

EDMONTON SKI CLUB RIVER VALLEY OUTDOOR ACTIVITY CENTER ENVIRONMENTAL IMPACT ASSESSMENT

Prepared for:

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EXECUTIVE SUMMARY

Edmonton Ski Club (ESC) has managed a ski centre in central Edmonton since 1911. ESC's original lodge was built in the 1940's, located at the north central region of Gallagher Park. Due to safety concerns and the building reaching end of life despite many modifications since the 1940's, it was demolished in the fall of 2022, with operations continuing out of modular trailers. A new River Valley Outdoor Activity Centre (RVOAC) (the project) is planned to begin construction to replace the temporary trailers, and provide a year-round facility for the ESC to operate from. The RVOAC will include redevelopment of the main facility, parking and access upgrades. The development of the new RVOAC falls under the guidance of the 20-year Concept Plan for Gallagher Park, which was approved to guide the development, preservation, and appreciation of Gallagher Park. As part of the process of developing the preferred Concept Plan multiple public engagement opportunities were initiated to solicit public feedback and suggestions, which were incorporated into the final Concept Plan. The public consultation process resulted in the development of preferred Concept Plan for Gallagher Park that focused in improving park amenities (i.e., improving trails and access points, signage, lighting and washroom facilities) with minimal change to the surrounding landscape and current uses of the park.

The project area falls within the North Saskatchewan River Valley Area Redevelopment Plan, it is subject to Bylaw 7188, which requires that an Environmental Impact Assessment (EIA) be completed for any development project within these boundaries. As such, Solstice Canada Corp. (Solstice) was retained by ESC to prepare this EIA to meet the requirements outlined in Bylaw 7188.

As the Gallagher Park EIA encompasses the project location, much of the data and information on baseline conditions are directly applicable to this project. Pertaining to the larger Gallagher Park, an initial Environmental Overview (Solstice 2019) was completed to identify environmental sensitivities and potential development concerns within the Gallagher Park Concept Plan area to help inform early-stage planning options, and develop a shared understanding of those sensitivities with City planners, public stakeholders and planning team members. Additionally, an EIA (Solstice 2021a) and Site Location Study (SLS) (Solstice 2021b) were completed for the Gallagher Park Concept Plan area. As the project area is located entirely within the footprint of the EIA study area for the Gallagher Park EIA, this report predominantly aligns with the results and analysis completed in the Gallagher Park EIA.

Based on the review of potential impacts anticipated to occur from the implementation of the ESC RVOAC project, it is expected that all potential negative residual impacts will be reduced to negligible with the application of the recommended mitigation measures.

Of the Valued Ecological Components (VEC's) that were identified, key environmental sensitivities that required further consideration included:

- Soil management, specifically soil erosion and sedimentation risk and management of historically contaminated soils,
- Groundwater impacts, specifically the potential for impacts from building pile drilling and installation of geothermal borefield,
- Potential for paleontological impacts in bedrock resulting from building pile drilling and installation of geothermal borefield,
- Native vegetation communities and integration of bioswales;
- Wildlife habitat and use.

Soil management, specifically management of historically contaminated soils will need to be addressed at future stages of the project and will require the development and implementation of a site-specific risk management plan if any contaminated soil materials are expected to be moved off site or reused, or if project activities will interact with contaminated materials. All other environmental sensitivities related to soil, groundwater native vegetation communities and wildlife can be effectively addressed through various

project controls and mitigation measures that will be implemented as the project proceeds to the next phases.

Overall, the project is expected to have a minimal effect on environmental resources and is expected to result in a net positive impact to several VECs, including surface water, vegetation and wildlife components through site regrading, establishment of new naturalized areas that will increase both local biodiversity and wildlife habitat. In that regard, we are of the opinion that the proposed ESC project can proceed as planned.

TABLE OF CONTENTS

| | |
|---|----|
| Signatures | i |
| Disclaimer..... | i |
| Executive Summary | ii |
| 1. Introduction..... | 1 |
| 2. Property Description..... | 2 |
| 2.1. Study Area..... | 2 |
| 2.2. Zoning | 2 |
| 2.3. Land Ownership | 2 |
| 2.4. Existing and Historical Land Use | 2 |
| 2.5. Relevant Federal, Provincial, and Municipal Legislation | 5 |
| 3. Environmental Assessment Methods..... | 9 |
| 3.1. Literature Review | 9 |
| 3.2. Field Surveys..... | 9 |
| 3.3. Wildlife Connectivity Mapping | 10 |
| 4. Environmental Baseline Conditions | 11 |
| 4.1. Surface Water | 11 |
| 4.2. Groundwater..... | 11 |
| 4.3. Surface Composition and Geology (landform)..... | 12 |
| 4.4. Soils and Geomorphology..... | 12 |
| 4.5. Vegetation | 15 |
| 4.5.1. Vegetation and Wetland Communities..... | 15 |
| 4.5.2. Species Diversity..... | 16 |
| 4.5.3. Rare Plants..... | 16 |
| 4.5.4. Weed Observations..... | 17 |
| 4.6. Wildlife..... | 20 |
| 4.6.1. Expected Species within the Study Area and Expected Habitat Usage | 26 |
| 4.6.2. Wildlife Connectivity | 26 |
| 4.7. Fish Habitat | 28 |
| 4.8. Historic Resources | 29 |
| 5. Project Design..... | 30 |
| 5.1. Project Design Overview..... | 30 |
| 5.2. General Project Phasing and Consideration of Environmental Sensitivities | 30 |
| 6. Project Impacts and Mitigation Measures | 31 |
| 6.1. Environmental Impact Assessment Methods..... | 31 |
| 6.1.1. Impact Identification and Analysis..... | 31 |

| | | |
|--------|---|----|
| 6.1.2. | Impact Assessment Criteria and Evaluation | 31 |
| 6.2. | Assessment of Project Environmental Impacts and Associated Mitigation | 32 |
| 6.2.1. | Surface Water | 32 |
| 6.2.2. | Groundwater..... | 34 |
| 6.2.3. | Soils and Geomorphology..... | 34 |
| 6.2.4. | Vegetation | 37 |
| 6.2.5. | Wildlife..... | 40 |
| 6.2.6. | Unanticipated Discoveries Associated with Archaeological or Cultural/Historical Resources | 43 |
| 6.3. | Assessment of Cumulative Environmental Impacts..... | 43 |
| 7. | Environmental Monitoring | 44 |
| 8. | Public Consultation | 44 |
| 9. | Conclusions..... | 45 |
| 9.1. | Summary of Environmental Impacts and Sensitivities..... | 45 |
| 9.2. | Assessment Limitations and Key Mitigation Measures..... | 45 |
| 10. | References..... | 47 |

LIST OF TABLES

| | | |
|------------------|---|----|
| TABLE 1. | Summary of Applicable Legislation and Bylaws..... | 5 |
| TABLE 2. | Soil Map Unit Descriptions | 14 |
| TABLE 3. | Summary of Vegetation Community Types in the Study Area | 16 |
| TABLE 4. | Prohibited Noxious and Noxious Weed Populations..... | 18 |
| TABLE 5. | FWIMIS Wildlife Observations from a 3-km Search Radius..... | 21 |
| TABLE 6. | Wildlife Observations from Solstice Site Assessments | 22 |
| TABLE 7. | Wildlife Feature Observations From 2023..... | 23 |
| TABLE 8. | Summary of Expected Wildlife Species in the Parkland Natural Region and Within 100 km of the City of Edmonton | 25 |
| TABLE 9. | FWIMIS Aquatic Observation Records from the North Saskatchewan River..... | 28 |
| TABLE 10. | Historic Resource Listings by Legal Subdivision..... | 29 |
| TABLE 11. | Project Interaction Table..... | 30 |
| TABLE 12. | Assessment Criteria for Environmental Impact Assessment..... | 32 |

LIST OF FIGURES

| | | |
|------------------|---|----|
| FIGURE 1. | Study Area Location | 4 |
| FIGURE 2. | Dominant Vegetation Communities and Rare Plant Locations | 19 |
| FIGURE 3. | Wildlife Incidental Observations | 24 |
| FIGURE 4. | Winter Tracking Transects..... | 25 |
| FIGURE 5. | Coyote Habitat Connectivity in the Summer Considering the Proposed Concept of Gallagher Park and Area | 26 |
| FIGURE 6. | Coyote Habitat Connectivity in the Winter Considering the Proposed Concept of Gallagher Park and Area..... | 27 |
| FIGURE 7. | Black-Capped Chickadee Habitat Connectivity in the Summer Considering the Proposed Concept of Gallagher Park and Area..... | 27 |

LIST OF APPENDICES

- APPENDIX A.** Species Tables
- APPENDIX B.** Representative Site Photographs
- APPENDIX C.** Plans

1. INTRODUCTION

Edmonton Ski Club (ESC) has managed a ski centre in central Edmonton since 1911. ESC's original lodge, located at the base of Gallagher Park was built in the 1940's. Due to safety concerns and the building reaching end of life despite many modifications since the 1940's, it was demolished in the fall of 2022, with operations continuing out of modular trailers. A new River Valley Outdoor Activity Centre (RVOAC) (the project) is planned to begin construction to replace the temporary trailers, and provide a year-round facility for the ESC to operate from. The RVOAC will include redevelopment of the main facility, parking and access upgrades. The development of the new RVOAC falls under the guidance of the 20-year Concept Plan for Gallagher Park, which was approved to guide the development, preservation, and appreciation of Gallagher Park. As part of the process of developing the preferred Concept Plan multiple public engagement opportunities were initiated to solicit public feedback and suggestions, which will be incorporated into the final Concept Plan. The public consultation process resulted in the development of preferred Concept Plan for Gallagher Park that focused in improving park amenities (i.e., improving trails and access points, signage, lighting and washroom facilities) with minimal change to the surrounding landscape and current uses of the park.

The project area falls within the North Saskatchewan River Valley Area Redevelopment Plan, it is subject to Bylaw 7188, which requires that an Environmental Impact Assessment (EIA) be completed for any development project within these boundaries. As such, Solstice Canada Corp. (Solstice) was retained by the ESC to prepare this EIA to meet the requirements outlined in Bylaw 7188.

As the Gallagher Park EIA encompasses the project location, much of the data and information on baseline conditions within this EIA are directly applicable to the project. Pertaining to the larger Gallagher Park, an initial Environmental Overview (Solstice 2019) was completed to identify environmental sensitivities and potential development concerns within the Gallagher Park Concept Plan area to help inform early stage planning options, and develop a shared understanding of those sensitivities with City planners, public stakeholders and planning team members. Additionally, an EIA (Solstice 2021a) and Site Location Study (SLS) (Solstice 2021b) were completed for the Gallagher Park Concept Plan area. As the project area is located entirely within the footprint of the EIA study area for the Gallagher Park EIA, this report will align with the results and analysis completed in the Gallagher Park EIA. A site visit was completed by Solstice as part of the RVOAC EIA on October 4th, 2023 to further characterize and describe dominant vegetation, soil conditions and incidental wildlife observations within the RVOAC project footprint

As part of the EIA process, potential environmental impacts associated with various project components related to were assessed relative to the selected VECs. The EIA content and format follows the Terms of Reference provided by the City of Edmonton (the City). The Valued Ecosystem Components (VECs) identified for evaluation in this EIA aligned with those evaluated in the Gallagher Park EIA (Solstice 2021a). The selected VECs included:

- Groundwater,
- Surface water,
- Fish and fish habitat,
- Geology,
- Geomorphology,
- Soils,
- Vegetation,
- Wildlife, and
- Historical resources.

2. PROPERTY DESCRIPTION

2.1. STUDY AREA

The project physical disturbance footprint falls within ESC's lease area (7.45 ha) as defined in the License Agreement dated September 14, 2022 with the City of Edmonton. Portions of the footprint that fall outside of leased area include the commercial crossings at the facility entrances and a bioswale. The project footprint is anticipated to cover 0.51 ha and includes a new carbon neutral and high energy efficiency main lodge facility, which will include solar and geothermal infrastructure, event space, meeting facilities, and administration space. The project will also include upgrading surface water drainage, installation of a gravel parking lot with asphalt aprons at the entrances from 96 avenue, and bioswale infrastructure. The study area defines the area that will be evaluated for physical effects of the project. The study areas evaluated in relation to VECs is detailed within Section 3 and 4, relative to the project boundary, including:

- Surface water - 300 m,
- Groundwater and Geomorphology - 300m,
- Vegetation - 100 m, and
- Wildlife - 3 km.

To address indirect effects of the project, potential impacts to adjacent lands were also considered, including the North Saskatchewan River (NRS) and its associated valley, and of the ESC's leased area that reside outside the project area and Gallagher park.

The study area is located near downtown Edmonton, just south of the Cloverdale neighbourhood. The project falls within Legal Subdivisions 7 and 10, 33-52-24 W4M. The ESC is located at 9613- 96 Avenue NW at the base of Gallagher Park hill. Gallagher Park is bordered by 98th Avenue to the north, Connors Road to the south, and Cloverdale Hill Road to the east (Figure 1). The neighborhood of Cloverdale lies on the northern edge of the park. A proposed site plan is presented in Appendix C.

The following municipal facility lies within the study area:

- Gallagher Park – 9505 96 Avenue NW

The Legal Subdivision that is captured partially within this area is Lot 1, Block 7 of Plan 152 2550.

2.2. ZONING

The study area is comprised of two different types of land use zones. Most of the study area is Metropolitan Recreation Zone (i.e. Zone A). The areas included under this designated zoning include much of Gallagher Park. The west side of the study area also falls within a Public Parks Zone and "AN", a River Valley Activity Node Zone, located to the west of 96a St SW (City of Edmonton 2023b).

2.3. LAND OWNERSHIP

The study area is entirely owned by the City of Edmonton. However, the ESC has a license for 7.45 ha of central Gallagher Park, predominantly on the north facing slope of Gallagher Hill.

2.4. EXISTING AND HISTORICAL LAND USE





Prior to colonization, the study area was an important travel corridor for First Nations who resided and traded in the area and later the river would serve as an important corridor for travel during the Fur Trade for traders and trappers headed to Fort Edmonton. Later, during early European settlement, the study area supported agricultural ventures due to the fertile soils on the riparian terraces along the NSR. The area eventually became a center for industry, including businesses such as brick yards, coal mines, and lumber yards. During the Great Depression, the Mill Creek Incinerator was erected where the Muttart

Conservatory stands today. The incinerator operated from the 1930's to 1971. The surrounding area encompassing much of Gallagher Park was used to store refuse that was to be incinerated.

Gallagher Park, previously called Grassy Hill, was renamed to honour Mayor Gallagher of Edmonton after the incinerator and dump were closed. The ESC, formed in 1911, continues operation on Connors Hill within Gallagher Park. The closure of the dump and incinerator allowed for conversion to recreation land use in the area. Following the closures and cleanup of the incinerator infrastructure, the Muttart Conservatory was erected in 1976, roughly on the same location where the incinerator stood. Later, the Edmonton Folk Music Festival would begin hosting their annual music event within Gallagher Park in 1981. Both the music festival and Conservatory continue to operate within Gallagher Park.

In 2023, Solstice completed a Phase 1 Environmental Site Assessment (ESA) for the project area. The recommendations of the Phase I ESA included further evaluation of soil and groundwater impacts have been confirmed in the immediate vicinity of the subject site from the activities of the historic Cloverdale incinerator and landfill that was located within the same city lot. It is recommended that a Phase II ESA should be conducted for metals and PAHs in soil, and dissolved metals, routine parameters, and PAHs in groundwater. Additionally, per-and polyfluoroalkyl (PFA) substances should be assessed at this site as they are potential contaminants at landfills.



