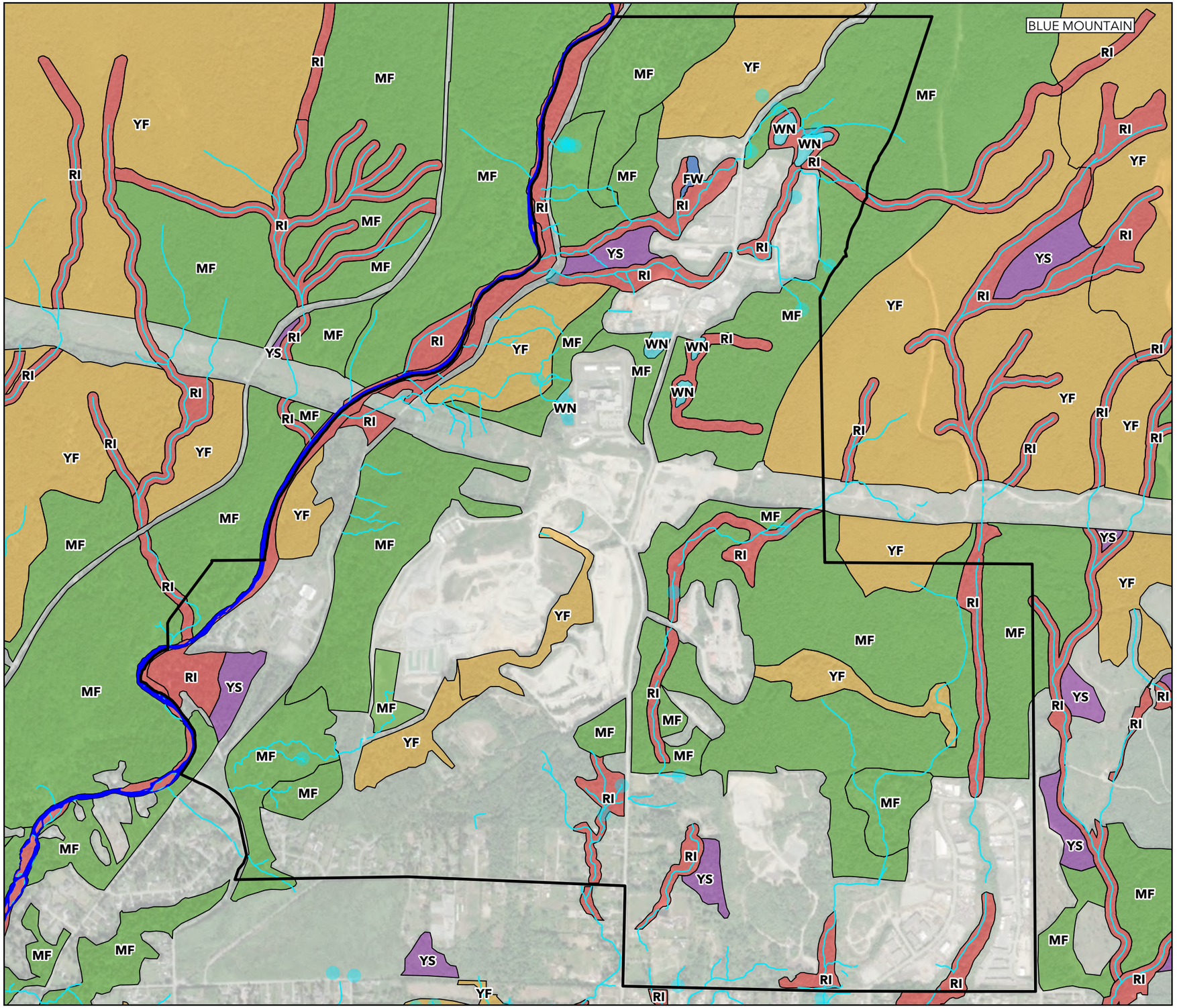
REFERENCE: B.C. DATA CATALOGUE, CITY OF MAPLE RIDGE & METRO VANCOUVER OPEN DATA PORTAL, ESRI WORLD IMAGERY DATED 2023

ACTIVE EARTH

CLIENT NAME:	PROJECT LOCATION:
CITY OF MAPLE RIDGE	NORTH 256 STREET INDUSTRIAL LANDS, MAPLE RIDGE, BC

VEGETATION COMMUNITIES (VRI) MAP

DWN BY: LT	DWG NAME: FIG6	DATE: 2025-11-14	FIGURE 6
CHK'D: KL	PLOT: 11x17	GISFILE: 4725	



LEGEND

- APPROXIMATE SITE BOUNDARY
- ALOUETTE RIVER
- APPROXIMATE STREAM LINE
- WETLAND (WN)
- YOUNG FOREST (YF: > 5 ha)
- MATURE FOREST (MF)
- RIPARIAN AREA (RI)
- YOUNG FOREST (YS: < 5 ha)
- FRESHWATER LAKE / POND (FW)

1:15,000 0 250 500 1,000 Meters

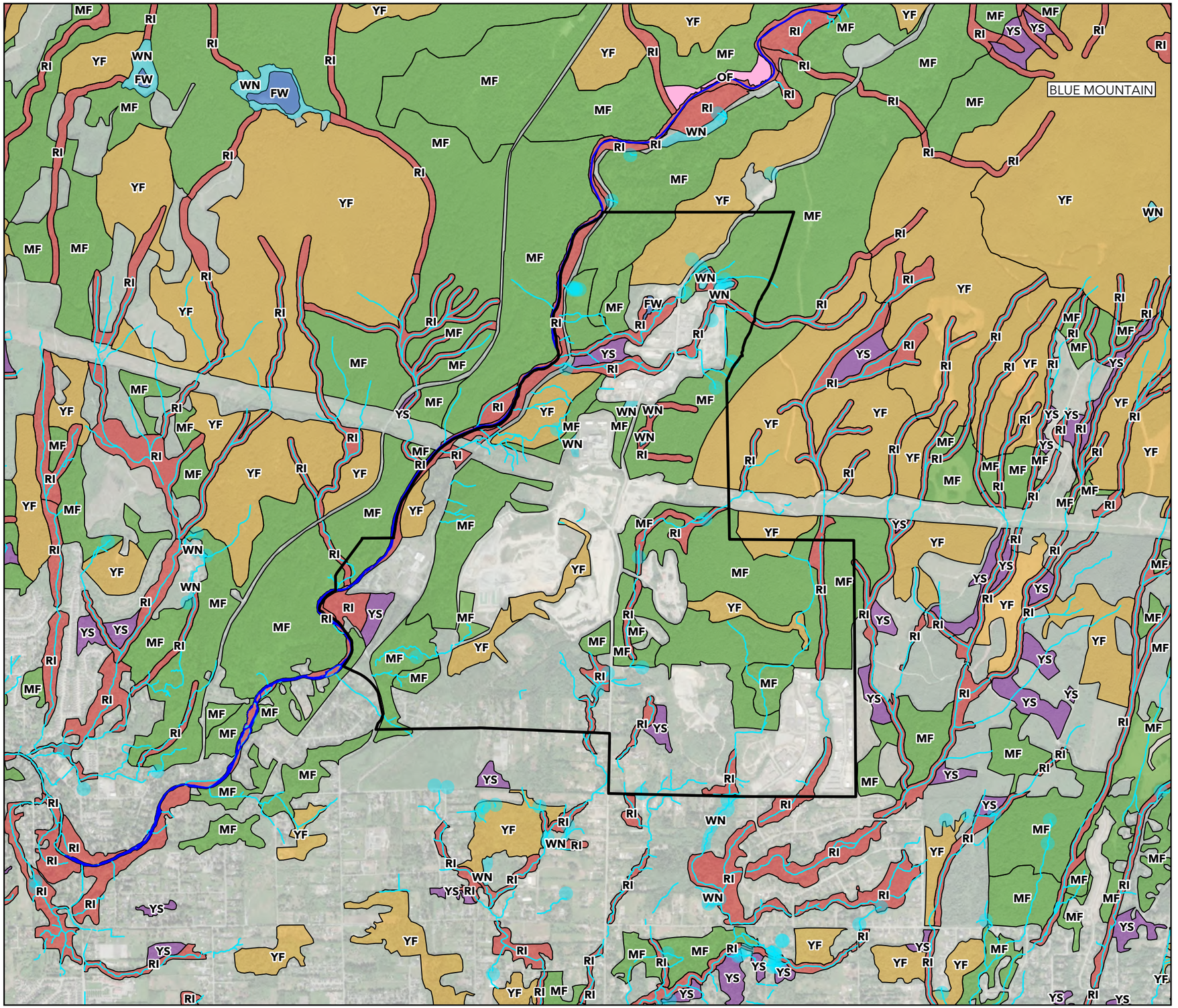
REFERENCE: CITY OF MAPLE RIDGE & METRO VANCOUVER OPEN DATA PORTAL, ESRI WORLD IMAGERY DATED 2023