- LEGEND**
-  Project Footprint
 -  EIA Study Area
 -  Boundary of Licensed Premises
 -  LSD Boundary

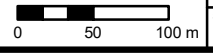


**EDMONTON SKI CLUB
EIA STUDY AREA LOCATION**

| | | |
|----------------------------|------------------------|-----------------|
| DATE: NOVEMBER 08, 2023 | PROJECTION: 3TM 114 | DATUM: NAD83 |
|----------------------------|------------------------|-----------------|

| |
|------------------------------|
| PROJECT CODE: 22-13630-25 |
| SCALE: 1:5,000 |

FIGURE 1



SOURCES:
PROJECT FOOTPRINT APPROXIMATE FROM 2023-10-31 - 6013 - SITE PLAN.DWG, GEC ARCHITECTURE, OCT. 31, 2023.
ESRI, MAXAR, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRIID, IGN, AND THE GIS USER COMMUNITY.

2.5. RELEVANT FEDERAL, PROVINCIAL, AND MUNICIPAL LEGISLATION

Gallagher Park, and the activities that are permitted within the area, are guided by several policies. These policies include the City of Edmonton's Open Space Policy, the North Saskatchewan River Valley Redevelopment Plan, the Cloverdale Area Redevelopment Plan, and the City of Edmonton's Municipal Development Plan. The municipal policies and bylaws taken into consideration as part of the EIA are listed in Table 1. These policies and bylaws will inform future planning decisions and will set the legislative framework for this environmental impact assessment for proposed conceptual planning options, under Edmonton Bylaw 7188.

In addition to the above City policies and bylaws, a number of Provincial and Federal regulatory requirements were also taken into consideration as part of the assessment process (Table 1).

TABLE 1. Summary of Applicable Legislation and Bylaws

| Legislation, Policy, or Bylaw | Responsible Authority | Purpose or Intent | Anticipated Regulatory Requirement |
|---------------------------------------|-----------------------------------|---|--|
| Federal | | | |
| <i>Fisheries Act</i> | Fisheries and Oceans Canada (DFO) | To prevent the harmful alteration, degradation or destruction of fish or fish habitat, including release of deleterious substances to fish habitat. | Proximity to Mill Creek and NSR requires implementation of appropriate mitigation measures to avoid potential release of deleterious substances. |
| <i>Migratory Birds Convention Act</i> | Environment Canada | The protection and conservation of migratory bird individuals and populations, their nests, and habitats. | <p>Respect clearing restrictions during the breeding season, which for the Edmonton area falls within the B4 nesting zone that has a migratory breeding bird period of approximately April 14th to August 28th. If construction is to occur during the breeding season period, a nest sweep should be conducted by a qualified wildlife specialist to confirm if nests are present and establish required setbacks, if needed.</p> <p>The dates of the anticipated nesting season are a guideline; if nesting or nesting behavior is observed outside the breeding bird season, activities should be halted until appropriate mitigations can be put in place. Any unoccupied nests belonging to species on Schedule 1 (pileated woodpecker) are to be reported through the abandoned nest registry.</p> |

| Legislation, Policy, or Bylaw | Responsible Authority | Purpose or Intent | Anticipated Regulatory Requirement |
|---|--|---|--|
| <i>Species at Risk Act</i> | Environment Canada | To prevent the extirpation or extinction of wildlife species, as well as to provide for the recovery of species currently at risk due to human activity, and to prevent species of special concern from becoming at risk. Protection of individuals or their critical habitat from disturbance or damage during construction. may result in Penalties. | Schedule 1 species are not anticipated to be impacted by project activities. |
| Provincial | | | |
| <i>Water Act</i> | Alberta Environment and Protected Areas (AEPA) | To promote the conservation and management of water in Alberta, including wetlands. | Project activities will not have impacts to watercourses/waterbodies. |
| <i>Alberta Wetland Policy</i> | Alberta Environment and Protected Areas (AEPA) | To conserve, protect, and restore Alberta's wetlands to sustain the ecosystem services and benefits associated. | Project activities will not have impacts to wetlands. |
| <i>Soil Conservation Act</i> | Alberta Environment and Protected Areas (AEPA) | Requirement to prevent soil loss or deterioration from taking place or to stop loss or deterioration from continuing | Applicable. |
| <i>Environmental Protection and Enhancement Act</i> | Alberta Environment and Protected Areas (AEPA) | To support and promote the protection, enhancement and use of the environment | Compliance during construction activities is required to prevent release of contaminants to land, water, or air and to reclaim and revegetate any disturbances to equivalent land capability or condition. |
| <i>Public Lands Act</i> | Alberta Environment and Protected Areas (AEPA) | To manage and protect Crown owned land for sustainable use, including the bed and shores of all waterbodies | Not applicable to the project location and proposed works. |

| Legislation, Policy, or Bylaw | Responsible Authority | Purpose or Intent | Anticipated Regulatory Requirement |
|---|--|---|--|
| <i>Wildlife Act</i> | Alberta Environment and Protected Areas (AEPA) | Protection of plants and wildlife species in the province, including harvest or hunting, and management of species at risk | <p>Compliance is required during construction to prevent harm to listed wildlife or plant species. Vegetation clearing should aim to avoid the breeding bird nesting period for this area (April 14th to August 28th), as well as the raptor nesting period from February 15th to August 15th.</p> <p>Wildlife sweeps and wildlife surveys will be required to identify protected wildlife, their habitat and protected wildlife features.</p> |
| <i>Historic Resources Act</i> | Alberta Culture and Tourism | Provides for the use, designation and protection of moveable and immoveable historic resources | <p>Potential requirement for approval as portions of the study area contain Historic Resource listings. An Historical Resources screening should be undertaken to determine if an Historical Resources Impact Assessment (HRIA) and Historic Resources Act (HRA) approval may be required.</p> <p>All discoveries of paleontological or archaeological resources should be reported as required by the <i>Historical Resources Act</i>.</p> |
| Municipal | | | |
| <i>North Saskatchewan River Valley Area Redevelopment Plan (Bylaw 7188)</i> | City of Edmonton | To protect the North Saskatchewan River Valley and Ravine System as part of Edmonton's valuable open space heritage and to establish the principles for future implementation plans and programs. | EIA and SLS are required and must be approved by the City Council. |
| <i>Open Space Policy (C594)</i> | City of Edmonton | Inform the planning, design and management of Edmonton's open space to achieve the outcomes and realize the vision of an integrated, sustainable, vibrant and multifunctional green network. | Compliance and unanimity with the Policy is required. |

| Legislation, Policy, or Bylaw | Responsible Authority | Purpose or Intent | Anticipated Regulatory Requirement |
|--|-----------------------|--|--|
| <i>Cloverdale Area Redevelopment Plan (Bylaw 7972)</i> | City of Edmonton | Outlines land use planning for existing City-level public facilities, such as the Muttart Conservatory, the Edmonton Ski Club, and the Edmonton Folk Music Festival. The plan's objectives include the maintenance of recreation opportunities/facilities for the future, including increasing capacity, while also minimizing any negative outcomes from such facilities. | Compliance and unanimity with the Policy is required. |
| <i>City of Edmonton Municipal Development Plan (Bylaw 15100)</i> | City of Edmonton | Guide future development across the City and set a goal of increasing parkland and access. The plan also discusses the alteration of use or operation of park areas to meet recreational, social, educational, or environmental needs. | Compliance and unanimity with the Policy is required. |
| <i>Corporate Tree Management Policy (C456)</i> | City of Edmonton | The purpose of this policy is to ensure growth, sustainability, acquisition, stewardship, tree maintenance, protection and preservation of the City of Edmonton Urban Forest | There is a requirement for adherence to the Policy, including development and implementation of a Tree Preservation Plan. Compensation for loss of canopy and ornamental trees must be addressed in agreement with the City. |

3. ENVIRONMENTAL ASSESSMENT METHODS

3.1. LITERATURE REVIEW

Descriptions of baseline conditions were completed using existing environmental assessments were compiled and reviewed, as well as other existing resources such as provincial monitoring databases. Materials were reviewed for relevant information; however, only the applicable information was utilized. Additional information and resources were referenced when gaps in reporting were noted or to update environmental information. These additional resources included Government of Alberta databases and web-based tools.

Specifically, a review of current environmental conditions within the study area was based on previous reporting conducted within the study area. In particular, the following reports and databases were referenced:

- Valley Line-Stage 1 LRT Project Environmental Impact Screening Assessment (Spencer Environmental 2013),
- City of Edmonton Environmental Sensitivities Mapping Project (Solstice 2017),
- Tier 2 Risk Assessment: Muttart Conservatory/Gallagher Park (AECOM 2017),
- Gallagher Park Concept Plan Environmental Overview (Solstice 2019),
- Gallagher Park Concept Plan, Environmental Impact Assessment (Solstice 2021a),
- Gallagher Park Concept Plan Site Location Study (Solstice 2021b),
- Short term Risk management Plan for the Construction of the Muttart Conservatory Building – Gallagher Park (COE 2016)
- Geotechnical Investigation- ESC-River Valley Outdoor Activity Centre, Dated September 25, 2023 (Shelby 2023),
- Alberta Fish and Wildlife Management Information System (FWMIS c2023), and
- Alberta Conservation Information Management System (ACIMS c2023).

Other materials that were reviewed and found not to be applicable for the study area, mainly due to their focus on upstream sections of Mill Creek and Mill Creek Park.

3.2. FIELD SURVEYS

As part of the Gallagher Park Concept Plan EIA (Solstice 2021a) a rare plant survey was completed by Solstice on July 18, 2019 to confirm the presence of rare or listed plant species within undisturbed portions of Gallagher Park, focusing on the wooded area east of Cloverdale Hill Road and 91 Street. Prior to completing the rare plant survey, existing records of rare plants in the area were obtained through a search of the ACIMS database, the Valley Line-Stage 1 LRT Project Environmental Impact Screening Assessment (Spencer Environmental 2013), and conversations with other professionals with experience conducting rare plant surveys in the Edmonton River Valley. Rarity was defined using the most recent ACIMS subnational rankings (S-ranks). Previous rare plant survey methodologies for the area were followed, which consider S1, S2, and S3 species to be species of interest. The rare plant survey was conducted by an experienced rare plant specialist using methods recommended by the Alberta Native Plant Council (ANPC 2012). The study area was traversed with meandering transects to confirm the presence of previously identified rare plant species and document any other rare plant species that may be present.

As part of the Gallagher Park Concept Plan EIA, Solstice also completed a site visit on September 3, 2020 to characterize and describe the dominant vegetation in the study area and to collect incidental wildlife observations. The vegetation survey focused on collecting general vegetation data for mapped vegetation communities identified through the Urban Primary Land and Vegetation Inventory (UPLVI) (City of Edmonton 2014). Qualified personnel recorded vegetation species within 1x1 m plots for ground

cover and 10x10 m plots for shrub and tree cover. Additional sampling points were completed to capture vegetation communities not listed within the UPLVI. Vegetation species were recorded by survey point and later referenced against community description within the UPLVI and any incidental wildlife observations were also recorded, along with representative site photographs. Plant species identified during the two field surveys completed by Solstice are presented in Appendix A and representative photographs of each mapped vegetation community are presented in Appendix B.

A site visit was completed by Solstice as part of the RVOAC EIA on October 4th, 2023 to further characterize and describe dominant vegetation, soil conditions and incidental wildlife observations within the RVOAC project footprint. Vegetation characterizations were recorded by survey point and later referenced against community descriptions within the UPLVI interpretation manual (2014) and field guide (2015) and any incidental wildlife observations were also recorded, along with representative site photographs.

Winter tracking surveys were also completed on along two pre-determined transects on January 19 and 25, 2024 (Figure 4). Transect locations were chosen to capture wildlife use of existing habitat adjacent to the project footprint, and situated so as to minimize anthropogenic disturbance of wildlife tracks given the public use of the area (i.e., ski hill, city park with walking trails, and adjacent residential area). Surveys were completed within two to six days after a track obliterating event (at least 1 cm of fresh snowfall) by an experienced wildlife biologist. Within each 50 m segment of the transect, a count of wildlife passes and trails were recorded for each species or species group. A wildlife pass was defined as tracks that intercepted the transect (within 1 m) or crossed it; a pass was considered the same individual until the tracks were out of sight of the observer following the transect. A trail was counted if five or more overlapping passes were in the same location, or if the number of passes could not be determined. Anthropogenic features and use were also noted for each segment. Any wildlife features (e.g., nests, dens, cavities) and incidental wildlife observations were also recorded.

3.3. WILDLIFE CONNECTIVITY MAPPING

Wildlife connectivity mapping was updated from an analysis of City-wide wildlife connectivity, which was part of the City of Edmonton Environmental Sensitivities mapping project (Solstice 2017). The connectivity mapping was created using predictive modeling based in the open-source software CircuitScape, using two indicator species, black-capped chickadee and coyote, to represent arboreal and terrestrial routes of movement.

CircuitScape uses principles based in electrical-circuit flow theory, using circuit and resistor analysis to map out movement corridors (like an electrical circuit), identify pinch points and locate potential restoration areas. It can also identify core areas by comprehensively mapping the ecological network of an area. This software has additional advantages in that it can be applied to single or multiple species of management concern, and does not require confirmation through independent, field-confirmed data (Koen et al., 2014), although predictions are improved with locally relevant habitat use data (LaPoint et al. 2013). With fine-resolution vegetation mapping, across natural areas and the developed landscape of the City, and locally relevant understanding of animal behavior in such landscapes, we can identify key corridors useful to various wildlife species.

CircuitScape uses a raster-based analysis that is based on assignment of habitat permeability scores to vegetated areas, barriers, and smaller connective features (e.g., culverts) relevant to a given wildlife species. The resulting output describes landscape permeability for a study species (or suite of species) by scoring useful habitat, linkages, matrix lands and barriers. Assignment of permeability is the key to a reliable analysis using the software, and particularly when data will be used for fine-scale planning decisions. Although generalized approaches for a suite of species have been done (Koen et al. 2014), ideally the analysis reflects locally relevant information about target wildlife species (Spear et al. 2010; Beier et al. 2011; Zeller et al. 2012, LaPointe et al. 2013). In some cases, barriers are obvious (e.g., highways and arterial roads, housing footprints and very steep terrain). Other landscape features may

have reduced permeability and must be evaluated relative to other habitat choices; weightings are more realistic with data relevant to a given species and local context (LaPoint et al. 2013). Although landscape level planning can proceed with coarse-resolution inputs (Beier and Brost 2010), for fine-scale planning activities, high resolution habitat and barrier data are also required (LaPoint et al. 2013). Because fine-scale data were available for this analysis, the results of this analysis were hoped to be sufficient for land use planning at the City level.

As noted above, the Environmental Sensitivities mapping project used two indicator species representative of Edmonton's wildlife community, the coyote (*Canis latrans*) and the black-capped chickadee (*Poecile atricapillus*). Both have locally relevant information on habitat use that can be modelled at a fine scale with relative confidence, particularly with the fine-resolution vegetation and urban infrastructure mapping available for this project. Further, because both are relatively common in Edmonton, and are known to move through native and non-native habitats, they can serve as good indicators of the connectivity now provided by the vegetated areas of the City, to help evaluate the role of such sites in Edmonton's ecological connectivity.

In 2019 Solstice updated the connectivity model mapping for these two species within Gallagher Park, specifically adding in the new LRT infrastructure (Solstice 2019). The study area for the connectivity analyses was narrowed to the study area laid out for the Gallagher Park Concept Plan (Solstice 2021a). Connectivity mapping was then updated with new or confirmed barriers and passageways within the area, namely the Valley Line-Stage 1 LRT and the wildlife corridor culvert at the top of Connors Hill. The final habitat connectivity models were created by reworking these features into the respective species-specific analyses.

Wildlife connectivity mapping assumptions were reviewed and compared to field observations during the October 4, 2023 site assessment. The October 4, 2023 site assessment confirmed that the connectivity model mapping remains valid, as minimal changes to overall vegetation community structure and local development has occurred.

4. ENVIRONMENTAL BASELINE CONDITIONS

4.1. SURFACE WATER

The study area does not have any notable surface water present within the potential physical disturbance boundary. The NSR lies within 525 m of the northern potential physical disturbance boundary. The project area is also near the old creek channel of Mill Creek, which was isolated when 98th Avenue and the associated bridges were constructed and the section of the creek channel within the study area was infilled. The isolated channel of Mill Creek is approximately 375 m north of the study area boundary, in Henrietta Muir Edwards Park (HME Park). Mill Creek appears to provide stormwater management in the form of storage and drainage (Spencer Environmental 2013). The Alberta Government's Flood Hazard online tool (AEP c2020) indicates that the project area is located over 200 m outside the flood fringe area, as defined as the 1:100 year flood level elevation.

4.2. GROUNDWATER

Within the study area, two groundwater regimes were identified by Thurber Engineering (2012): a perched water table and a deeper water table within the bedrock below. Below Connors Hill, depths of the water table were found to vary between 3.9 and 14.4 m below ground surface (bgs). Further groundwater information was present within the Risk Management Plan (RMP) created for the area by AECOM Canada Ltd. (AECOM 2017). This report found groundwater depths to be between 4.8 and 13.3 m bgs. The shallow groundwater levels were thought to be contiguous with the river water level (i.e., for groundwater not trapped in bedrock). Groundwater was found to flow predominately north with a northeast counterpart. The northern direction of groundwater flows appeared to follow the filled in former

watercourse path of Mill Creek on the west side of Gallagher Park.

Both the Valley LRT Report (Spencer Environmental 2013) and the RMP (AECOM 2017) identified groundwater contamination within Gallagher Park. However, soil and groundwater contamination is contained to areas south of the Muttart Conservatory and west of 96A Street, where the historic Cloverdale incinerator and landfill site was situated. The area of contamination lies just outside the western boundary of potential project impacts. Both reports stated exceedances for Polycyclic aromatic hydrocarbons (PAHs), various metals, and salts. The RMP reported chloride concentrations varying from 6 to 1,530 mg/L, but due to de-icer use on the surrounding pavement, chloride was not assumed to be a reliable indicator of contamination. Metals, such as boron, mercury, copper, uranium, and zinc were found to be present, and above Tier 1 Guidelines. PAHs were identified in monitoring wells that were drilled through fill materials. Debris, such as glass, brick, wood chips, and concrete were encountered when establishing these wells and these debris materials were thought to be the contributing factor to PAH presence within groundwater. The PAHs found in groundwater were in exceedance of the Freshwater Protection of Aquatic Life Guidelines. These exceedances are of concern due to the likelihood of groundwater discharge into surface waterbodies, such as Mill Creek and the NSR. However, no exceedances were noted to occur east of 96A Street, or further east along Connors Road (AECOM 2017).

The 2023 Shelby Engineering Geotechnical Report for the ESC RVOAC, dated September 25 2023, estimates the current stabilized groundwater to occur at a depth of 8.85 m bgs, with a potential range between 10-12 m bgs based on the elevation of the NSR. The report anticipates seepage to occur at minimum depths of 5.5 m bgs. Drilling logs did not document any debris in the fill underlying the study area. Groundwater conditions were not sampled or assessed due to dry conditions in the monitoring wells following installation (Shelby 2023).

The Addendum to the Phase 1 ESA conducted for the project area (Solstice 2023b) identified that based on groundwater depths within the project area provided in Shelby (2023) (i.e. 8.0 mbgs), groundwater impacts are unlikely to cause impacts to surface receptors at the site.

4.3. SURFACE COMPOSITION AND GEOLOGY (LANDFORM)

The study area is in a region that consists of the Horseshoe Canyon Formation, comprised of sandstone, siltstone, and containing coal seams, ironstone beds, and bentonite beds (Andriashek 1988). The formation is Cretaceous-aged (Andriashek 1988). Investigations within the localized stratigraphy found topsoil comprised of gravel, sand, clay, and silt, and clay fill between 1.8 to 13.9 m bgs. Bedrock was comprised of clay shale or sandstone, both with and without coal seams, from 9.2 to 16.8 m bgs (AECOM 2017). Bedrock was shallow near the top slope of Connor's Hill, where surficial deposits were also thin. Here bedrock was within 0.5 to 2.0 mbgs (Spencer Environmental 2013).

Thirteen bore holes were documented in the 2023 Shelby Engineering 2023 Geotechnical Report for the ESC RVOAC (Shelby 2023). The 2023 Shelby investigation encountered surficial fill underlain by clay, followed by sand and clay till. Surficial fill consisted of topsoil, sand and gravel ranged from depths of 300mm to 1.5m bgs.

4.4. SOILS AND GEOMORPHOLOGY

The study area lies in the NSR floodplain, which is comprised of lower-lying ground with deposits of river sediments deposited from intermittent flooding. This part of the river valley has steep valley walls delineating the floodplain extent, achieving a terraced formation created by past deposition and erosion events (Spencer Environmental 2013). Gallagher Park has been subject to large scale surface disturbances and filling events, altering the natural landforms of the area. Buried waste associated with the former incinerator site located west of the Study Area, near the current Muttart Conservatory lies under parts of this slope (AECOM 2017).

The project area is located at the base of Connor's Hill, located on a relatively flat portion of Gallagher Park. Gallagher Park is highly disturbed and previous environmental reporting has recorded contamination adjacent to the western boundary of the potential physical disturbance area boundary. The Alberta Soil Information Viewer lists the study area as disturbed lands of miscellaneous disturbed land soil series (AAF c2021). Soil investigations have found buried wastes, ash, and coal (AECOM 2017). Deeper contamination was found on the steeper hillsides adjacent to Connor's Road and was believed to be linked to significant surface disturbance. Other areas within Gallagher Park were found to have more surficial contamination, suggesting less disturbance. Metal exceedances located near the Muttart Conservatory, and PAHs, located near the old incinerator site, were the main parameters of concern within the soil of Gallagher Park (Spencer Environmental 2013; AECOM 2017). However, direct disturbance of the contaminated soils located west of the potential physical disturbance area is not anticipated.

Metal concentrations in soil samples taken within the project disturbance footprint were reported to be below guidelines (Shelby 2023). Trace PAH species were identified in samples within the Potential Physical Disturbance area. Within these samples the PAH levels recorded were below the guidelines applicable to the project, but exceed the more stringent Tier 1 guidelines for coarse grained soils. Remediation or onsite management is not expected to be of concern with the caveat that further sampling and management would be required if there are any plans for the export or reuse of the onsite soil.

The Twin City Coal mine lies within the project disturbance footprint (AER 2015). The Abandoned underground mine was operational between 1908 and 1921 with a depth of 81.7 m and thickness of 1.3 m (AER 2015). The upper coal seam workings of this mine may be located as shallow as 15 mbgs.

During the site assessment conducted October 4, 2023, soil characteristics were evaluated within the direct project footprint. In general, soils were found to be disturbed in nature, with small patches of more intact soil structure within treed areas. Topsoil depth was found to range from 25 cm to 30+ cm, with a topsoil texture of Loam.

TABLE 2. Soil Map Unit Descriptions

| AGRASID Polygon ID | | | | | | |
|---|------------|--|---------|--------------------------|-------------|----------|
| | | 13284 | | | | |
| Map Unit Name | | | | | | |
| | | ZDL1/DL | | | | |
| Landform | | | | | | |
| | | Disturbed Land (DL) | | | | |
| Landscape Model Description | | | | | | |
| | | Miscellaneous undifferentiated mineral soils (ZUN), may include soils that are not strongly contrasting from the dominant or co-dominant soils. Disturbed land (urban, open pit mines, gravel pits) (DL) | | | | |
| Parent Material | | | | | | |
| | | UO - Undifferentiated | | | | |
| Texture (topsoil) | | | | | | |
| | | Loam | | | | |
| Topography (percent slope) | | | | | | |
| | | 0% | | | | |
| Surface Stoniness | | | | | | |
| | | 0% | | | | |
| Drainage Class | | | | | | |
| | | Moderately Well | | | | |
| Horizon | Depth (cm) | Colour | Texture | Structure | Consistence | Comments |
| Site 101 – Treed Area in NE of Project Area | | | | | | |
| LFH | 1-0 | --- | --- | --- | --- | |
| Ah | 0-25 | 10 YR 3/2 | L | Fine granular | Loose | |
| Site 102 – Vegetated Fringe North of Current ESC Buildings | | | | | | |
| LFH | 1-0 | --- | --- | --- | --- | |
| Ah | 0-30+ | 10 YR 3/2 | L | Medium Subangular Blocky | Friable | |

4.5. VEGETATION

4.5.1. Vegetation and Wetland Communities

The vegetation study area was defined as the project footprint plus a 100 m assessment buffer. The study area is predominantly characterized by a large tract of maintained grass along the north facing slope, with occasional pockets of treed stands (Figure 3). Appendix A provides a summary of the plant species noted within each UPLVI vegetation community. Forested stands were dominated by aspen or a mix of trembling aspen (*Populus tremuloides*), balsam poplar (*Populus balsamifera*), and Manitoba maple (*Acer glauca*). These stands support a shrub understory of native and non-native species and native forbs.

The Maintained Grass (MG) vegetation community is predominantly comprised of a number of invasive non-native plant species including white clover (*Trifolium alba*), Kentucky bluegrass (*Poa pratensis*) smooth brome (*Bromus inermis*), quack grass (*Elymus repens*), tufted vetch (*Vicia cracca*), common dandelion (*Taraxacum officinale*), and common plantain (*Plantago major*). This area is routinely mowed and maintained for recreational usage.

The forested stand bordering 96th avenue was classified as a Mixed Deciduous Manitoba Maple (MD.3). The MD.3 community is dominated by a low density overstory of trembling aspen (*Populus tremuloides*), balsam poplar (*Populus balsamifera*), with an understory dominated by Manitoba maple (*Acer glauca*) with few native shrubs and herbaceous species. The shrub layer was dominated by Manitoba maple (*Acer glauca*) but also includes choke cherry (*Prunus virginiana*), high bush cranberry (*Viburnum opulus*), red-osier dogwood (*Cornus stolonifera*), burr oak (*Quercus macrocarpa*), and prickly rose (*Rosa acicularis*). The herbaceous layer (i.e., graminoids and forbs), represents a low percent cover comprising less than 2% cover, which includes agronomic grass species of smooth brome (*Bromus inermis*) and crested wheatgrass (*Agropyron cristatum*). A greater density of shrubs and herbs were observed at the treeline/ edges of the forested patches and included additional species such as noxious species woolly burdock (*Arctium tomentosum*), and various agronomic invasive species including common plantain (*Plantago major*), common dandelion (*Taraxacum officinale*), smooth brome (*Bromus inermis*), and alsike clover (*Trifolium hybridum*).

The forested patches on the slopes of Gallagher Hill were largely classified as Mixed Deciduous Mixed Shrubs (MD.1) communities. This community is dominated by balsam poplar and trembling aspen with a shrub layer of medial cover and moderate diversity. Manitoba Maple was also observed to occur in the understory of these stands. Shrub layer species included beaked hazelnut (*Corylus cornuta*), Manitoba maple, red-osier dogwood (*Cornus stolonifera*), prickly-rose (*Rosa acicularis*), and saskatoon (*Amelanchier alnifolia*). The forb layer observed was minimal within this community, comprised of smooth brome (*Bromus inermis*) and Kentucky bluegrass (*Poa pratensis*). Showy aster (*Eurybia conspicua*) and Canada thistle (*Cirsium arvense*) was also observed along the treeline of forested patches and a denser shrub layer was also observed at the treeline.

Two other vegetation communities were observed within the study area, Urban Residential and Road Infrastructure. Urban Residential was characterized by moderate density residential development, typically single-family dwellings with a small private landscaped yard. Roads, alleys, and paved sidewalks are present within this community type. The Road Infrastructure community represented Connors Road, located at the south boundary of the study area. Connors Road is a large multi-lane thoroughfare with concrete embankments and retaining walls to either side of the roadway. Wetland communities were not observed within the study area.

Within the study area, the most frequently occurring vegetation community was the Maintained Grass community, representing 55% of the study area, followed by the Urban Residential, representing 23% of the study area. The Mixed Deciduous Mixed Shrubs (MD.1) and Mixed Deciduous Manitoba Maple (MD.3) represent 9% and 5%, respectively. The Road Infrastructure community represents 2% of the study area. The project footprint directly interacts with only three vegetation communities, Maintained

Grass (MG), Mixed Deciduous Manitoba Maple (MD.3), and Disturbed. The majority of the project footprint lies within the Disturbed community, representing 53% of the project area. Maintained Grass (MG) and Mixed Deciduous Manitoba Maple (MD.3) represent 42% and 5%, respectively (Table 3, Figure 2).

TABLE 3. Summary of Vegetation Community Types in the Study Area

| Vegetation Community Type | Study Area (ha) | | Project Footprint | |
|---------------------------------------|-----------------|------------|-------------------|------------|
| | (ha) | (%) | (ha) | (%) |
| Upland Communities | | | | |
| Maintained Grass (MG) | 4.6 | 55 | 0.37 | 42 |
| Mixed Deciduous Manitoba Maple (MD.3) | 0.40 | 5 | 0.05 | 5 |
| Mixed Deciduous Mixed Shrubs (MD.1) | 0.69 | 9 | --- | --- |
| Urban Residential | 1.91 | 23 | --- | --- |
| Road Infrastructure | 0.14 | 2 | --- | --- |
| Disturbed | 0.49 | 6 | 0.49 | 53 |
| Wetland Communities | | | | |
| None observed | --- | --- | --- | ----- |
| Total Area and Percentage | 8.23 | 100 | 0.91 | 100 |

4.5.2. Species Diversity

The species diversity for the two vegetation community types overlapping the project area was evaluated, using the metrics of species richness (i.e., the number of species present) from both the 2020 vegetation assessments within the study area (Solstice 2021), and results of the October 4, 2023, assessment. The species richness within the MD.3 vegetation community was higher than within the MG vegetation community, with 23 and 16 species, respectively. It should be noted that within the MG community several of the species observed were landscaping species and did not represent a widespread occurrence.

4.5.3. Rare Plants

A search of the ACIMS database returned two results of listed species within 33-052-24-W4M, which were primarily to the north of the study area. These species included one invertebrate: creeping ancyloid (*Ferrissia rivularis*), and one plant: smooth sweet cicely (*Osmorhiza longistylis*). Creeping ancyloid was last observed in 2001 and smooth sweet cicely was last observed in 2013, and previously in 1946. None of the species listed within ACIMS were recorded within the potential physical disturbance area during the assessment carried out by Spencer Environmental Management Services Ltd. (Spencer Environmental) (2013). However, Spencer Environmental did record the smooth sweet cicely (*Osmorhiza longistylis*) within Henrietta Muir Edwards Park in 2013. Smooth sweet cicely prefers moist forests in Parkland and Grassland natural regions and may find suitable conditions within the forested stands within the Gallagher Park area. Populations of three S3 ranked rare species were also identified by Spencer Environmental (2013) within the aspen forest areas, including included tall anemone (*Anemone riparia*), yellow lady's slipper (*Cypripedium parviflorum*), and high-bush cranberry (*Viburnum opulus*). Species designated as S3 are generally known to occur in 21-100 locations in Alberta. Of these species, lady's slipper was documented as occurring in one of the larger aspen stands bordering the ski runs in Gallagher Park. The other species were found on the south side of Connor's Road, but could potentially be present in other

areas of the park (Spencer Environmental 2013).

Results from the rare plant survey completed by Solstice on July 18, 2019, for the Gallagher Park concept plan environmental overview documented the occurrence of three S3 ranked listed plant species, including tall anemone (*Anemone virginiana* var. *cylindroidea*), nodding stickseed (*Hackelia deflexa* var. *americana*), and smooth sweet cicely (*Osmorhiza longistylis*), as well as one S3S4 ranked plant species, high-bush cranberry (*Viburnum opulus*) (Solstice 2019).

Typical habitat for these rare species occurs within the study area, with all four rare species observed in Solstice (2019) occurring primarily within moist wooded areas:

- Tall anemone (*Anemone virginiana* var. *cylindroidea*) typically occurs in prairies and open woods,
- Nodding stickseed (*Hackelia deflexa* var. *americana*) within moist woods,
- Smooth sweet cicely (*Osmorhiza longistylis*) within moist woods, and
- High-bush cranberry (*Viburnum opulus*) within moist woods (Moss 1983).