ACTIVE EARTH

CLIENT NAME:	PROJECT LOCATION:
CITY OF MAPLE RIDGE	NORTH 256 STREET INDUSTRIAL LANDS, MAPLE RIDGE, BC

SENSITIVE ECOSYSTEM INVENTORY (SEI) MAP

DWN BY: AD	DWG NAME: FIG7	DATE: 2025-11-14	FIGURE 7
CHK'D: KL	PLOT: 11x17	GISFILE: 4725	



LEGEND

- APPROXIMATE SITE BOUNDARY
- ALOUETTE RIVER
- APPROXIMATE STREAM LINE
- WETLAND (WN)
- YOUNG FOREST (YF: > 5 ha)
- MATURE FOREST (MF)
- RIPARIAN AREA (RI)
- YOUNG FOREST (YS: < 5 ha)
- FRESHWATER LAKE / POND (FW)
- OLD FOREST (OF)

1:25,000 0 425 850 1,700 Meters

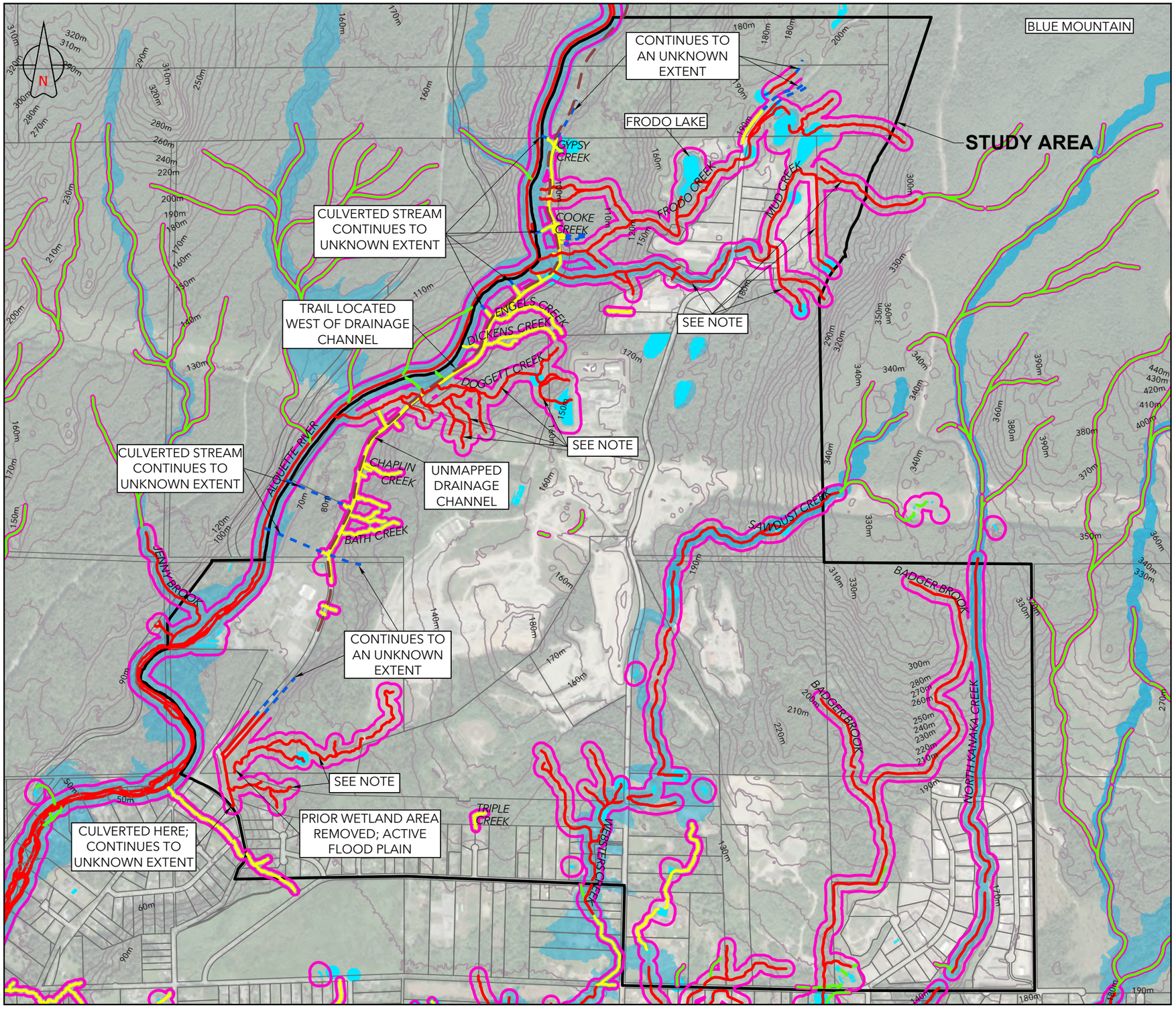
REFERENCE: CITY OF MAPLE RIDGE & METRO VANCOUVER OPEN DATA PORTAL, ESRI WORLD IMAGERY DATED 2023

ACTIVE EARTH

CLIENT NAME:	PROJECT LOCATION:
CITY OF MAPLE RIDGE	NORTH 256 STREET INDUSTRIAL LANDS, MAPLE RIDGE, BC

SENSITIVE ECOSYSTEM INVENTORY (SEI) MAP (ZOOMED)

DWN BY: AD	DWG NAME: FIG7a	DATE: 2025-11-14	FIGURE 7a
CHK'D: KL	PLOT: 11x17	GISFILE: 4725	



REFERENCE: B.C. DATA CATALOGUE, CITY OF MAPLE RIDGE & METRO VANCOUVER OPEN DATA PORTAL, ESRI WORLD IMAGERY DATED 2023

LEGEND

- APPROXIMATE LEGAL LOT LINE
- APPROXIMATE SITE BOUNDARY
- CONTOUR (10m)
- CLASS A WATERCOURSE (*30m Setback*)
- CLASS B WATERCOURSE (*15m Setback*)
- CLASS C WATERCOURSE (*5m Setback*)
- STREAMSIDE SETBACK
- TRAIL LOCATION
- LAKE / POND / WETLAND
- NHC-PREDICTED FLOOD HAZARD AREA

NOTES:

- HIGHLIGHTED STREAMS MAY BE CLASS B DUE TO FISH BARRIERS; FURTHER ASSESSMENT OF FISH PRESENCE OR ABSENCE IS REQUIRED.
- PONDS / LAKES / WETLANDS WITH NO SETBACKS SHOWN ARE CLASSIFIED AS ISOLATED.

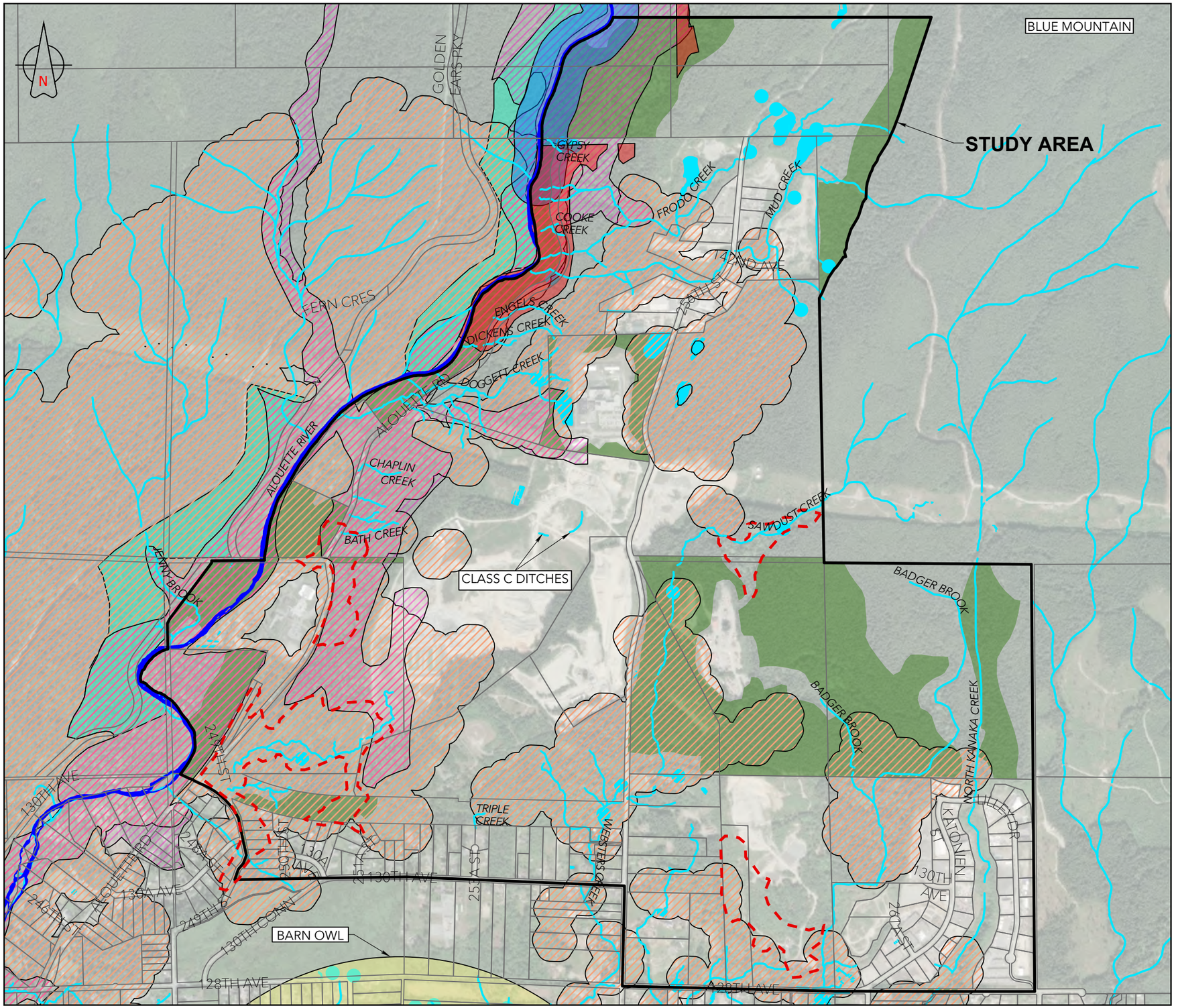
1:15,000 0 250 500 1,000 Meters

ACTIVE EARTH

CLIENT NAME:	PROJECT LOCATION:
CITY OF MAPLE RIDGE	NORTH 256 STREET INDUSTRIAL LANDS, MAPLE RIDGE, BC

STREAMSIDE SETBACK MAP

DWN BY: AD	DWG NAME: FIG8	DATE: 2025-11-20	FIGURE 8
CHK'D: KL	PLOT: 11x17	GISFILE: 4725	



LEGEND

- APPROXIMATE LEGAL LOT LINE
- APPROXIMATE SITE BOUNDARY
- ALOUETTE RIVER
- APPROXIMATE STREAM LINE
- LAKE / POND / WETLAND
- OLD-GROWTH MATURE FOREST
- MARBLED MURRELET
- PACIFIC WATER SHREW
- BARN OWL
- SPOTTED OWL
- OREGON FORESTSNAIL
- OLD GROWTH MANAGEMENT AREA (NON-LEGAL)
- BIG-LEAF MAPLE DOMINATED COMMUNITY

NOTE:
THE CRITICAL HABITAT STATUS FOR PACIFIC WATER SHREW AND MARBLED MURRELET IS FINAL; ALL OTHERS ARE PROPOSED.

1:15,000 — 0 250 500 1,000 Meters

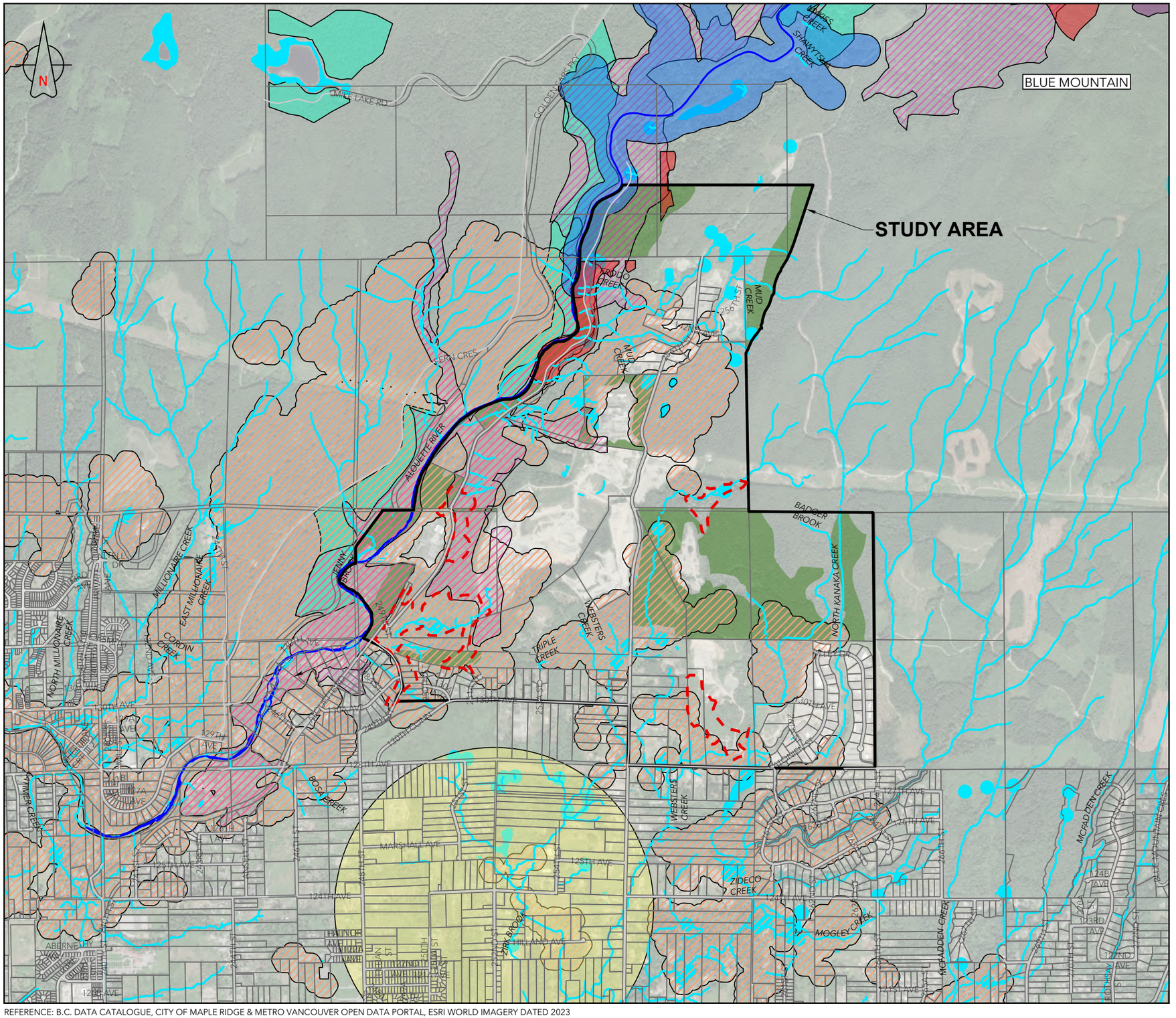
REFERENCE: B.C. DATA CATALOGUE, CITY OF MAPLE RIDGE & METRO VANCOUVER OPEN DATA PORTAL, ESRI WORLD IMAGERY DATED 2023

ACTIVE EARTH

CLIENT NAME: CITY OF MAPLE RIDGE	PROJECT LOCATION: NORTH 256 STREET INDUSTRIAL LANDS, MAPLE RIDGE, BC

SPECIES AT RISK CRITICAL HABITAT MAP

DWN BY: AD	DWG NAME: FIG9	DATE: 2025-11-14	FIGURE 9
CHK'D: KL	PLOT: 11x17	GISFILE: 4725	



REFERENCE: B.C. DATA CATALOGUE, CITY OF MAPLE RIDGE & METRO VANCOUVER OPEN DATA PORTAL, ESRI WORLD IMAGERY DATED 2023

LEGEND

- APPROXIMATE LEGAL LOT LINE
- APPROXIMATE SITE BOUNDARY
- ALOUETTE RIVER
- APPROXIMATE STREAM LINE
- LAKE / POND / WETLAND
- OLD-GROWTH MATURE FOREST
- MARBLED MURRELET
- PACIFIC WATER SHREW
- BARN OWL
- SPOTTED OWL
- OREGON FORESTSNAIL
- OLD GROWTH MANAGEMENT AREA (NON-LEGAL)
- OLD GROWTH MANAGEMENT AREA (LEGAL)
- BIG-LEAF MAPLE DOMINATED COMMUNITY

NOTE:
THE CRITICAL HABITAT STATUS FOR PACIFIC WATER SHREW AND MARBLED MURRELET IS FINAL; ALL OTHERS ARE PROPOSED.