A vegetation inventory was conducted during the October 4, 2023, survey. However, targeted rare plant surveys were not conducted, and the survey was conducted outside of recommended rare plant survey windows. One S3S4 ranked plant species, high-bush cranberry (*Viburnum opulus*) was noted within the RVOAC project footprint, located within the MD-3 vegetation community on the north edge of the project footprint. Species designated as S3S4 have uncertainty regarding the status and may fall within the S3 rank which have populations known to occur in 21-100 locations in Alberta or the S4 rank, which are populations that are uncommon, but not rare and apparently secure. However, this species is not tracked provincially. In the professional judgement of Solstice, high-bush cranberry is known to occur within the Edmonton region in greater abundance than 100 locations.

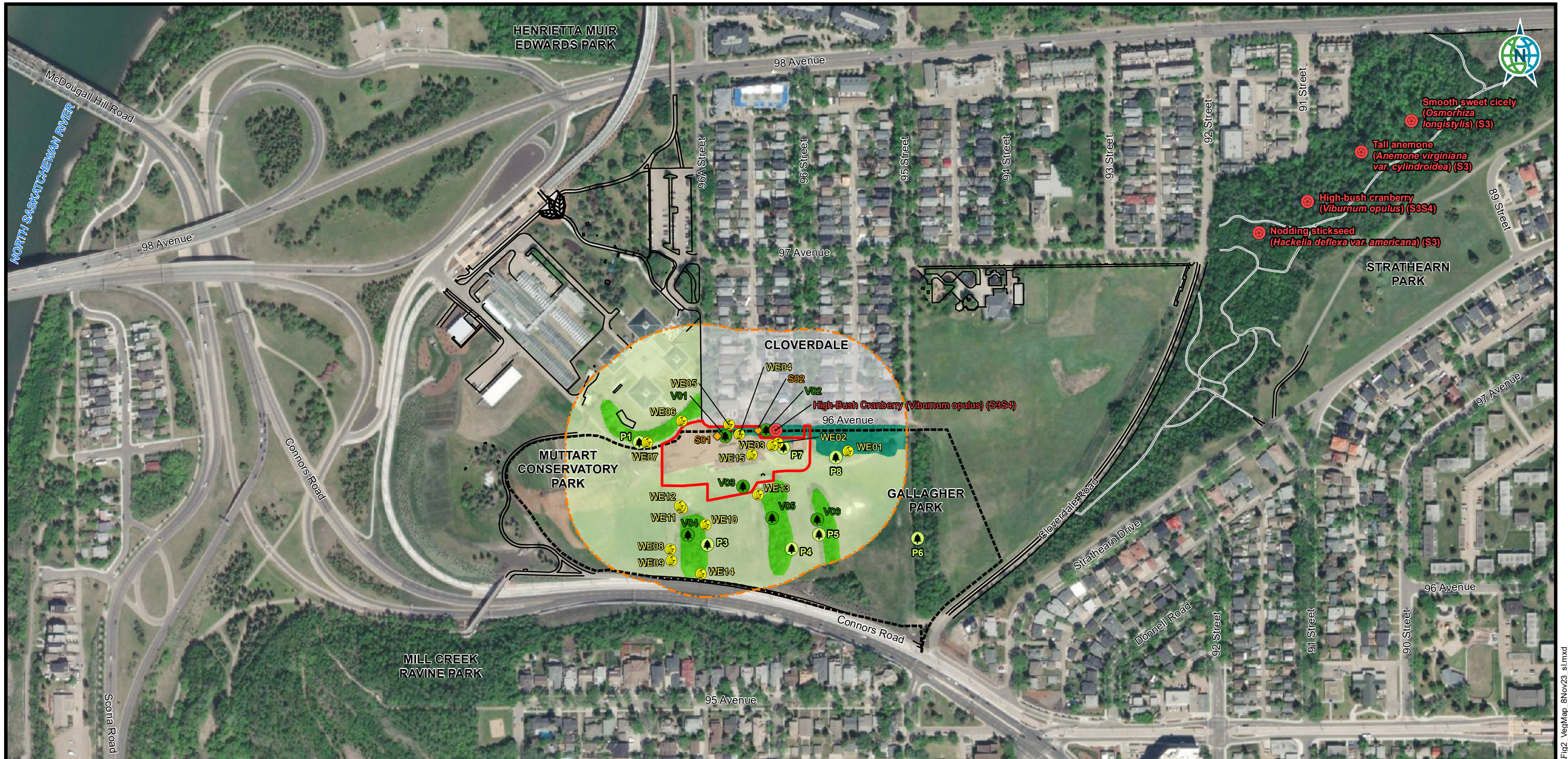
4.5.4. Weed Observations

On October 4th, 2023, four Noxious weed species, Canada thistle (*Cirsium arvense*), woolly burdock (*Arctium tomentosum*), common tansy (*Tanacetum vulgare*) and yellow toadflax (*Linaria vulgaris*) were observed within the RVOAC project footprint as well as in the surrounding area.

Kochia (*Bassia scoparia*) was also observed within the project footprint and occurring in a large dense patch at the top of Gallagher hill. This species is not currently listed under the *Weed Act*, however, there has been of increasing concern and documented resistance to glyphosate treatment. Details on observed weed populations are provided in Table 4, and locations of observed weed populations on Figure 2.

TABLE 4. Prohibited Noxious and Noxious Weed Populations

| Weed Assessment Point | Common Name | Scientific Name | Vegetation Community | Population Characterization |
|-----------------------|--------------------|----------------------------|----------------------|--|
| WD01 | Canada Thistle | <i>Cirsium arvense</i> | MD.3 | 5% cover |
| WD02 | Wooly Burdock | <i>Arctium tomentosum</i> | MD.3 | 10 x 10 m area at 70% cover |
| | Common Tansy | <i>Tanacetum vulgare</i> | | |
| WD03 | Canada Thistle | <i>Cirsium arvense</i> | MG | 40% cover |
| WE04 | Lily of the Valley | <i>Convallaria majalis</i> | MD.3 | 3 x 5 m patch of introduced species |
| WE05 | Canada Thistle | <i>Cirsium arvense</i> | MD.3 | 10 m ² area of 75% cover |
| WE06 | Canada Thistle | <i>Cirsium arvense</i> | MD.3 | 40% cover |
| WE07 | Yellow Toadflax | <i>Linaria vulgaris</i> | MD.3 | 5 x 5 m area at 40% cover |
| WE08 | Canada Thistle | <i>Cirsium arvense</i> | MG | 40% cover along east side of berm |
| WE09 | Wooly Burdock | <i>Arctium tomentosum</i> | MG | --- |
| WE10 | Canada Thistle | <i>Cirsium arvense</i> | MD.1 | 40% cover along the tree line |
| WE11 | Wooly Burdock | <i>Arctium tomentosum</i> | MD.1 | 10 m ² area at 35% cover |
| WE12 | Yellow Toadflax | <i>Linaria vulgaris</i> | MD.1 | 1 m ² area |
| WE13 | Canada Thistle | <i>Cirsium arvense</i> | MD.1 | 25% cover each |
| | Wooly Burdock | <i>Arctium tomentosum</i> | | |
| WE14 | Kochia | <i>Kochia scoparia</i> | MG | MG, 6 m ² area at 90% cover |
| WE15 | Yellow Toadflax | <i>Linaria vulgaris</i> | MG | --- |
| | Wooly Burdock | <i>Arctium tomentosum</i> | | |
| | Kochia | <i>Kochia scoparia</i> | | |



LEGEND

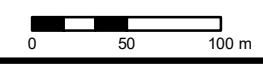
- | | | |
|--|---|--|
| <ul style="list-style-type: none"> Rare Plant Location 2020 Vegetation Assessment Point October 4, 2023 Vegetation Assessment Point Vegetation Weed Soil | <p>Vegetation Class</p> <ul style="list-style-type: none"> Maintained Grass (MG) Mixed Deciduous, Mixed Shrubs (MD.1) Mixed Deciduous, Manitoba Maple (MD.3) Disturbed Urban Residential Road Infrastructure | <p>Disturbed Class</p> <ul style="list-style-type: none"> Existing Paved Trails/Roads Existing Trails in Camel Humps Project Footprint EIA Study Area Boundary of Licensed Premises |
|--|---|--|

SOURCES:
 PROJECT FOOTPRINT APPROXIMATE FROM 2023-10-31 - 6013 - SITE PLAN.DWG, GEC ARCHITECTURE, OCT. 31, 2023.
 DISTURBANCE FEATURES FROM THE IBI 113178-X-BASE.DXF LS-SURF AND LS-SURF-NAT LAYERS.
 VEGETATION DATA FROM THE CITY OF EDMONTON PRIMARY LAND AND VEGETATION INVENTORY FOR URBAN ENVIRONMENTS (URBAN PLVI) DATASET (CITY OF EDMONTON 2015).
 ESRI, MAXAR, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRIID, IGN, AND THE GIS USER COMMUNITY.



**EDMONTON SKI CLUB EIA
 DOMINANT VEGETATION COMMUNITIES
 AND RARE PLANT LOCATIONS**

| | | |
|------------------------------|------------------------|-----------------|
| DATE: NOVEMBER 08, 2023 | PROJECTION: 3TM 114 | DATUM: NAD83 |
| PROJECT CODE: 22-13630-25 | FIGURE 2 | |
| SCALE: 1:4,000 | | |



4.6. WILDLIFE

Results of the FWMIS desktop search found past observations of short-eared owl within 1 km of the Study Area. Although no suitable breeding habitat for amphibian species was located within the Study Area, Canadian toad was noted within 1-km in the provincial FWMIS database. Red-sided garter snake and plains garter snake may also utilize the area, though no hibernacula were reported in the FWMIS database. FWMIS search results from a 3-km search radius are presented in Table 5.

Bird species noted during transect surveys conducted within or near Gallagher Park as part of the LRT environmental assessment (Spencer Environmental 2013) found only urban species, tolerant of human disturbance. Similar findings were noted by Solstice during the September 3, 2020 vegetation survey of the broader Gallagher Park area, where incidental wildlife species observations included black-capped chickadee (*Poecile atricapillus*), red squirrel (*Tamiasciurus hudsonicus*), American robin (*Turdus migratorius*), American crow (*Corvus brachyrhynchos*), pine siskin (*Spinus pinus*), hairy woodpecker (*Dryobates villosus*), and an unknown gull species.

During the October 4, 2023, site assessment of the project area returned similar results to historical survey results, primarily with observations of disturbance tolerant and urban species (Tables 6 and 7).

Wildlife species detected during the winter tracking surveys included deer (*Odocoileus* sp.), red squirrel, coyote (*Canis latrans*), black-billed magpie, black-capped chickadee, downy woodpecker (*Dryobates pubescens*), white-breasted nuthatch, pileated woodpecker (*Dryocopus pileatus*) as well as microtine rodents (mouse or vole, not determined to species).

TABLE 5. FWIMIS Wildlife Observations from a 3-km Search Radius

| Common Name | Scientific Name | Provincial Status | Wildlife Act Designation | COSEWIC Designation | SARA Designation | Preferred Habitat |
|-------------------------|---|-------------------|--------------------------|----------------------|------------------------------|--|
| Barred Owl | <i>Strix varia</i> | Sensitive | Special Concern | - | - | Mature coniferous and mixedwood forests, often in riparian areas |
| Boreal Toad | <i>Anaxyrus boreas</i> | Sensitive | - | Special Concern | Schedule 1 (Special Concern) | Usually near lakes, ponds, rivers, streams |
| Brown Creeper | <i>Certhia americana</i> | Sensitive | - | - | - | Mainly coniferous forests |
| Canadian Toad | <i>Bufo hemiophrys</i> | May Be at Risk | Data Deficient | Not at Risk | - | Springs, streams, marshes and other permanent water bodies, usually with abundant aquatic vegetation |
| Columbia Spotted Frog | <i>Rana luteiventris</i> | Sensitive | - | MP Candidate (SSC)** | - | Associated with mixed coniferous and subalpine forest areas with permanent water |
| Cougar | <i>Puma concolor</i> | Secure | - | - | - | Wooded and rocky places |
| Little Brown Bat | <i>Myotis lucifugus</i> | May Be at Risk | - | Endangered | Schedule 1 (Endangered) | Generalist near waterbodies |
| Northern Goshawk | <i>Accipiter gentilis atricapillus</i> | Sensitive | - | Not at Risk | - | Breeding: mature coniferous, deciduous, and mixed woodlands. Non-breeding: forest edges, parks, and farmland |
| Northern Leopard Frog | <i>Lithobates pipiens</i> | At Risk | Threatened | Special Concern | Schedule 1 (Special Concern) | Overwinter: cold, well oxygenated water bodies that do not freeze solid. Breeding: pools, ponds, marshes, lakes and occasionally streams. Summer: moist upland meadows and native prairie. |
| Northern Long-eared Bat | <i>Myotis septentrionalis</i> | May Be at Risk | Data Deficient | Endangered | Schedule 1 (Endangered) | Forested or shrubby areas near water |
| Peregrine Falcon | <i>Falco peregrinus anatum/tundrius</i> | At Risk | Threatened | Not at Risk | Schedule 1 (Special Concern) | Lake shores, river valleys, urban areas, alpine meadows, river mouths, and open fields. Migration: open areas |
| Plains Garter Snake | <i>Thamnophis radix</i> | Sensitive | - | MP Candidate (SSC)** | - | Generalist; frequents water |
| Red-sided Garter Snake | <i>Thamnophis sirtalis</i> | Sensitive | - | LP Candidate (SSC)* | - | Generalist; frequents water |
| Short-Eared Owl | <i>Asio flammeus</i> | May Be at Risk | - | Special Concern | Schedule 1 (Special Concern) | Open country, including grasslands, wet meadows and cleared forests |

*LP Candidate (SSC) – Low Priority Candidate for assessment by COSEWIC, recommended by Species Specialist Subcommittee (SSC)

**MP Candidate (SSC) – Moderate Priority Candidate for assessment by COSEWIC, recommended by Species Specialist Subcommittee (SSC)

TABLE 6. Wildlife Observations from Solstice Site Assessments

| Common Name | Scientific Name | Provincial Status | Wildlife Act Designation | COSEWIC Designation | SARA Designation |
|-------------------------|-------------------------------|-------------------|--------------------------|------------------------|------------------|
| American Crow | <i>Corvus brachyrhynchos</i> | Secure | --- | --- | --- |
| American Robin | <i>Turdus migratorius</i> | Secure | --- | --- | --- |
| Black-billed Magpie | <i>Pica hudsonia</i> | Secure | --- | --- | --- |
| Black-capped Chickadee | <i>Poecile atricapillus</i> | Secure | --- | --- | --- |
| Blue Jay | <i>Cyanocitta cristata</i> | Secure | --- | --- | --- |
| Coyote | <i>Canis latrans</i> | Secure | --- | --- | --- |
| Dark Eyed Junco | <i>Junco hyemalis</i> | Secure | --- | --- | --- |
| Deer species | <i>Odocoileus sp.</i> | Secure | --- | --- | --- |
| Downy woodpecker | <i>Dryobates pubescens</i> | Secure | --- | --- | --- |
| Hairy Woodpecker | <i>Dryobates villosus</i> | Secure | --- | --- | --- |
| Pileated Woodpecker | <i>Dryocopus pileatus</i> | Sensitive | --- | --- | --- |
| Pine Siskin | <i>Spinus pinus</i> | Secure | --- | --- | --- |
| Red Squirrel | <i>Sciurus vulgaris</i> | Secure | --- | --- | --- |
| White-breasted Nuthatch | <i>Sitta carolinensis</i> | Secure | --- | --- | --- |
| White-throated Sparrow | <i>Zonotrichia albicollis</i> | Secure | --- | Low Priority Candidate | --- |

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**MP Candidate (SSC) - Moderate Priority Candidate for assessment by COSEWIC, recommended by Species Specialist Subcommittee (SSC)

TABLE 7. Wildlife Feature Observations From 2023

| Feature ID | Feature Description | Mitigation |
|------------|---|--|
| W01 | Unoccupied cavity nest, approximately 2 cm diameter, located 2 m up a balsam poplar snag. | The occupation status of cavity nest features will need to be re-confirmed during a pre-construction wildlife sweep. |
| W02 | Pileated woodpecker forage tree (<i>Dryocopus pileatus</i>). | |
| W04 | Unoccupied cavity nest. Three approximately 1.5 cm diameter cavities 3m up a balsam poplar snag. | |
| W05 | Unoccupied cavity nest with an approximately 2 cm circular entry, located 3 m up a balsam poplar snag. | |
| W08 | Two unoccupied cavity nests with approximately 1.5 cm diameter entries, located 3 m up a balsam poplar snag. | |
| W10 | Unoccupied cavity nest with approximately 2 cm entry, located in a trembling aspen snag. | |
| W11 | Unoccupied cavity nest with an approximately 2.5 cm entry, located in a snag. | |
| W12 | Unoccupied cavity nest with an approximately 4 cm entry, located in a birch snag. | |
| W14 | Unoccupied cavity nest with an approximately 3.5 cm oval entry located at a height of 12 m in a balsam poplar snag. | |



LEGEND

October 4, 2023 Incidental Wildlife Observation Point

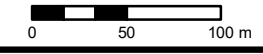
- Wildlife Observation
- Habitat Feature


Disturbed Class

- Existing Paved Trails/Roads
- Existing Trails in Camel Humps


- Project Footprint
- EIA Study Area
- Boundary of Licensed Premises

SOURCES:
 PROJECT FOOTPRINT APPROXIMATE FROM 2023-10-31 - 6013 - SITE PLAN.DWG, GEC ARCHITECTURE, OCT. 31, 2023.
 DISTURBANCE FEATURES FROM THE IBI 113178-X-BASE.DXF LS-SURF AND LS-SURF-NAT LAYERS.
 ESRI, MAXAR, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRIID, IGN, AND THE GIS USER COMMUNITY.