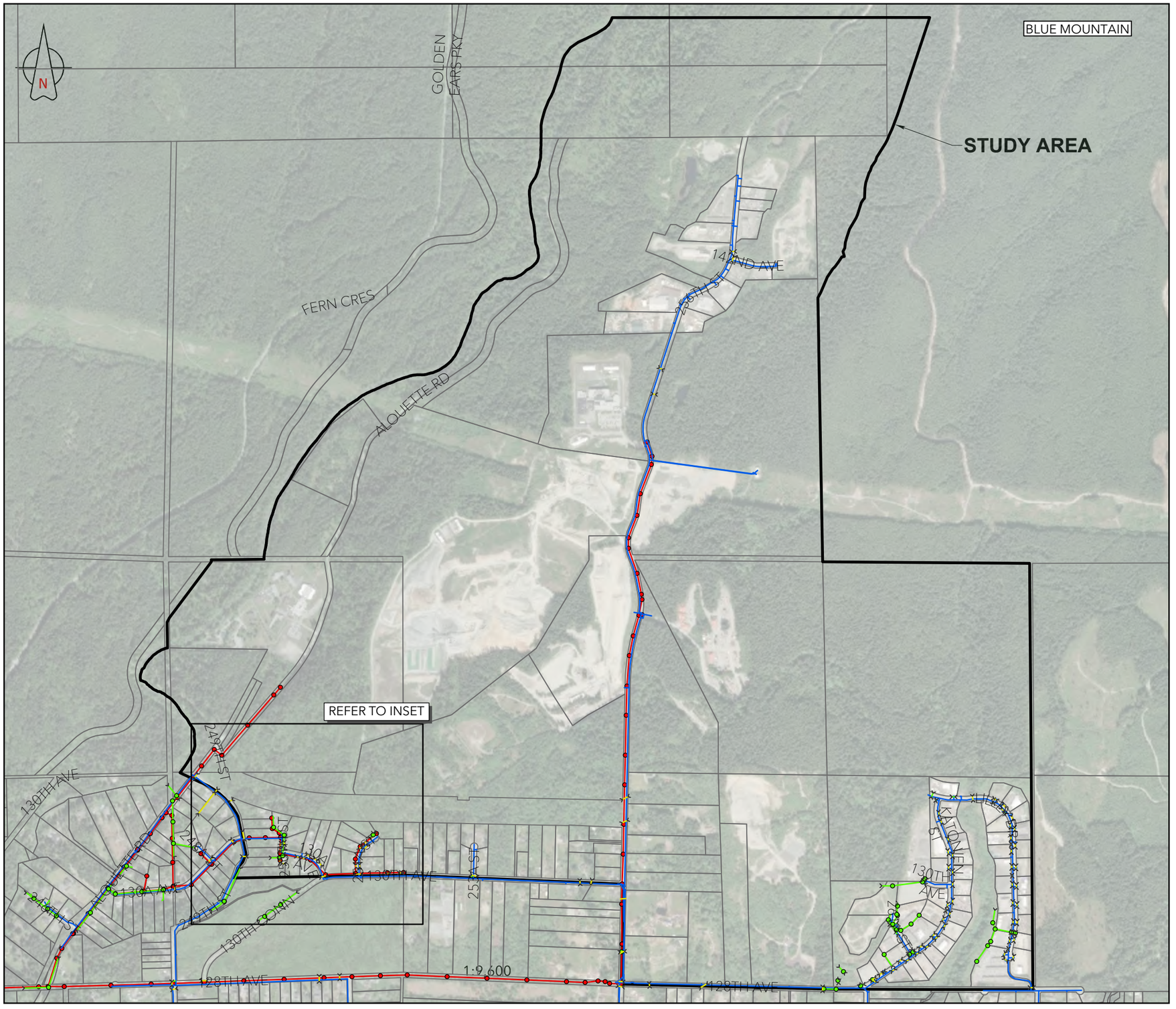
1:25,000 — 0 — 425 — 850 — 1,700 Meters

ACTIVE EARTH

CLIENT NAME: CITY OF MAPLE RIDGE	PROJECT LOCATION: NORTH 256 STREET INDUSTRIAL LANDS, MAPLE RIDGE, BC

SPECIES AT RISK CRITICAL HABITAT MAP (ZOOMED)

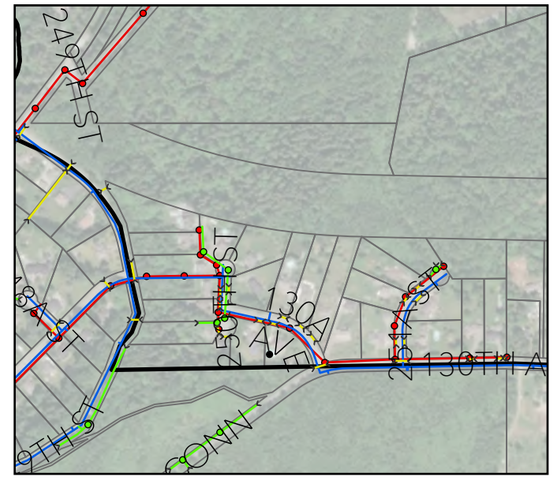
DWN BY: AD	DWG NAME: FIG9a	DATE: 2025-11-14	FIGURE 9a
CHK'D: KL	PLOT: 11x17	GISFILE: 4725	



LEGEND

- APPROXIMATE LEGAL LOT LINE
- APPROXIMATE SITE BOUNDARY
- WATER MAIN
- SANITARY MAIN
- SANITARY MANHOLE
- DRAINAGE MAIN
- DRAINAGE CULVERT
- DRAINAGE MANHOLE
- DRAINAGE INLET/OUTLET