EST. 1911



**EDMONTON SKI CLUB EIA
WILDLIFE INCIDENTAL OBSERVATIONS**

| | | |
|------------------------------|------------------------|-----------------|
| DATE: NOVEMBER 08, 2023 | PROJECTION: 3TM 114 | DATUM: NAD83 |
| PROJECT CODE: 22-13630-25 | | |
| SCALE: 1:4,000 | | FIGURE 3 |



LEGEND

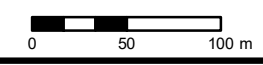
- Winter Survey Transect
- Existing Paved Trails/Roads
- Existing Trails in Camel Humps
- Project Footprint
- EIA Study Area
- Boundary of Licensed Premises

SOURCES:
 PROJECT FOOTPRINT APPROXIMATE FROM 2023-10-31 - 6013 - SITE PLAN.DWG, GEC ARCHITECTURE, OCT. 31, 2023.
 DISTURBANCE FEATURES FROM THE IBI 113178-X-BASE.DXF LS-SURF AND LS-SURF-NAT LAYERS.
 ESRI, MAXAR, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRIID, IGN, AND THE GIS USER COMMUNITY.



**EDMONTON SKI CLUB EIA
 WINTER TRACKING TRANSECTS**

| | | |
|------------------------------|------------------------|-----------------|
| DATE: JANUARY 29, 2024 | PROJECTION: 3TM 114 | DATUM: NAD83 |
| PROJECT CODE: 22-13630-25 | | FIGURE 4 |
| SCALE: 1:4,000 | | |



Z:\Edmonton Ski Club\22-13630-25_EIA\GIS\Projects\Figures\Fig4_WinterTracking_29Jan24_sl.mxd

4.6.1. Expected Species within the Study Area and Expected Habitat Usage

A list of expected wildlife species within the Study Area was compiled from desktop searches of publicly available information (e.g., FWMIS and eBird databases), and incidental wildlife observations from assessments conducted within Gallagher Park and the project area. The eBird database is a citizen science database where public can upload Species observations from the following eBird hotspots were compiled:

- Edmonton – Henrietta Muir Edwards Park – deciduous forest habitat along the NSR with frequent human usage along established pathways. Hot spot is about 450 m north of the study area.
- Edmonton – Gallagher Park, justification – hot spot is located within Gallagher Park and directly represents species observations within the study area.
- Edmonton – Mill Creek Ravine North – deciduous forest habitat along Mill Creek. Hot spot is located immediately south of the study area, and representing species using the adjacent Mill Creek habitat.

The project is located within the Central Parkland Natural Subregion (NSR 2006). A total of 613 species have the potential to occur within this Natural Subregion, including eight amphibians, 387 birds, 59 mammals, and three reptiles (Table 8). Of these species categories, six amphibians, 378 birds, 35 mammals, and two reptiles are known to occur within 100 km of the City of Edmonton (Table 8). However, not all these species have suitable habitat within the study area.

Within the project study area, the habitat as noted above in the vegetation communities (section 4.6.1) consists of a large tract of maintained grass along the slope with three mixed wood forest pockets along the ski slope and a narrow strip of forested area along the north project boundary. These forested stands were dominated by deciduous trees, with a diverse shrub layer which provides habitat for a number of wildlife species. The mix of both tree and shrub layer provides nesting sites for primary- and secondary-cavity nesting birds and an abundance of leaves that host insects which many species forage on. The native shrub layer, more specifically the choke cherry and high bush cranberry, provides an additional food source for avian and some mammal species. The presence of suitable habitat within the project area compared to wildlife species known to occur in the study area is presented in Appendix A.

The NSR is within 500 m of the project area, which provides a major wildlife corridor through the urban areas of the City. Many migratory songbirds may use this corridor as well as the red-sided garter snake which inhabits wet riparian areas. Species within the corridor may roam outside of these areas for foraging. Given the open grass area with the sections of mixed deciduous stands, the project area contains suitable habitat for both migrant and resident species preferring forest edges such as the clay-colored sparrow and the chipping sparrow. A number of species prefer habitat associated with urban forested areas and open fields, such as the rose-breasted grosbeak and pine siskin.

Several mammals are likely to frequent this mixed wood habitat such as white-tailed jackrabbit, red squirrel, porcupine, coyote and white-tailed deer, as many of these species have adapted to urban areas but still forage on aspen groves and mixedwood stands. Often species such as these may use the treed areas for cover and protection. The project area provides suitable habitat for mammal species who likely use the area year-round. Appendix A details resident wildlife species expected to use the project area, including pileated woodpecker, the white-breasted nuthatch, coyote, white-tailed deer, and porcupine.

TABLE 8. Summary of Expected Wildlife Species in the Parkland Natural Region and Within 100 km of the City of Edmonton

| Species Category | Total per Species Category | Migratory Status | | | | | | | |
|--|----------------------------|------------------|----------|---------------------|---------|--------------------|---------|--------|----------------------|
| | | Breeding | Resident | Breeding & Resident | Migrant | Breeding & Migrant | Vagrant | Winter | Distribution Unknown |
| Central Parkland | | | | | | | | | |
| Amphibians | 8 | --- | 7 | --- | --- | --- | --- | --- | 1 |
| Birds | 387 | 173 | 32 | 3 | 58 | --- | 100 | 8 | 13 |
| Mammals | 59 | 55 | 55 | --- | --- | | 3 | | --- |
| Reptiles | 3 | --- | 3 | --- | --- | | --- | | --- |
| Within 100 km of City of Edmonton | | | | | | | | | |
| Amphibians | 6 | --- | 6 | --- | --- | | --- | | --- |
| Birds | 378 | 143 | 28 | 2 | 64 | 2 | 127 | 10 | 2 |
| Mammals | 51 | 1 | 47 | | | | 3 | | |
| Reptiles | 2 | | 2 | | | | | | |

Notes: M- migrant- no evidence of breeding, only migrating through (denoted as small circle in Breeding Bird Atlas)

B- breeding- known or suspected to breed (denoted as large circle in Breeding Bird Atlas)

W- winter- not a resident, but may move to region in winter

R- resident- year round, breed and winter in region

V- vagrant- unusual occurrence, not part of normal range

?- Distribution in Subregion unknown

4.6.2. Wildlife Connectivity

Deer and coyote (medium to large-bodied mammals) were noted to periodically traverse Connor's Road from the Mill Creek Ravine area to Gallagher Park (Spencer Environmental 2013). Movement was potentially possible either throughout the park or in adjacent forested lands (Spencer Environmental 2013, Solstice 2017 and 2019).

Solstice's 2019 and 2021 connectivity analysis for the proposed Gallagher Park Concept Plan considered all vegetation in the City, in private yards as well as on public lands (Solstice 2019 and 2021). As with previous studies, this mapping found connective links in Gallagher Park through the wooded areas of the park (Spencer 2017). The previous 2017 Spencer Environmental assessment found increased resistance due to the inclusion of the Valley Line LRT which has been constructed south of the project area.

The results of the cumulative effects analysis on wildlife habitat connectivity for summer and winter coyote models are presented in Figures 5 and 6, and the black-capped chickadee model is presented in Figure 7. Strong connective links are still present throughout the wooded and maintained grass areas of Gallagher Park that surrounds the potential physical disturbance area.

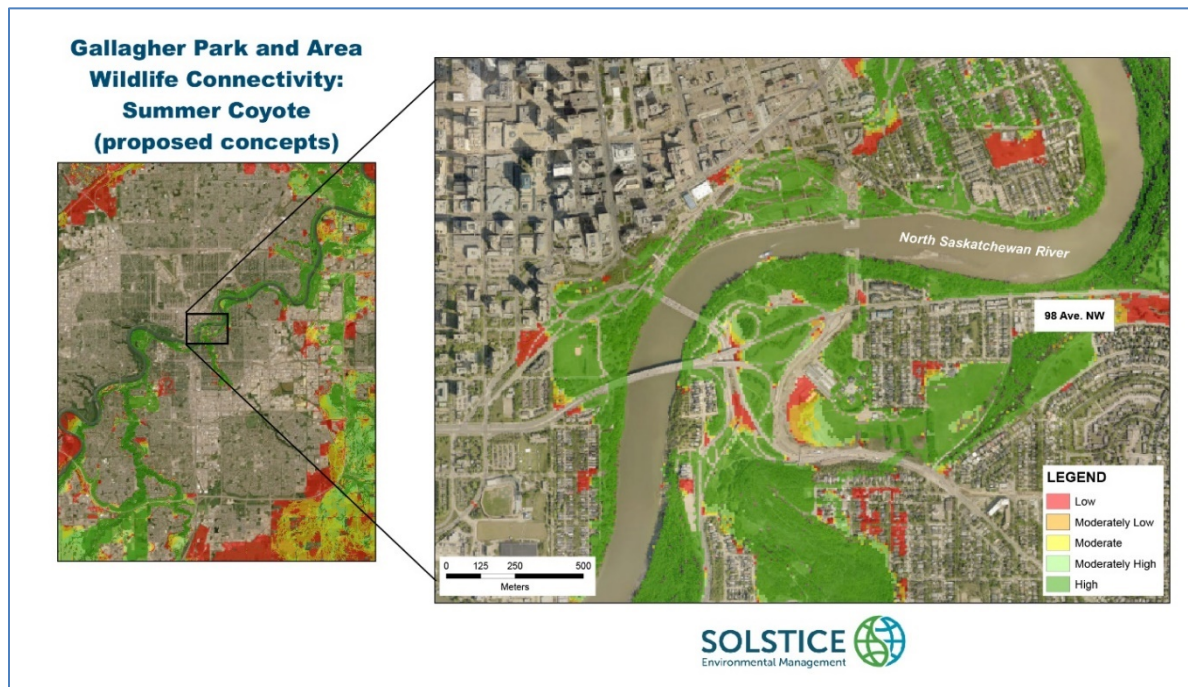


FIGURE 5. Coyote Habitat Connectivity in the Summer Considering the Proposed Concept of Gallagher Park and Area

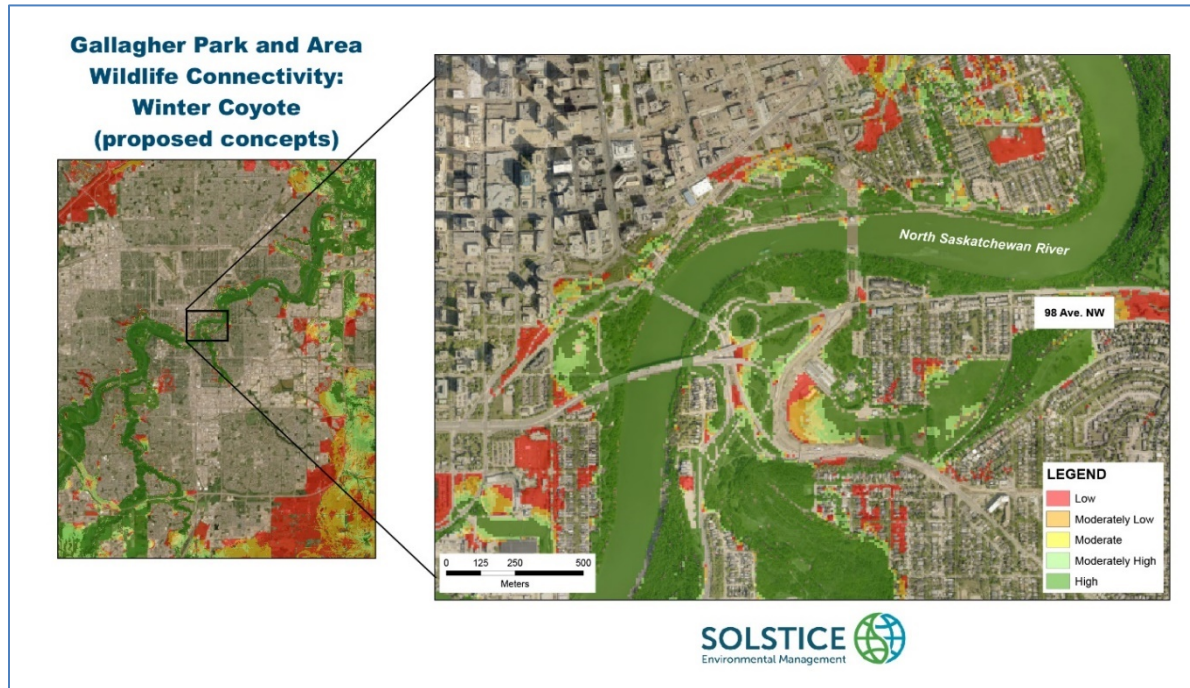


FIGURE 6. Coyote Habitat Connectivity in the Winter Considering the Proposed Concept of Gallagher Park and Area

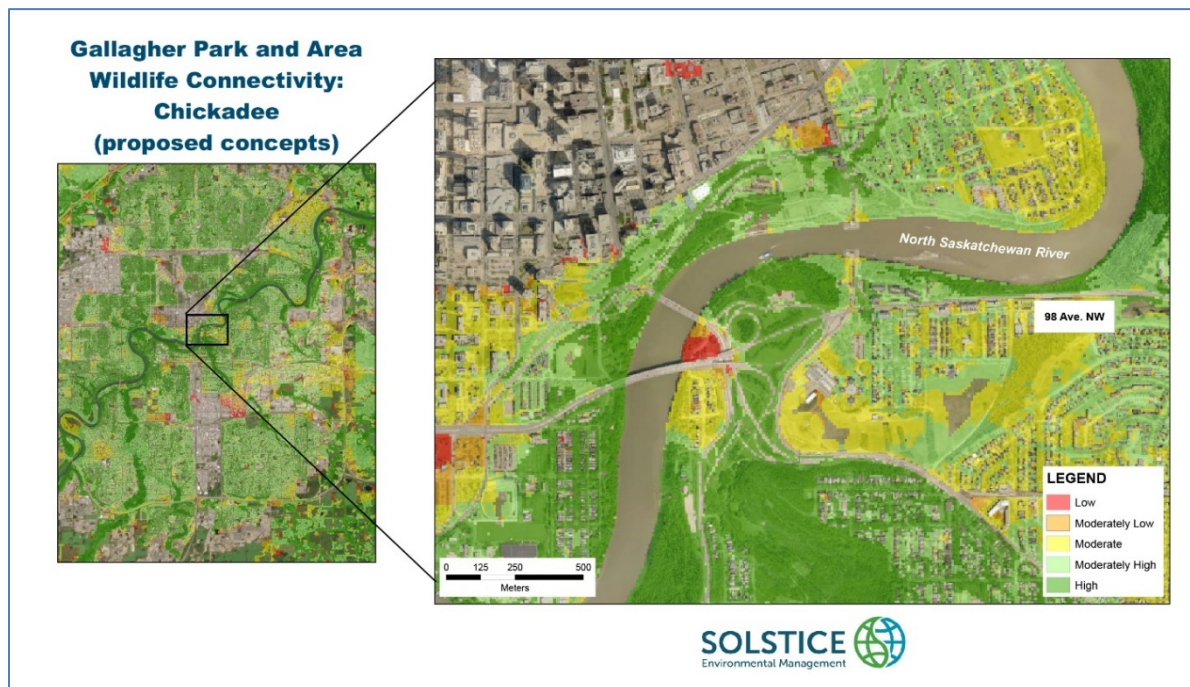


FIGURE 7. Black-Capped Chickadee Habitat Connectivity in the Summer Considering the Proposed Concept of Gallagher Park and Area

4.7. FISH HABITAT

Although the NSR lies 525 m north of the Potential Physical Disturbance area, it is possible for development activities to have indirect impacts on the aquatic habitat conditions of the river. As such, past studies conducted on this part of the river were included within this EIA.

As part of the Valley Line LRT Environmental Impact Screening report (Spencer Environmental 2013), a fish and fish habitat assessment was carried out by Pisces Environmental Consulting Services Ltd (Pisces). The study area encompassed a total of 2.5 km of the NSR, 2.0 km downstream and 0.5 km upstream of the Cloverdale Bridge. The area was found to have primarily moderate depth, with slow, run habitat, with areas of deep-water habitat and shallow shoals. Substrate within the channel varied from fine materials (low velocity areas) to coarse materials (high velocity areas). In-stream refuge consisted of boulders (from riprap) and varying water depths. Much of the instream study area was found to be less than two meters in depth, except in an area immediately upstream of the then existing bridge structure, where depths exceeded four meters. This section of the NSR was mostly Class C habitat under the *Water Act* Code of Practice, with a small area of Class A habitat (where water depth was greater). This latter small habitat area is considered highly sensitive.

The expanse of the NSR adjacent to Gallagher Park is classified as Class C habitat. Other adjacent fish habitat, such as Mill Creek (located 375 m north of the Potential Physical Disturbance area), is limited due to the redirection and isolation of the existing channel. The historic section of Mill Creek that connects to the NSR northwest of Gallagher Park may support fish species in times of high-water levels.

Fish species listed from a FWMISS search presented in Table 9.

TABLE 9. FWMISS Aquatic Observation Records from the North Saskatchewan River

| Common Name | Scientific Name | Provincial Status | Wildlife Act Designation | COSEWIC Designation | SARA Designation |
|--------------------|---------------------------------|-------------------|--------------------------|----------------------|------------------|
| Brook Stickleback | <i>Culaea inconstans</i> | Secure | - | - | - |
| Burbot | <i>Lota lota</i> | Secure | - | - | - |
| Emerald Shiner | <i>Notropis atherinoides</i> | Secure | - | - | - |
| Fathead Minnow | <i>Pimephales promelas</i> | Secure | - | - | - |
| Finescale Dace | <i>Chrosomus neogaeus</i> | Undetermined | - | - | - |
| Flathead Chub | <i>Platygobio gracilis</i> | Secure | - | - | - |
| Goldeye | <i>Hiodon alosoides</i> | Secure | - | - | - |
| Lake Sturgeon | <i>Acipenser fulvescens</i> | At Risk | Threatened | - | - |
| Longnose Dace | <i>Rhinichthys cataractae</i> | Secure | - | - | - |
| Longnose Sucker | <i>Catostomus catostomus</i> | Secure | - | - | - |
| Mooneye | <i>Hiodon tergisus</i> | Secure | - | - | - |
| Mountain Whitefish | <i>Prosopium williamsoni</i> | Secure | - | - | - |
| Northern Pike | <i>Esox lucius</i> | Secure | - | - | - |
| Quillback | <i>Carpionodes cyprinus</i> | Undetermined | - | LP Candidate (SSC)* | - |
| River Shiner | <i>Notropis blennioides</i> | Undetermined | - | LP Candidate (SSC)** | - |
| Sauger | <i>Sander canadensis</i> | Sensitive | - | - | - |
| Shorthead Redhorse | <i>Moxostoma macrolepidotum</i> | Secure | - | - | - |
| Silver Redhorse | <i>Moxostoma anisurum</i> | Undetermined | - | MP Candidate (SSC)* | - |
| Spoonhead Sculpin | <i>Cottus ricei</i> | May be At Risk | - | LP Candidate (SSC) | - |

| Common Name | Scientific Name | Provincial Status | Wildlife Act Designation | COSEWIC Designation | SARA Designation |
|-----------------|-------------------------------|-------------------|--------------------------|---------------------|------------------|
| Spottail Shiner | <i>Notropis hudsonius</i> | Secure | - | - | - |
| Sucker Species | <i>Catostomus Spp.</i> | | | | |
| Trout-perch | <i>Percopsis omiscomaycus</i> | Secure | - | - | - |
| Walleye | <i>Sander vitreus</i> | Secure | - | - | - |
| White sucker | <i>Catostomus commersonii</i> | Secure | - | - | - |

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4.8. HISTORIC RESOURCES

The study area falls within Legal Subdivisions 7 and 10, 33-52-24 W4M, which have been identified as locations that contain Historic Resource listings according to the most recent update (Spring 2023) as noted in Table 10 (Alberta Culture 2023).

TABLE 10. Historic Resource Listings by Legal Subdivision.

| Legal Subdivision | Resource Listing* |
|-------------------|-----------------------------------|
| 7-33-52-24 W4M | HRV 5 (a,p), HRV 1 (h), HRV 4 (p) |
| 10-33-52-24 W4M | HRV 5 (a,p) |

*HRV 1 designated under HRA as a Provincial Historic Resource, HRV 4 contains a historic resource that may require avoidance, HRV 5 has a high potential to contain a historic resource, 'a' is archaeological, 'h' is historic period, and 'p' is paleontological.

In Spencer Environmental (2013), overview assessments of the LRT study area indicated a Historical Impact Assessment was required only in the remnant Mill Creek gully, located near the river in Henrietta Muir Edwards Park and outside of the Gallagher Park Concept Plan area (Spencer Environmental 2013). Other areas were considered too disturbed by past activity. Paleontological work was also required along the slope south of Connor's Road, since the area was designated as HRV 5 (high value for paleontological resources).

Paleontological resources were anticipated within the Horseshoe Canyon bedrock layers. Historic Resources Impact Assessment work reported in Spencer Environmental (2013) did not indicate whether paleontological resources were discovered, but did highlight areas where potential was higher. The river terrace at the base of the ski hill area has alluvial deposits of 5-10 m thick, but near the top slope of the hill, surficial deposits are thin, and bedrock is within 0.5 to 2 m of surface. Dinosaur fossils have been found within Mill Creek ravine (Spencer Environmental 2013). Bedrock impacts are anticipated to occur as part of the Edmonton Ski Hill Club project. Building piles are anticipated to impact depths between 10-12 m. The installation of geothermal infrastructure is also anticipated to have impacts to bedrock at depths to 150 mbgs. Therefore, fossil resources have a high potential to be disturbed, in particular during the drilling of geothermal infrastructure.

An Historic Resources Screening was conducted for the project under a separate cover to determine if any further assessments and permitting are required to address potential impacts to Historical Resources. An Historic Resources Act Approval (HRA Number: 4725-23-0052-001, dated December 21, 2023) has been granted for the project (OPAC 2023).

5. PROJECT DESIGN

5.1. PROJECT DESIGN OVERVIEW

Project design drawings are provided in Appendix C.

The following preliminary project plan details were provided to Solstice for the preparation of this EIA:

- A building with a footprint of 10,000 sq. ft. , with a gross building area estimated to be approximately 17,500 sq. ft. The building is anticipated to be two stories, with an at-grade main floor and no basement. Building design is to incorporate piles at depths of 10-12 mbgs. The building will be heated, potentially incorporating geothermal technologies. The geothermal borefield is anticipated to incur subsurface impacts at depths up to 150 mbgs, and is to be tentatively located on the south side of the building.
- A 50,000 sq. ft. gravel parking lot. The parking lot is anticipated to have 88 parking stalls for the public and staff.
- A landscaping plan has not yet been developed but when completed will aim to incorporate low-impact water retention designs, and planting of native grasses and shrubs. Potential tree removal is anticipated as part of the project.

5.2. GENERAL PROJECT PHASING AND CONSIDERATION OF ENVIRONMENTAL SENSITIVITIES

A Concept Plan for the proposed ESC RVOAC facilities was not completed prior to this EIA; therefore the Community Led Business Case (City of Edmonton 2023a), and working designs were used to inform this assessment. Thus, project phasing is based on a general understanding of the associated activities that may be undertaken for each project component as indicated in Table 11. The Planned ESC RVOAC, were situated to avoid sensitive areas including an area of contaminated soil south of the Muttart Conservatory.

TABLE 11. Project Interaction Table

| Project Components | General Project Phasing and Associated Activities |
|--|--|
| New permanent paved shared use trails and sidewalks | <p>Site Preparation – vegetation clearing and/or removal of sod.</p> <p>Construction – minor soil excavation for pathway/sidewalk construction, cut and fill along portions of slope on the west side to create pathway grade and establishment of gravel base and paved top on all new permanent trails.</p> <p>Landscaping/Reclamation – re-sod and/or reseed disturbed areas adjacent to building footprint as per concept plan, preliminary and detailed design to be finalized during later project phases, and will take into consideration recommendations outlined in Section 6 of the EIA.</p> |
| New Permanent ESC River Valley Outdoor Activity Center | <p>Site Preparation – vegetation clearing and/or removal of sod and gravel pad at building site.</p> <p>Construction – building site and utility excavation, drilling of building piles, construction of geothermal bore field.</p> <p>Landscaping/Reclamation – re-sod and/or reseed disturbed areas adjacent to building footprint as per concept plan, preliminary and detailed design to be finalized during later project phases, and will take into consideration recommendations outlined in Section 6 of the EIA.</p> |
| Upgrades to road access from 98 Ave and construction of paved ESC parking area | <p>Site Preparation –removal of sod in areas where access road needs to be widened and extended, removal of gravel pad.</p> <p>Construction – soil excavation and construction of paved access road and parking area.</p> <p>Landscaping/Reclamation – re-sod and/or reseed disturbed areas adjacent to building footprint as per concept plan, preliminary and detailed design to be finalized during later project phases, and will take into consideration recommendations outlined in Section 6 of the EIA.</p> |

6. PROJECT IMPACTS AND MITIGATION MEASURES

6.1. ENVIRONMENTAL IMPACT ASSESSMENT METHODS

6.1.1. Impact Identification and Analysis

Based on our understanding of the project and the existing environmental context, the following VECs were selected for impact assessment:

- Surface Water,
- Groundwater,
- Soils and Geomorphology,
- Vegetation, and
- Wildlife.

Fish habitat was not carried forward to the impact assessment stage as the nearest watercourses with fish bearing habitat are greater than 375 m away and will not be directly impacted by any of the proposed works associated with the project. Any indirect effects (e.g., release of deleterious materials, including sediments) that could potentially affect fish or fish habitat area captured under the surface water component. Historical resources were also not carried forward to the impact assessment stage as proposed works associated with the project footprint generally involve disturbance to soil in areas that have already been historically disturbed and are outside areas that were identified as requiring a historical impact assessment. However, provisions for unanticipated discoveries have been included as part of the impact assessment process.

6.1.2. Impact Assessment Criteria and Evaluation

Potential direct and indirect impacts to selected VECs were identified by overlaying the potential physical disturbance impact on the mapped VECs and considered all project activities. Indirect impacts to selected VECs were assessed for the project outside the potential physical disturbance impact area at the following distances:

- Surface water at 500 m,
- Groundwater, Geomorphology, and Landform at 300m,
- Vegetation and Soil at 100 m,
- Wildlife at 3 km.

Construction works and structures are required for the project (e.g parking lot, pathways, site building, geothermal borefield) and were assessed for their potential interactions with the surrounding environment, based on existing environmental conditions. It is assumed that work will be completed in a manner that addresses safety and the environment, using current Best Management Practices (BMP) and will follow the requirements set out in the City of Edmonton's Environmental Management System (ENVISO), including the development of a site-specific Environmental Construction Operation (ECO) Plan.

Table 11 provides a summary of the assessment criteria for determining potential environmental impacts on each VEC. Potential environmental impacts were initially assessed without the application of additional mitigation measures. Any negative impacts that remained after additional recommended mitigation measures were applied were termed residual impacts.

TABLE 12. Assessment Criteria for Environmental Impact Assessment

| Criteria | Characteristics |
|--------------------------------------|---|
| Direction of Effect | |
| Negative (Adverse) | Loss to the resource. |
| Positive | Benefit to the resource. |
| Nature of Effect | |
| Direct | Direct loss/reduction of resource. |
| Indirect | Off-site impacts to adjacent resources outside of project area (i.e., sedimentation in adjacent watercourse or river). |
| Geographical Extent of Effect | |
| Local | Project footprint and adjacent land within the local study area. |
| Regional | Beyond the local study area boundary. |
| Magnitude of Effect | |
| Negligible | Slight change to the indicator, but in the range of natural variation. |
| Low | Impact will be noticeable, but recovery is possible within short-term. Or disturbance will permanently affect only a small portion of the resource relative to its availability (e.g., population, extent) or relative to regulatory standards (e.g., CCME guidelines). |
| Moderate | Impact will affect a moderate portion of the resource, beyond its capacity to recover (e.g., regional population, adjacent water sources). Or disturbance will permanently affect a moderate portion of the resource relative to its availability (e.g., local population) or relative to regulatory standards (e.g., CCME guidelines). |
| High | Impact will affect a large portion of the resource, beyond its capacity to recover. Or disturbance will permanently affect a significant portion of the resource relative to its availability (e.g., regional population) or relative to regulatory standards (e.g., CCME guidelines). |
| Duration and Frequency | |
| Temporary | Expected to return to baseline conditions within one year. |
| Seasonal | Expected to return to baseline conditions within one to two years. |
| Permanent | Never expected to return to baseline conditions naturally (irreversible effect). |
| Likelihood of Occurrence | |
| Likely | Impact has a high probability of occurring. |
| Unlikely | Impact has a low probability of occurring. |
| Unknown | Impact probability has a degree of uncertainty or requires further evaluation to determine. |

6.2. ASSESSMENT OF PROJECT ENVIRONMENTAL IMPACTS AND ASSOCIATED MITIGATION

6.2.1. Surface Water

6.2.1.1. Potential Impacts

Natural watercourses are not present within the study area, and both Mill Creek Ravine and the NSR are greater than 300 m from the project footprint. However, spills and releases, including sediments have potential to migrate or drain downslope into one of several catch basins that discharge into the storm system and eventually into the NSR, which is a fish bearing watercourse. Existing surface water management issues have been identified within the project area, which includes ponding at the base of the ski hill in spring and high rainfall events, as well as lack of stormwater management infrastructure within the adjacent neighborhood to convey surface water away from the site. Additionally, the project area is located 200 m from the 1:100 year flood level elevation of the NSR (AER 2015), Given the proximity to the flood risk zone, flood risk will need to be managed for the development. The project

design will incorporate upgrades to the existing surface water management within the project area, including bioswale installation to allow for surface water infiltration and decrease off-site drainage.

As such, potential impacts to surface water arising from project activities are limited to indirect effects on water quality from accidental release of sediments or deleterious substances into the storm sewer system. Should a release occur the potential environmental impact is expected to have a negligible, negative effect that is indirect, localized and temporary in duration.