INSET LOCATION



1:15,000 0 250 500 1,000 Meters

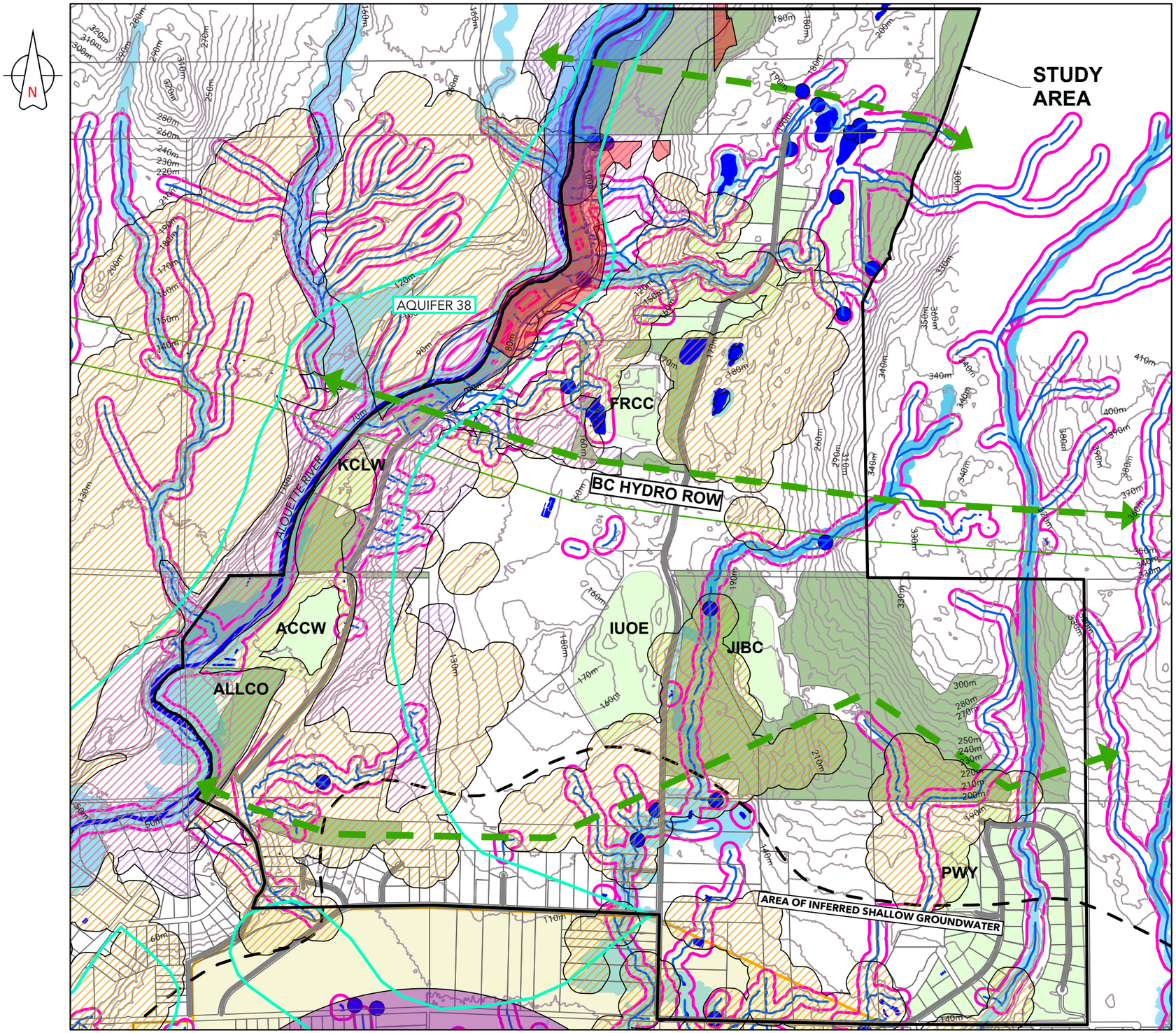
REFERENCE: CITY OF MAPLE RIDGE OPEN DATA PORTAL, ESRI WORLD IMAGERY DATED 2023

ACTIVE EARTH

CLIENT NAME: CITY OF MAPLE RIDGE	PROJECT LOCATION: NORTH 256 STREET INDUSTRIAL LANDS, MAPLE RIDGE, BC

UTILITIES MAP

DWN BY: AD	DWG NAME: FIG10	DATE: 2025-11-14	FIGURE 10
CHK'D: KL	PLOT: 11x17	GISFILE: 4725	



REFERENCE: B.C. DATA CATALOGUE & CITY OF MAPLE RIDGE OPEN DATA PORTAL

LEGEND

- APPROXIMATE LEGAL LOT LINE
- APPROXIMATE SITE BOUNDARY
- CONTOUR (10m)
- WATERCOURSE
- 30m STREAMSIDE SETBACK
- EXISTING ROADS
- OLD-GROWTH MATURE FOREST
- MARBLED MURRELET
- PACIFIC WATER SHREW
- BARN OWL
- SPOTTED OWL
- OREGON FORESTSNAIL
- BC HYDRO ROW
- POTENTIAL WILDLIFE CORRIDOR
- AGRICULTURAL LAND RESERVE
- LAKE / POND / WETLAND
- NHC-PREDICTED FLOOD HAZARD AREA
- EXISTING DEVELOPMENT / PARK
- AQUIFER 38 BOUNDARY
- INFERRED SHALLOW GROUNDWATER TABLE

LABELS

FRCC - FRASER REGIONAL CORRECTIONAL CENTRE
ACCW - ALOUETTE CORRECTIONAL CENTRE FOR WOMEN
JIBC - JUSTICE INSTITUTE OF BRITISH COLUMBIA
IUOE -INTERNATIONAL UNION OF OPERATING ENGINEERS
PWY - PUBLIC WORKS YARD
KCLW - KATZIE CAMP LOCKWOOD
ALLCO - ALLCO MUNICIPAL PARK

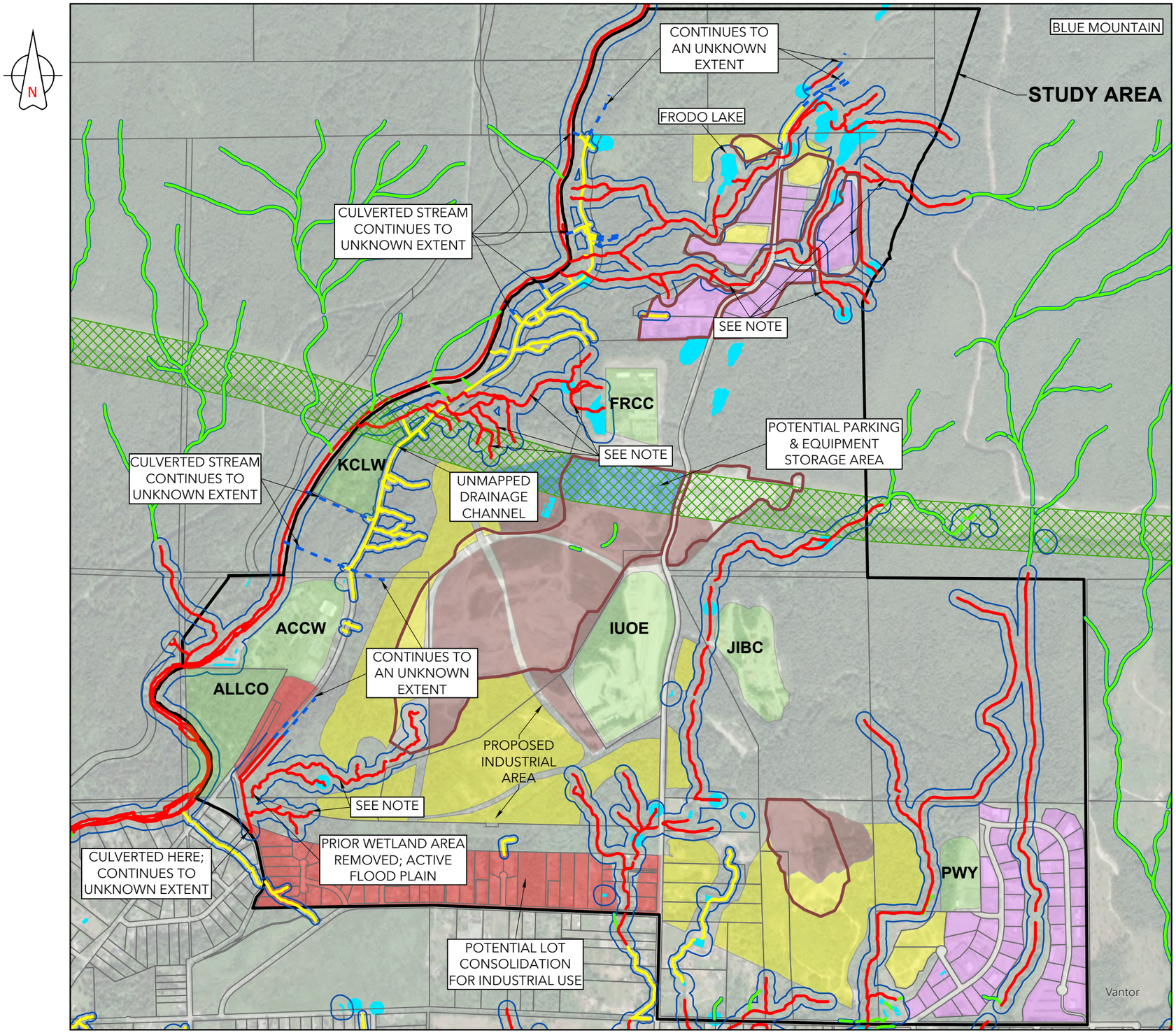
NOTE:
ALL WATERCOURSES SHOWN ARE UNCLASSIFIED WITH 30m SETBACKS.

ACTIVE EARTH

CLIENT NAME:	PROJECT LOCATION:
CITY OF MAPLE RIDGE	NORTH 256 STREET INDUSTRIAL LANDS, MAPLE RIDGE, BC

DEVELOPMENT CONSTRAINTS MAP

DWN BY: AD	DWG NAME: FIG11	DATE: 2025-11-14	FIGURE 11
CHK'D: KL	PLOT: 11x17	GISFILE: 4725	



REFERENCE: CITY OF MAPLE RIDGE OPEN DATA PORTAL, ESRI WORLD IMAGERY DATED 2023

LEGEND

- APPROXIMATE LEGAL LOT LINE
- APPROXIMATE SITE BOUNDARY
- CLASS A WATERCOURSE (*30m Setback*)
- CLASS B WATERCOURSE (*15m Setback*)
- CLASS C WATERCOURSE (*5m Setback*)
- SPEA SETBACK (*subject to confirmation*)
- EXISTING DEVELOPED AREAS (*potential for redevelopment / expansion*)
- CURRENT FACILITIES
- LAKE / POND / WETLAND
- BC HYDRO ROW
- POTENTIAL YARD SPACE
- EXISTING RESIDENTIAL
- INDUSTRIAL - CURRENT GRAVEL OPERATORS
- INDUSTRIAL - PROPOSED
- INDUSTRIAL - EXISTING

LABELS

FRCC - FRASER REGIONAL CORRECTIONAL CENTRE
ACCW - ALOUETTE CORRECTIONAL CENTRE FOR WOMEN
JIBC - JUSTICE INSTITUTE OF BRITISH COLUMBIA
IUOE -INTERNATIONAL UNION OF OPERATING ENGINEERS
PWY - PUBLIC WORKS YARD
KCLW - KATZIE CAMP LOCKWOOD
ALLCO - ALLCO MUNICIPAL PARK

NOTE:

- HIGHLIGHTED STREAMS MAY BE CLASS B DUE TO FISH BARRIERS; FURTHER ASSESSMENT OF FISH PRESENCE OR ABSENCE IS REQUIRED.
- STREAMS SHOWN WITH EXISTING AND PROPOSED CLASSIFICATIONS (i.e., CLASS A & CLASS B) AND CORRESPONDING SETBACKS.

ACTIVE EARTH

CLIENT NAME:	PROJECT LOCATION:
CITY OF MAPLE RIDGE	NORTH 256 STREET INDUSTRIAL LANDS, MAPLE RIDGE, BC

OPPORTUNITIES MAP

DWN BY: AD	DWG NAME: FIG12	DATE: 2025-11-14	FIGURE 12
CHK'D: KL	PLOT: 11x17	GISFILE: 4725	

ACTIVE EARTH

APPENDIX A
Aquifer Classifications

activeearth.ca

AQUIFER CLASSIFICATION WORKSHEET

DATE: 18/10/2007 – Rev. 18/11/2015 (Lowen Hydrogeology Consulting Ltd.)

AQUIFER REFERENCE NUMBER: 0038

DESCRIPTIVE LOCATION OF AQUIFER: Alouette River

NTS MAP SHEET: 92 G 01

BCGS MAP SHEETS: 92G.027.2.4 / 92G.028.1.3 / 92G.028.1.4 / 92G.028.3.1

CLASSIFICATION: III B **RANKING:** 9

Aquifer Size: 17 km^2

Aquifer Boundaries: The boundaries were delineated based on surficial geology. The aquifer encompasses 3 unconsolidated units: gravel and sands of recent ages (< 10,000 yr), an intermediate gravel and sand unit and till from the last glaciation epoch (11,000 – 25,000 yr). The aquifer follows the course of the Alouette River.

Aquifer Sub-type: 1b
Type – Predominantly unconfined fluvial or glacio-fluvial sand and gravel aquifers found along river or stream valley bottoms.
Subtype – Aquifers found along river of moderate stream order with the potential to be hydraulically influenced by the river.

Aquifer Priority Rating for Observation Wells: 27.2

Geologic Formation (overlying materials): The aquifer is overlain by unconsolidated units described in the well logs as either till or clay.

Geologic Formation (aquifer): The aquifer boundaries encompass several geological units. The western part is composed of the post-glacial Salish sediments, consisting of stream deltaic, channel fill and overbank sediments. The aquifer extends to the east within sediments of the Fort Langley formation and part of the Vashon drifts, consisting of proglacial deltaic sand and gravel and till-like ice-contact deposits. The well log records describe the aquifer formation as a mix variable size particles, ranging from sand to gravel to cobbles.

Confined: The aquifer is well confined with till and/or clay. Confining thicknesses range from 2 to 140 ft (0.6 to 42.7 m), with an average thickness of 41 ft (12.5 m), a geometric mean and a median of both 25 ft (7.6 m).

Vulnerability: Medium. The confining layer is thick and consistent all over the aquifer formation, however the water table is considered as shallow, with an average of 15 ft (4.6 m). Also, the aquifer is likely to be hydraulically connected to the Alouette River.

Productivity: Moderate. Yields range from 1.5 to 81 USgpm (0.09 to 5.1 L/s), with an average of 17 USgpm (1.1 L/s), a geometric mean of 11 USgpm (0.7 L/s) and a median of 12 USgpm (0.8 L/s).

Depth to Water: The groundwater table is shallow and ranges from 3 ft to 161 ft (0.9 to 49.1 L/s). The average depth is 33 ft (10.1 L/s), the geometric mean 16 ft (4.9 L/s) and the median 15 ft (4.6 L/s).

Direction of Groundwater Flow: The general groundwater flow direction is likely to follow the Alouette River to the west.

Recharge: The aquifer is recharged by surface water running off and/or infiltrating from the highlands, located to the north. Alouette River and the aquifer are likely to be hydraulically connected and may seasonally recharge each other as well.

Domestic Well Density: Low (2.5 wells / km^2).

Type of Water Use: Drinking water, municipal or domestic.

Reliance on Source: Conjunctive. The aquifer and the river can be used both as a source of drinking water.

Conflicts between Users: None reported.

Quantity Concerns: None reported.

Quality Concerns: None reported.

Comments: The well depths range from 5 ft (1.5 m) to 334 ft (101.8 m). The median depth is 42 ft (12.8 m), the average 76 ft (23.2 m) and the geometric mean 51 ft (15.5 m).

References:

- Berardinucci J. and K. Ronneseth, 2002. *Guide to Using the BC Aquifer Classification Maps for the Protection and Management of Groundwater*. BC Ministry of Water, Land and Air Protection, Water Air and Climate Change Branch, Water Protection Section.
- IMapBC: http://maps.gov.bc.ca/ess/sv/imapbc/
- Turner, R.J.W., Clague, J.J., Groulx, B.J., and J.M. Journeay. 1998 - Geological Map of the Vancouver Metropolitan Area – Geological Survey of Canada, Open File 3511
- Surficial Geology New Westminster, B.C., Map 1484 A (Sc. 1:50,000), 1976