6.2.1.2. Mitigation and Residual Impacts

Erosion and Sedimentation

Sediment releases due to erosion from facility construction activities, or from temporary storage of soils can be mitigated through temporary erosion and sedimentation control (ESC) measures. Revegetation and seeding/sodding of exposed soils should be implemented as soon as possible after project works are completed to minimize erosion risk. Temporary ESC measures, such as silt fences, straw wattle or geotextile fabrics will be required around areas of exposed soils to prevent erosion and sedimentation release. Temporary ESC measures should be installed in a manner that does not impede the movement of small animals (e.g., Canada geese, garter snakes and other herptiles and reptiles) by placing strategic openings. Where applicable, the use of biodegradable erosion control mesh and blanket is also preferable for allowing herptile and reptile movement onsite over plastic erosion control mesh or blanket. In addition, ESC measures such as catch basin inlet barriers should be placed around storm drains and catch basins along adjacent roadways to prevent sediments from entering catch basins. All ESC measures will be implemented in accordance with the City of Edmonton Erosion and Sedimentation Guidelines and associated Field Manual (City of Edmonton 2005a, b). With the implementation of such measures, residual impacts to surface water will be negligible.

Release of Deleterious Substances

Release of deleterious substances into the storm sewer system may occur as a result of spills or improper storage and handling of various materials. By implementing the following mitigation measures residual impacts will be reduced to a negligible effect:

- Implementation of a spill prevention and emergency response plan that complies with City of Edmonton and provincial spill reporting requirements.
- Secure storage of fuels, oils and lubricants, with appropriately sized spill kits in close proximity.
- Implementation of proper handling techniques including refueling and maintaining equipment in designated areas, a minimum of 100 m away from waterbodies or watercourses and not within a drainage path leading to a waterbody or watercourse.
- Preventive maintenance and regular inspection of all equipment to avoid accidental leaks.
- The use of vegetable-based hydraulic fluids for equipment working in or near water, to minimize the risk of harm should an accidental release occur.

Surface Water Runoff

Impervious surfaces (i.e., paved pathways) and gravel parking will result in potential surface runoff both on and offsite. Surface water runoff has the potential to accelerate erosional materials and deleterious substances reaching receptors. Without mitigations surface waters will have a more direct pathway to stormwater outlets and the NSR. To mitigate an increase in surface water from reaching receptors, natural vegetation buffers and/or bioswales are recommended to be incorporated into the final design plans. All storm water and surface water from the entire development property should be collected into a bioswale or naturalized vegetation buffer, where collected water is treated prior to discharge offsite to mitigate potential indirect impacts. With the implementation of such measures, residual impacts to surface water will be reduced to negligible.

6.2.2. Groundwater

6.2.2.1. Potential Impacts

The current stabilized groundwater within the potential physical disturbance area is estimated to occur at a depth of 8.85 mbgs, with a potential range between 10-12 mbgs based on the elevation of the NSR (Shelby Engineering 2023). Ground water seepage is reported to occur at 5.5 mbgs within the physical disturbance footprint area (Shelby Environmental 2023). Water table depths within the greater study area were noted to vary between 3.9 and 14.4 mbgs, with shallower groundwater depths located in the floodplain region adjacent to the NSR. Shelby (2023) identified that groundwater depths within the project area are approximately 8.0 m.

Based on the identified water table depths, it is anticipated that there is potential for direct or indirect impacts to groundwater associated with the construction of the ESC RVOAC, as project components require boring beyond depths of approximately 12 m in depth, in particular relating the geothermal infrastructure which may reach a depth up to 150 mbgs. There is potential that the boring of building piles and the construction of the proposed geothermal borefield could impact groundwater resources, though these impacts are expected to be low, direct, local and temporary when evaluating potential impacts to groundwater quantity. However, there is potential for negative impacts to water quality, as contamination is known to occur near the project area, as discussed in Section 2 and 4, as well as below under Soil and Landform (Section 6.2.2). Some uncertainty exists as to the likelihood of project interactions with potential contamination, however, interactions would be expected to be direct, local in extent, low magnitude, and temporary.

6.2.2.2. Mitigation and Residual Impacts

Potential impacts to groundwater resources will be mitigated through further assessment of groundwater regime within the project area. As recommended in the Phase 1 Environmental Site Assessment (ESA) for the project area (Solstice 2023a), further evaluation of soil and groundwater conditions and potential impacts related to the historic Cloverdale incinerator and landfill is recommended. The results of the Phase II ESA will be used to design appropriate groundwater mitigations relating to impacts to both groundwater quality, and quantity. Through the results of the 2023 geotechnical evaluation of the project area (Shelby 2023), soil samples were submitted for analysis and metals and polycyclic aromatic hydrocarbons (PAH) levels were within acceptable soil quality guidelines. Solstice (2023b) concluded that these parameters are not an area of concern, and as such the Phase II ESA is recommended to focus on PFA substances at the site. Additionally, Solstice (2023b) concluded that since the Shelby (2023) report demonstrated groundwater depths at 8.0 m within the project area, groundwater impacts are unlikely to cause impacts to surface receptors at site.

6.2.3. Soils and Geomorphology

6.2.3.1. Potential Impacts

Potential impacts to soils and landform associated with implementation of the proposed ESC RVOAC project. The project will primarily be constructed within the pre-existing disturbance area where the current ski club buildings exist. However, additional disturbance outside of this existing footprint is anticipated, including expansion of the building footprint, re-grading of the ski hill, installation of a gravel parking lot, bioswales, and geothermal infrastructure. The potential impacts from these potential disturbances to soil and geomorphology are detailed below.

Loss or Alteration to Soil Substrate

Some direct or indirect impacts to soils will occur as result of project works associated with the construction of site buildings and surfaces (e.g. paved pathways and gravel parking lots). Permanent soil disturbances will be limited to the specific locations where permanent features will be installed.

Temporary impacts to soil substrate may occur due to wind or water erosion of exposed soil, and through admixing of topsoil and subsoil during earthworks.

Site preparation and construction activities associated with the construction of site amenities and site grading and drainage upgrades will result in the removal of vegetation and exposure of bare soil surfaces, in small areas and possibly for extended periods of time. Construction activities on exposed soils can result in erosion and loss of topsoil and subsoil, degradation of topsoil quality, and weakened slope stability. In areas where existing vegetation cover is cleared, exposed soils are susceptible to water erosion in wet conditions and wind erosion in dry conditions. In this situation, sedimentation from eroded soils can accumulate downslope and potentially migrate off-site.

Soil compaction and rutting may also occur during site clearing and construction activities, especially if soils are wet. Compaction and rutting disrupt soil structure, impede root penetration, and reduce infiltration of water and nutrients. These disruptions to drainage patterns can affect vegetation growth and may prevent full revegetation and soil stabilization after construction. Degradation of topsoil quality by compaction, rutting, loss of organic matter, and admixing can be mitigated through proper soil handling and conservation practices.

If mitigation measures (e.g., BMP's, controls and clean-up measures) are not put into practice, the impact to soil substrate is anticipated to be negative, direct and indirect, of low magnitude, temporary, local and likely.

Disturbance of Known Historically Contaminated Soils

The ESC RVOAC has been sited to avoid impacting known areas of historically contaminated surficial soils, however, there is potential for project works to disturb contaminated soils. A Tier 2 Risk Assessment was completed the Muttart Conservatory and Gallagher Park (AECOM 2017), which has identified metal exceedances in the area immediately south of the Muttart Conservatory, and PAHs, located near the old incinerator site. Disruption of these contaminated soils could result in impacts to surrounding vegetation and surface water and groundwater receptors, if not managed appropriately.

Trace PAH species were identified in samples within the proposed project footprint (Shelby Engineering 2023). The 2023 Final Shelby Engineering geotechnical report notes that the PAH levels recorded in soil samples are below the guidelines applicable to the project but would exceed the more stringent Tier 1 guidelines for coarse grained soils.

The potential impact from project interactions with contaminated soils would be anticipated to be negative, direct and indirect, with a low to moderate magnitude, that is permanent, and localized in extent.

Contamination Due to Accidental Spills and Releases

Potential impacts to soil from contamination can occur through refueling spills, poor storage and handling of materials, equipment repairs, and leaks due to insufficient equipment maintenance. Typical contaminants include oil, fuel, lubricants, and other hazardous substances used in conjunction with construction activities. Release of these contaminants to surrounding soils can have various negative on- and off-site impacts to the environment and human health. Incidents would typically be small in scale, but could become more serious if not quickly controlled. Potential impacts from hazardous or deleterious substance spill would be negative, direct, negligible to low, temporary, and local. The likelihood of these interactions is unknown.

Slope Stability

All project works are anticipated to be off-set from any major slope-breaks. As such potential impacts to slope stability would be unlikely, but would be negative, negligible to low, direct, local and a temporary impact.

6.2.3.2. Mitigation and Residual Impacts

Loss or Alteration to Soil Substrate

Any loss or alteration to soil substrate associated with soil erosion and sedimentation, admixing or compaction will be mitigated through the following measures:

- Temporary erosion and sedimentation controls (ESCs) should be designed, implemented, and maintained until the site is sufficiently reclaimed and the soils stabilized. These can include such measures as silt fences, straw wattle or geotextile fabrics around areas of exposed soils and catch basin inlet barriers around storm drains and catch basins along adjacent roadways.
- All ESC measures will be implemented in accordance with the City of Edmonton Erosion and Sedimentation Guidelines and associated Field Manual (City of Edmonton 2005a, b) and will include a plan that specifies monitoring protocols, including frequency of monitoring.
- Revegetation and seeding/sodding exposed soils as soon as possible after project works are completed to minimize erosion risk.
- Minimize or avoid construction activities during wet periods (e.g., during spring thaw and during periods of heavy rain) to reduce compaction and rutting of soils.
- Minimize usage of heavy equipment and vehicles within the river valley environment.
- If soil salvage and storage is required, the salvage and storage of topsoil and subsoils soils should be separated to reduce the likelihood of admixing.

Provided that best management practices and appropriate mitigation measures are implemented and maintained, the residual impacts of loss or alteration to soil substrate from soil erosion and sedimentation, admixing or compaction will be reduced to negligible.

Disturbance of Known Historically Contaminated Soils

Should the implementation of the preferred project design require construction adjacent to or directly within known historically contaminated surficial soils, where there is a risk of soil disturbance, a site-specific risk management plan will be developed. Based on the recommendations from the Tier 2 Risk Assessment completed by AECOM (2017) the risk management plan should at a minimum address the following:

- Capping contaminated areas with an impermeable clay layer and avoiding future ground disturbance to minimize risk of human exposure by establishing landscaping and park maintenance measures that maintain the integrity of the cap.
- Soil management plans and protocols, including handling and disposal of contaminated soils, as well as any required monitoring and site controls to reduce the risk for off-site migration of contaminated soils and any risks to worker health and safety.
- Recommendations for additional groundwater monitoring points between the plume and the NSR and for future groundwater monitoring requirements.
- Implementing management and control measures restricting the use and access to groundwater resources.

Similar to mitigations recommended for potential groundwater impacts detailed in Section 6.2.2.1, potential impacts to soil resources will be mitigated through further assessment of potential soil contamination within the project area. As recommended in the Phase 1 Environmental Site Assessment (ESA) and addendum for the project area (Solstice 2023a, Solstice 2023b), the Phase II ESA should focus on evaluation of potential PFA substances at the site. The results of the Phase II ESA will be used to design appropriate soil mitigations relating to impacts relating to interactions with potential soil contamination.

Remediation or onsite management is not expected to be of concern with the caveat that further sampling and management would be required if there are any plans for the export or reuse of the onsite soil, and

should therefore be avoided. If the export or reuse of soils offsite is desired, soil should be tested for potential contaminants prior to use.

Potential residual impacts from potential project interactions with known historical contamination are expected to be negligible following the above mitigations.

Contamination due to Accidental Spills and Releases

Implementation of BMPs to minimize and avoid the risk of soil contamination due to accidental spills and releases are a key measure in reducing contamination risks and include designating areas for refueling and storing of oil and other lubricants that are away from water and protected against spills (i.e., use of double-walled fuel tanks or stored in areas with spill containment). It is anticipated that the Proponent will be required to provide a spill prevention and emergency response plan, and a hazardous waste management plan as part of the site-specific ECO Plan to meet the City of Edmonton's ENVISO requirements. Those plans will include specific measures related to securely protecting all roadway catch basins in the project area and will outline monitoring protocols and frequency.

With these measures in place the residual impact of spills should be negligible. Small spills may still occur as a result of equipment malfunctions, but they would be containable and thoroughly cleaned up with no residual impact.

Slope Stability

The risk to slope stability during and post-construction can be reduced to a negligible residual effect through the implementation of the following measures:

- Cut-and-fill areas created during clearing and construction should be contoured to incorporate stable side-slopes to reduce erosion potential and instability.
- If it is determined that there is a risk to slope stability from any project component, appropriate stabilization measures will be developed and implemented using methods acceptable to the City of Edmonton.

6.2.4. Vegetation

Vegetation clearing is anticipated to occur as a result of project activities. This includes the removal of existing areas of manicured grass, removal of some existing landscaping surrounding the existing buildings prior to demolition, and removal of areas of mixedwood forest along the north side of the project area to facilitate the construction of bioswales. The potential impacts to vegetation associated with implementation of the proposed ESC RVOAC are detailed below.

6.2.4.1. Potential Impacts

Loss or Alteration of Native Plant Communities and Rare Plants

Although the project siting minimizes impacts to native plant communities, some direct loss of vegetation, both permanent and temporary will occur as result of project works associated with the construction of site buildings and permanent structures (e.g., paved pathways, gravel parking lot, and geothermal borefield, bioswale construction) as indicated in Figure 3 and Appendix C.

The project footprint directly interacts with three vegetation communities, Maintained Grass (MG), Mixed Deciduous Manitoba Maple (MD.3), and Disturbed. The majority of the project footprint lies within the Maintained Grass (MG) community, representing 42% of the project footprint, while the Mixed Deciduous Manitoba Maple (MD.3) represents 5% (Table 2, Figure 2). About 0.37 ha of the MG community will have direct impacts from the project, and within the project footprint this community is largely comprised of pre-existing development interspersed with manicured grass (e.g., existing ESC buildings, and gravel parking lot). About 0.05 ha of the MD.3 vegetation community will be directly impacted, which will include removal of existing mature vegetation within this area.

The clearing within the MD.3 community will result in the temporary loss of this mature tree stand. This loss is considered temporary as the landscaping plan includes the planting of large caliper trees, and understory species. This stand of trees has been assessed by the City of Edmonton Natural Areas Coordinator and was determined to be unsustainable as the stand is primarily comprised of non-native species and not in good health (Courtney Teliske Pers.Com.).

Thus, the potential impact associated with permanent loss of native plant communities is expected to have a low, negative effect that is permanent, localized, and likely to occur. However, any potential negative impacts can be offset by the establishment of naturalized plantings, which will result in a net increase in native vegetation within the project footprint. Naturalized planting plans are anticipated to be developed during later project phases. As a result, the overall impact of the project will result in a direct, positive effect to vegetation that is low to moderate in magnitude, local, and permanent.

Direct impacts to one rare plant species are expected as a result of the project. High-bush cranberry (*Viburnum opulus*), a provincially ranked S3S4 tracked species, was observed within the MD.3 vegetation community which is anticipated to be removed for the construction of the bioswales. Additional populations of this species were also observed previously occur along the slopes in the northeast portion of Strathearn Park in the Camel Humps area just east of Cloverdale Hill and 91 Street and also in one of the larger aspen stands bordering the ski runs in Gallagher Park. Species designated as S3S4 have uncertainty regarding the status and may fall within the S3 rank which have populations known to occur in 21-100 locations in Alberta or the S4 rank, which are populations that are uncommon, but not rare and apparently secure. However, this species is not tracked provincially. In the professional judgement of Solstice, high-bush cranberry is known to occur within the Edmonton region in greater abundance than 100 locations.