AQUIFER CLASSIFICATION AND RANKING

AQUIFER LOCATION: Alouette River

AQUIFER REFERENCE NUMBER: 0038

AQUIFER SUB-TYPE: 1b

AQUIFER PRIORITY RATING FOR OBSERVATION WELLS: 27.2

CLASSIFICATION: III B **RANKING VALUE:** 9

***Classification Component*:**

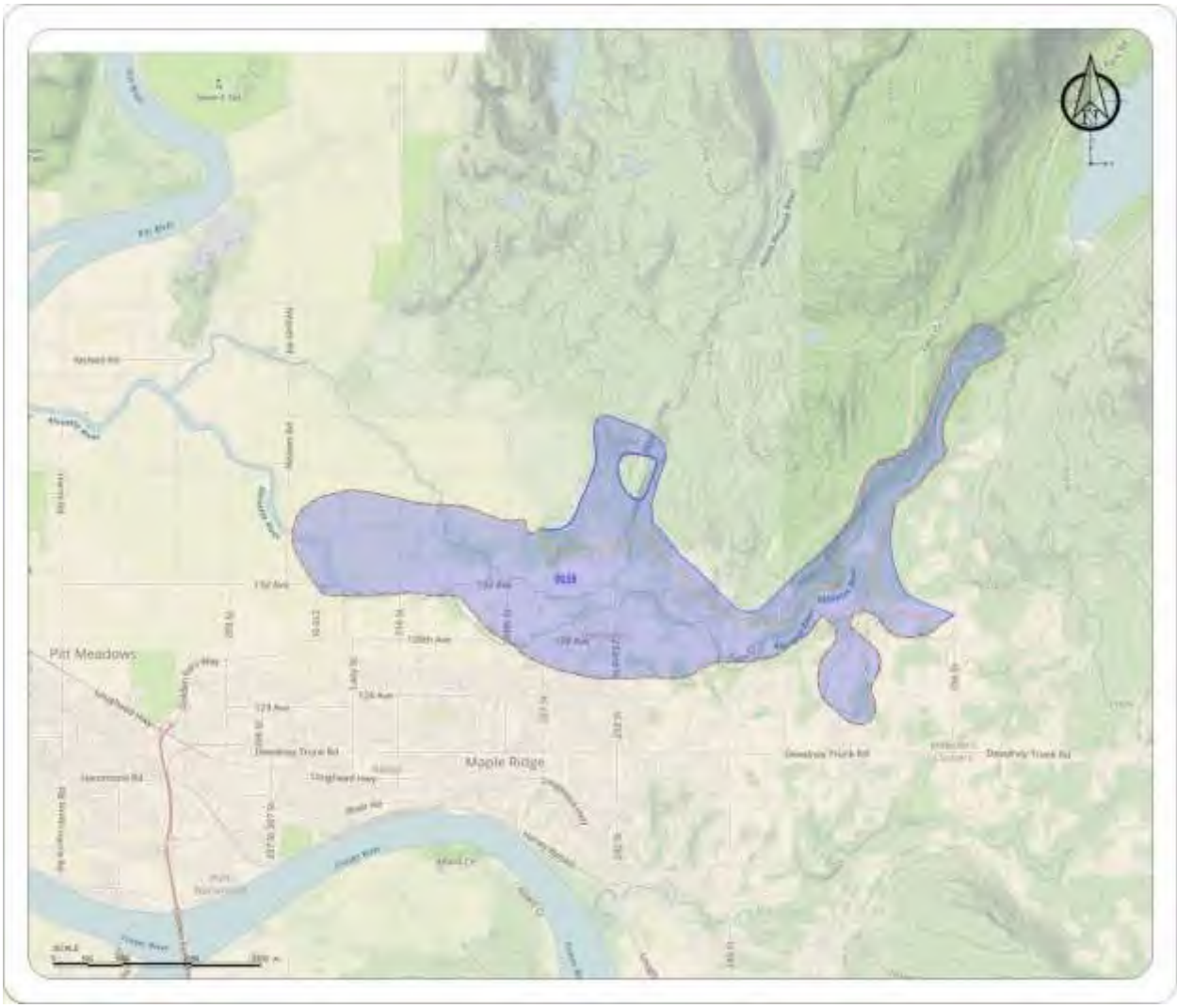
Level of Development	III (Low demand / moderate productivity)
Level of Vulnerability	B (Moderate)

Ranking Component:	***Ranking Value***
Productivity	2
Vulnerability	2
Size	2
Demand	1
Type of Use	2
Quality Concerns	0
Quantity Concerns	0
Total	**9**

Statistical Summary of Well Data for Aquifer # 0038

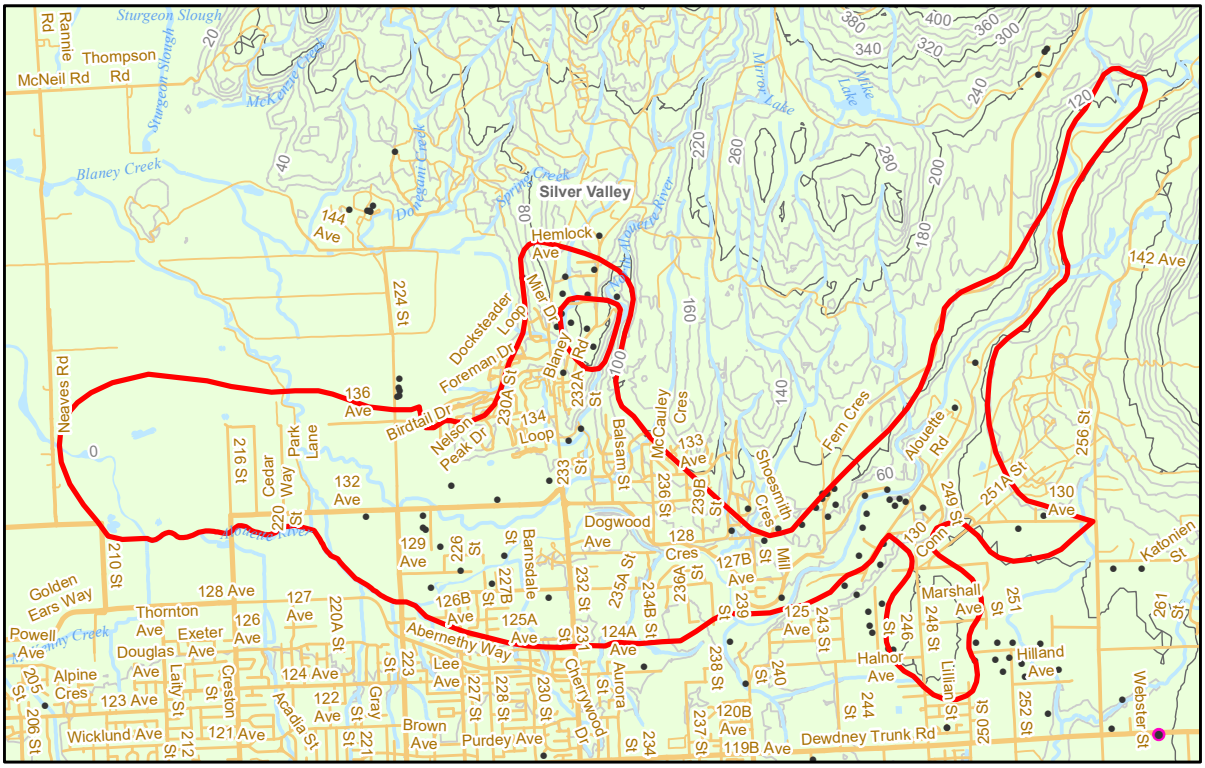
Total number of wells available for statistical analysis: **42**

	Well Depth [ft] ([m])	Water Depth [ft] ([m])	Bedrock Depth [ft] ([m])	Yield [USgpm] ([L/s])	Confining Thickness [ft] ([m])
N	41	34	4	27	27
Minimum	5 (1.5)	3 (0.9)	80 (24.4)	1.5 (0.09)	2 (0.6)
Maximum	334 (101.8)	161 (49.1)	95 (29.0)	81 (5.1)	140 (42.7)
Median	42 (12.8)	15 (4.6)	89 (27.1)	12 (0.8)	25 (7.6)
Arithmetic mean	46 (14.0)	33 (10.1)	88 (26.8)	17 (1.1)	41 (12.5)
Geometric mean	51 (15.5)	16 (4.9)	88 (26.8)	11 (0.7)	25 (7.6)




Fb
Fc
SAJ
FLJ
FLC
Se
Fc
RIVER

Aquifer #38



Legend

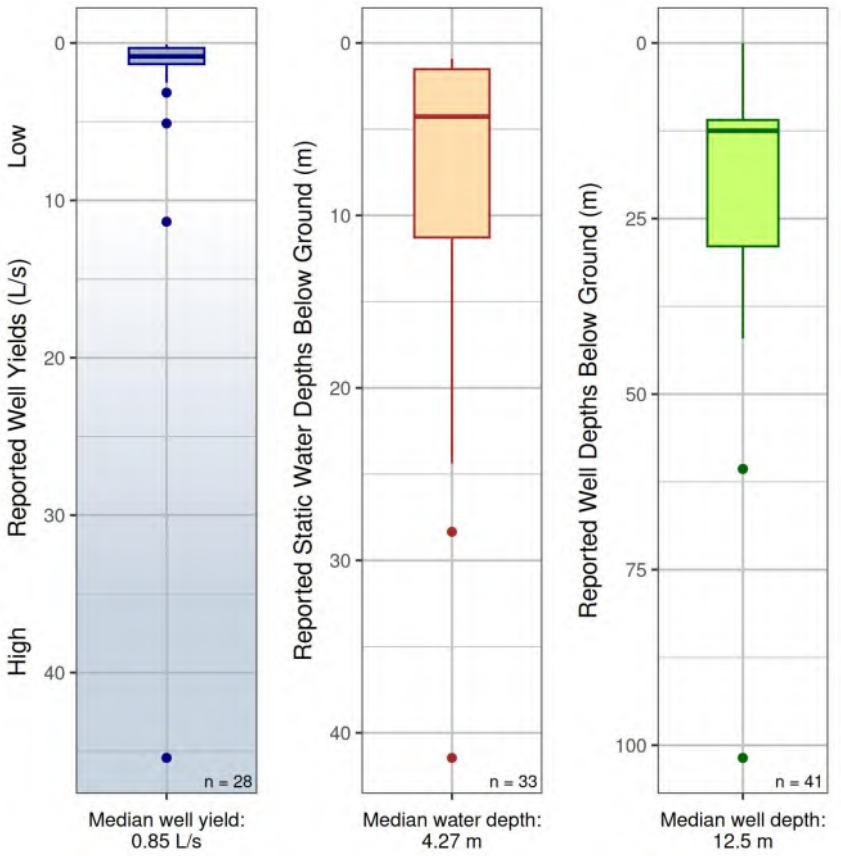
- Registered Water Well - Artesian
- Registered Water Well
- Aquifer Boundary

Aquifer Description (Mapping Report - 2016): Predominantly unconfined fluvial or glacio-fluvial sand and gravel aquifer found along rivers of moderate stream order with the potential to be hydraulically influenced by the river (subtype = 1b).

Aquifer Details	
Region	South Coast
Water District	New Westminster
Aquifer Area	16.9 km^2
No. Wells Correlated	41
Vulnerability to Contamination	Moderate
Productivity	Moderate
Aquifer Classification	IIIB
Hydraulic Conductivity *	Unknown
Transmissivity *	Unknown
Storativity *	Unknown
No. Water Licences Issued to Wells	Unknown
Observation Wells (**Active**, Inactive)	None

* min - max

For Hydraulic Connection see guidance document



Detailed methods for all figures are described in the companion document (Aquifer Factsheet - Companion Document.pdf).

Factsheet generated: 2025-03-26. Aquifers online: https://apps.nrs.gov.bc.ca/gwells/aquifers.

ACTIVE EARTH

APPENDIX B
Photographs

PHOTOGRAPHS

Photo 1: Eastern view of mapped wetland towards the northern boundary of the Study Area.

Photo 2: Frodo Creek.

Client Name	Site Location	Project No.	Date
The City of Maple Ridge	256 Street Industrial Lands, Maple Ridge	4725	August 2025

PHOTOGRAPHS

Photo 3: Unmapped tributary of Frodo Creek.

Photo 4: Confluence of unmapped tributary with Frodo Creek.

Client Name	Site Location	Project No.	Date
The City of Maple Ridge	256 Street Industrial Lands, Maple Ridge	4725	August 2025

PHOTOGRAPHS

Photo 5: Mature Mixed stand forest around the Alouette FSR and Frodo Creek.

Photo 6: Unmapped drainage ditch culvert parallel to Frodo Creek, north view.

Client Name	Site Location	Project No.	Date
The City of Maple Ridge	256 Street Industrial Lands, Maple Ridge	4725	August 2025

PHOTOGRAPHS

Photo 7: Unmapped drainage ditch culvert parallel to Frodo Creek, south view.

Photo 8: Mature mixed forest, east of Frodo Creek.

Client Name	Site Location	Project No.	Date
The City of Maple Ridge	256 Street Industrial Lands, Maple Ridge	4725	August 2025

PHOTOGRAPHS

Photo 9: Unmapped wetland, east of Frodo Creek.

Photo 10: Unmapped stream west of Frodo Creek, north of unmapped wetland (above).

Client Name	Site Location	Project No.	Date
The City of Maple Ridge	256 Street Industrial Lands, Maple Ridge	4725	August 2025

PHOTOGRAPHS

Photo 11: Mapped isolated pond (dry) west of 256 St, south of Frodo Creek.

Photo 12: Mapped flood hazard along 256 St.

Client Name	Site Location	Project No.	Date
The City of Maple Ridge	256 Street Industrial Lands, Maple Ridge	4725	August 2025

PHOTOGRAPHS

Photo 13: Mapped wetland (dry) near Websters Creek.

Photo 14: Unmapped wetland near Websters Creek.

Client Name	Site Location	Project No.	Date
The City of Maple Ridge	256 Street Industrial Lands, Maple Ridge	4725	August 2025

PHOTOGRAPHS

Photo 15: Mapped wetlands in southwest corner of the Study Area.

Photo 16: Mapped wetlands in southwest corner of the Study Area.

Client Name	Site Location	Project No.	Date
The City of Maple Ridge	256 Street Industrial Lands, Maple Ridge	4725	August 2025

PHOTOGRAPHS

Photo 17: Mapped wetlands in southwest corner of the Study Area.

Photo 18: Evidence of vernal ponds in previously reported wetlands.

Client Name	Site Location	Project No.	Date
The City of Maple Ridge	256 Street Industrial Lands, Maple Ridge	4725	August 2025

PHOTOGRAPHS

Photo 19: Unmapped culvert and unmapped 249 Street Creek.

Photo 20: Mapped non-fish bearing stream east of 249 Street

Client Name	Site Location	Project No.	Date
The City of Maple Ridge	256 Street Industrial Lands, Maple Ridge	4725	August 2025

PHOTOGRAPHS

Photo 21: Culvert at mapped stream east of 249 Street.

Photo 22: Unmapped stream between mapped streams east of 249 Street.

Client Name	Site Location	Project No.	Date
The City of Maple Ridge	256 Street Industrial Lands, Maple Ridge	4725	August 2025

PHOTOGRAPHS

Photo 23: Mapped stream entering 249 Street Creek (shown to terminate in mapping).

Photo 24: Mapped fish-bearing Creek east of 249 Street.

PHOTOGRAPHS

Photo 25: Unmapped stream entering 249 Street Creek.

Photo 26: Mapped wetland east of 249 St.

Client Name	Site Location	Project No.	Date
The City of Maple Ridge	256 Street Industrial Lands, Maple Ridge	4725	August 2025

PHOTOGRAPHS

Photo 27: Mapped culvert, non-fish passable, east of 249 Street.

Photo 28: Mapped stream, non-fish passable perched culvert, west of 249 Street.

Client Name	Site Location	Project No.	Date
The City of Maple Ridge	256 Street Industrial Lands, Maple Ridge	4725	August 2025

PHOTOGRAPHS

Photo 29: 249 Street Creek.

Photo 30: 249 Street Creek.

Client Name	Site Location	Project No.	Date
The City of Maple Ridge	256 Street Industrial Lands, Maple Ridge	4725	August 2025

PHOTOGRAPHS

Photo 31: Settlement ponds on southwest portion of large gravel pit in centre of Study Area

Photo 32: Vashon Drift sand and gravel exposed in large gravel pit in centre of Study Area

Client Name	Site Location	Project No.	Date
The City of Maple Ridge	256 Street Industrial Lands, Maple Ridge	4725	August 2025

PHOTOGRAPHS

Photo 33: Large gravel pit located at center of the Study Area , looking west

Photo 34: Drain tile outfall into ditch along north side of 130 Ave at 251A Street

PHOTOGRAPHS

Photo 35: Ponded at north gate to 14320 256 Street, west of active gravel pit

Photo 36: Iron staining, possibly from past flood events, on north side of 13120 256 Street

Client Name	Site Location	Project No.	Date
The City of Maple Ridge	256 Street Industrial Lands, Maple Ridge	4725	August 2025

PHOTOGRAPHS

Photo 37: Tributary to Websters Creek crossing 13120 256 Street

Photo 38: Wet soils on western portion of 13120 256 Street

Client Name	Site Location	Project No.	Date
The City of Maple Ridge	256 Street Industrial Lands, Maple Ridge	4725	August 2025

PHOTOGRAPHS

Photo 39: Operational gravel pit on northern portion of 25927 128 Avenue

Photo 40: Forested area near ALR lands on south portion of 25927 128 Avenue

Client Name	Site Location	Project No.	Date
The City of Maple Ridge	256 Street Industrial Lands, Maple Ridge	4725	August 2025

PHOTOGRAPHS

Photo 41: Settlement pond on south portion of 25927 128 Avenue

Photo 42: Culvert draining settlement pond on south portion of 25927 128 Avenue

PHOTOGRAPHS

Photo 43: Confirmed lake in northeast corner of the Site.

Photo 44: Big Lake, west of 256 Street.

Client Name	Site Location	Project No.	Date
The City of Maple Ridge	256 Street Industrial Lands, Maple Ridge	4725	August 2025

PHOTOGRAPHS

Photo 45: Confirmed wetland east of 256 Street in northeast corner of site.

Photo 46: Confirmed wetland east of 256 Street in northeast corner of site.

Client Name	Site Location	Project No.	Date
The City of Maple Ridge	256 Street Industrial Lands, Maple Ridge	4725	August 2025

PHOTOGRAPHS

Photo 47: Confirmed isolated wetlands on either side of 256 Street.

Photo 48: Confirmed isolated wetland east of 256 Street.

Client Name	Site Location	Project No.	Date
The City of Maple Ridge	256 Street Industrial Lands, Maple Ridge	4725	August 2025