Introduction and Establishment of Invasive Weed Species

Four noxious weed species, Canada thistle (*Cirsium arvense*), woolly burdock (*Arctium tomentosum*), common tansy (*Tanacetum vulgare*), and yellow toadflax (*Linaria vulgaris*), were observed with low abundance in the study area. Prohibited noxious weeds were not identified. In addition to noxious weeds, populations of non-regulated invasive plant species, such as smooth brome, tufted vetch and quack grass were present throughout the study area. Given that the study area is primarily comprised of Maintained Grass within an urban environment, there is the potential that other noxious and prohibited noxious weeds from surrounding urban areas can spread and become established in disturbed areas. Disturbance and exposure of soil during site clearing and construction phases of the project have the potential to create ideal conditions for the establishment of populations of various noxious and prohibited noxious weeds commonly found in Edmonton. Preventing the ingress and establishment of weed species is the most cost-effective approach to weed management. Without appropriate mitigation in place, the establishment and spread of invasive or weedy species within revegetated and reclaimed areas is expected, and the impact will be negative, direct, low to moderate magnitude, local and likely.

Planned Tree Removals and Accidental Tree Damage

Impacts to existing trees within the project area will occur as planned activity, or as accidental impacts during site works. Removal of existing trees is planned to facilitate the installation of a bioswale required for surface water management. Trees, as well as understory species, within the Mixed Deciduous Manitoba Maple (MD.3) vegetation community will be removed to allow for bioswale installation. Tree and understory planting will be undertaken within the bioswale post-construction.

Clearing of vegetation will be required, including removal of sod within the Maintained Grass portions of the study area that contain planted vegetation, including trees. Though construction activities will be situated to avoid direct impacts to planted vegetation, there is potential for adjacent trees to be exposed to limb, trunk or root damage as a result of indirect activities.

The potential for planned tree removals is rated as a negative, direct, low magnitude, permanent, local

and a likely impact. The potential for additional incidental tree damage or loss is rated as a negative, direct, low, temporary to permanent, local and likely impact.

6.2.4.2. Mitigation and Residual Impacts

Loss or Alteration of Native Vegetation Communities and Rare Plants

Any permanent and temporary loss of native vegetation communities will be mitigated through the following measures:

- Any areas within the Maintained Grass vegetation type that requires removal of sod associated with temporary working areas will be reclaimed and re-sodded or reseeded to meet City of Edmonton specifications.
- All project works will be developed and implemented to ensure compliance with the City of Edmonton Corporate Tree Management Policy and will comply with specific tree removal and protection specifications.
- Any permanent loss of native vegetation associated with the loss of the western part of the treed stand just south of 96 Avenue and east of the proposed ESC building will be directly addressed through the establishment of new treed areas within the project footprint.
- Establishment of new naturalized planting areas will be implemented incorporating native plant species. This will result in a net gain in native vegetation cover and will enhance the overall biodiversity and connectivity of Gallagher Park.
- Detailed naturalization or reclamation plans will be developed as part of the detailed design phase by a qualified professional. These plans will include more detailed information on plan objectives and requirements, plant species selection and specifications, and planting bed design. All plans will be developed in consultation with project stakeholders, including City of Edmonton representatives. Landscaping plans are provided in Appendix C.
- Where feasible, include new landscaping areas to enhance habitat within the project area.
- All naturalization or reclamation plans are to be reviewed by the City of Edmonton, or a City of Edmonton representative.
- Populations of high-bush cranberry (*Viburnum opulus*), a provincially ranked S3S4 vegetation species, should be documented prior to vegetation removals, and avoided where feasible.
- A supplemental rare plant survey will be completed prior to vegetation clearing. The project team will adopt applicable mitigation strategies to avoid potential impacts to the rare plant species and proper restoration if applicable.

With the implementation of the above measures, it is expected that loss of native vegetation communities will be fully mitigated over time, as there will be a net positive gain in woody, naturally vegetated areas. Thus, with successful revegetation and reclamation, the anticipated residual impact of loss or alteration of native vegetation communities and rare plants is expected to be negligible.

Introduction and Establishment of Weed Species

The risk of weed establishment during and post-construction will be reduced through the following measures:

- Cleaning of all equipment before entering the construction area. All equipment will arrive on-site in a clean condition
- Prompt re-sodding or reseeded of all areas of exposed soils in the Maintained Grass vegetation type following reclamation of temporary site disturbance associated with construction.
- Implementation of weed management plan, including weed control measures for any identified noxious or prohibited noxious weed, which will be outlined in the site-specific project ECO plan. Prompt weed control and diligent weed monitoring will be required, including construction and reclamation/revegetation.

- Limit soil disturbances, including any soil stockpiles, as much as practical.

It is anticipated that there will be a need for the City of Edmonton to undertake weed control in the years following construction of project components. Assuming diligent implementation of these mitigation measures, the residual impact related to the introduction and establishment of weed species will be reduced to negligible.

Planned Tree Removals and Incidental Tree Damage

Incidental tree damage can be minimized through implementing the following measures:

- A Tree Preservation Plan will be prepared and implemented prior to construction. The Tree Preservation Plan which will include measures to physically protect native treed stands and planted trees that are present in areas where proposed project components such as shared use pathways and viewpoints will be established.
- As detailed within the Tree Preservation Plan, compensation will be paid to the City of Edmonton, which will correspond with the value of trees to be removed.
- Any soil damage or compaction compromising the root system of trees within the parkland space will be corrected.
- Large caliper landscaping trees will be planted within the bioswale areas post-construction.
- Tree preservation efficacy will be monitored throughout the period of construction and any incidental damage will be documented and reported to the City of Edmonton.

With the implementation of these mitigation measures, the residual impact associated with potential for incidental tree damage will be reduced to negligible. For trees with planned removals, the impacts will be reduced to low magnitude. The restoration plan this area focuses on planting tree species which will be tolerant of the hydrological conditions within the bioswales, while providing equivalent ecosystem services as the baseline mixedwood forest present.

6.2.5. Wildlife

6.2.5.1. Potential Impacts

Impacts to wildlife are anticipated to occur as a result of project activities. Impacts are anticipated to primarily be related to impacts to wildlife habitat during construction, as well as the increased activity in the project area during construction. The potential impacts to wildlife associated with implementation of the proposed ESC RVOAC are detailed below.

Direct and Indirect Impacts to Wildlife Habitat

Direct impacts to wildlife habitat from vegetation clearing has the potential to result in the loss of wildlife habitat. It is expected that the majority of works associated with the ESC RVOAC will be completed in the existing unvegetated gravel area and Maintained Grass vegetation type, which has little to no wildlife habitat value for most wildlife species that utilize the study area. Minimal clearing of native vegetation will be required and will be limited to the stand of trees just south of 96 Avenue and north of the proposed ESC building. Although many other areas of mature forest existing within Gallagher Park, the strip of mature mixedwood forest (MD.3) is considered moderate to high value habitat in relation to wildlife connectivity within the study area (Section 4.6.2). Disturbances to this habitat are considered short-term, as the landscaping plan includes planting of large caliper trees and understory species within the bioswale areas, which will restore the structure and function of this mature trees area post-reclamation. It should be noted that project designs were adapted to retain the treed strip in the northeast of the project area, which will serve to maintain some of the baseline connectivity during construction and reclamation. As such, direct loss of wildlife habitat will be minimal and is characterized as a negative, negligible, temporary, local, and likely effect. However, wildlife habitat will ultimately be enhanced through establishment of new naturalized areas, which will result in a net positive gain of wildlife habitat in the long-term.

In addition to direct loss of wildlife habitat, indirect impacts to wildlife habitat from construction activities and increased use of the Gallagher Park may affect wildlife use of the area and reduce habitat effectiveness of the surrounding native vegetation. It is anticipated that wildlife habitat effectiveness may be disrupted during construction periods due to increased noise and activity on site. This impact is expected to be negative, direct, negligible to low, temporary, local in scale, and likely to occur. As the overall use of Gallagher Park does not change from baseline conditions with the construction of the new ESC RVOAC, impacts to wildlife use or reduced habitat effectiveness from increased human use are expected to be negligible. Most wildlife species that frequent the Gallagher Park area are adapted to some level of human disturbance and none of the project components are significant enough to act as a barrier to wildlife movement. All temporary ESC measures will need to be installed in a manner that does not impede the movement of small animals (e.g., Canada geese, garter snakes) by placing strategic openings. Where applicable, the use of biodegradable erosion control mesh and blanket is also preferable for allowing herptile and reptile movement onsite over plastic erosion control mesh or blanket.

Overall, direct and indirect impacts to wildlife habitat, taking into consideration proposed naturalization activities, will result in a direct, net positive effect that is low to moderate in magnitude, local and regional in area, and permanent.

Mortality or Disturbance to Protected Wildlife and Migratory Breeding Birds

Mortality or disturbance to migratory breeding birds is prohibited under the *Migratory Birds Convention Act* and the *Alberta Wildlife Act*. The *Alberta Wildlife Act* also prohibits disturbing and causing mortality to other wildlife species found in Alberta. Direct impacts to breeding birds may occur if bird species are nesting in or adjacent to areas require vegetation clearing or within the proposed project work area during the spring and summer breeding season. This applies to all vegetated areas including native treed stands, ornamental and planted trees and maintained grass, as many migratory songbirds use these areas for nesting, breeding or foraging habitat. Mortality may occur directly (i.e., birds killed through the construction process) or from nest failure or abandonment. Adults, fledglings, and eggs may be at risk if they are unwilling or unable to leave the nest. Current best management practices outlined by Environment Canada recommends avoiding vegetation clearing during the period when there is a high probability of nesting activity, which for the Edmonton area is between April 15th and August 31st (GoC c2018). In the absence of the adherence to this standard or implementation of additional mitigation measures the potential for nest disturbance is high.

Additionally, early season nesting owls that occur in Edmonton are protected under the *Wildlife Act*. As such, vegetation clearing of mature trees during the owl nesting season from February 15th to April 20th should be avoided to minimize any potential impacts or mortality to breeding owls. Northern flying squirrels are another species that is protected under the *Wildlife Act* that has the potential to be present in the study area. As northern flying squirrel nest in tree cavities, activities associated with vegetation clearing and/or other construction have the potential to result in the direct mortality or disturbance of breeding habitat of this species.

While pileated woodpecker nests or roosting cavities have not been observed in the project footprint to date, pileated woodpecker foraging activity was observed within the Study Area. The nesting cavities of pileated woodpecker are protected year-round, including when they are not occupied by a migratory bird or viable eggs. If the proponent wishes to destroy an unoccupied nest of a species listed on Schedule 1 of the federal Species at Risk Act, they must submit a notification through the Abandoned Nest Registry. If the nest remains unoccupied by pileated woodpecker and other migratory bird species for 36 months, it may at that point be destroyed by cutting down the tree (GoC 2022). A pre-construction wildlife sweep will be required to confirm the presence of any new wildlife features and confirm the occupancy status of previously identified features prior to construction activities. Disturbance or mortality to wildlife and migratory birds may occur as a result of design features of the project, primarily related to increased glass surfaces which may cause increased bird strikes, and changes to site lighting that may increase sensory disturbance to wildlife species.

In the absence of adherence to vegetation clearing best management practices, impacts resulting in the mortality or disturbance of migratory bird species or other wildlife species are expected to have a direct, negative, low to moderate, seasonal effect that is local and likely to occur.

6.2.5.2. Mitigation and Residual Impacts

Direct and Indirect Impacts to Wildlife Habitat and Connectivity

Negative residual impacts are not anticipated for wildlife habitat as wildlife habitat will ultimately be enhanced through establishment of new naturalized areas, which will result in a net positive gain of wildlife habitat.

Indirect impacts to wildlife habitat use and connectivity can be reduced through implementation of the following mitigation measures:

- Although unlikely to occur, night shift work (if required) will be minimized to allow wildlife passage through work areas. If night shift work is required, lighting used will be isolated to the immediate work site to limit light pollution and sensory disturbance into the surrounding habitat.
- Whenever possible, limit work activities during the evening and early morning hours.
- Storage of materials and equipment will be situated in previously disturbed or hardscaped areas (e.g., parking lots) wherever possible to avoid unnecessary disturbance or restriction of wildlife movement.
- Conduct reclamation of areas with vegetation removal in a timely manner. Plant large caliper trees in areas where tree removal is required (i.e., bioswale) locations to expedite the successional trajectory to equivalent habitat structure as baseline conditions.
- Include new areas of landscaping where possible to enhance existing habitat within the project area. Include pollinator species within landscaping plans.

With the implementation of these mitigation measures, the residual impact associated with indirect impacts to wildlife habitat use and connectivity will be reduced to negligible.

Mortality or Disturbance to Protected Wildlife and Migratory Breeding Birds

In areas where vegetation and tree clearing are required, the recommended Environment Canada guidelines for reducing impacts to migratory birds, and the *Migratory Birds Convention Act*, will be followed as outlined below:

- All tree and brush clearing activities will avoid the estimated high-risk period for migratory bird breeding season between April 15th and August 31st, wherever possible. Activities include the clearing of ornamental trees, as well as grassy areas, as many common bird species may also nest in these areas.
- If vegetation clearing must proceed during this time, a qualified biologist should be consulted to provide an opinion regarding the feasibility of an effective sweep, based on the areal extent and vegetation type present, prior to completing a nest sweep. The nest sweep should be conducted within seven days of tree and brush clearing, or within a specified period provided by the qualified biologist and should follow widely accepted protocols. Nests found during the sweep should be protected until the young have fledged using a species-appropriate buffer from construction activities.
- A wildlife sweep should be conducted within 10 days of any vegetation clearing scheduled outside the estimated breeding bird period (April 15th to August 31st). Some wildlife features (i.e. pileated woodpecker or raptor nests) cannot be damaged or disturbed regardless of occupation status. A wildlife biologist should be consulted to provide mitigation recommendations for any identified wildlife features.
- If vegetation clearing proceeds between February 15th to April 20th, a qualified biologist should be consulted to assess the risk to raptors, and provide recommendations.

- If soil stockpiles are present, they should be contoured with angles less than 70 degrees to create unsuitable nesting/den conditions for burrowing birds or other wildlife.
- Incorporate directional lighting into the design to minimize potential light pollution and sensory disturbance to wildlife species.
- Implement design and operational features and procedures to minimize bird strikes to the ESC clubhouse building, which could include patterned glass, exterior screens and lowering blinds or turning the lights off at night.

With the implementation of these mitigation measures, the residual impact associated with mortality or disturbance to protected wildlife and migratory breeding birds will be reduced to negligible.

6.2.6. Unanticipated Discoveries Associated with Archaeological or Cultural/Historical Resources

6.2.6.1. Potential Impacts

Although, unlikely given the high degree of historic disturbance in the study area, there is a potential for the discovery of archaeological resources, paleontological resources, historic period sites, and Aboriginal traditional use sites during construction. It is important to preserve and protect the historic resources of Alberta and inadvertent losses could occur if construction crews are not aware of this risk. An Historic Resources Act Approval (HRA Number: 4725-23-0052-001, dated December 21, 2023) has been granted for the Project (OPAC 2023).

Potential impacts to historical resources are considered unlikely to occur, but would have a direct, negative, low to moderate, permanent effect that is local.

6.2.6.2. Mitigation and Residual Impacts

The project should be undertaken in accordance with the HRA approval. In the event that contractors uncover/discover unanticipated archaeological resources, paleontological resources, historic period sites, and Aboriginal traditional use sites during construction, the notification/stop work process for unanticipated discoveries requirements would be applied and Alberta Culture and Tourism would be notified.

6.3. ASSESSMENT OF CUMULATIVE ENVIRONMENTAL IMPACTS

Cumulative impacts associated with the interaction of past, present, future (proposed) projects were considered for entire study area. Past projects initiated within Gallagher Park include historic uses as an incinerator site, as well as the current summer and winter uses associated with the Muttart Conservatory, Edmonton Folk Fest and Cloverdale Community League. As such, the project area is considered to have a high degree of historical disturbance.

Wildlife habitat connectivity modelling was conducted during the implementation of the preferred Concept Plan design for Gallagher park and concluded that there may be impacts to wildlife movement through Gallagher Park. No other VEC's were identified in the Concept design for Gallagher Park as being cumulatively impacted by the interactions of the preferred Concept Plan design in conjunction with any other past, present future (proposed) projects.

Given the scale and scope of the Gallagher Park Concept Plan design relative to the ESC project there is a negligible change to wildlife habitat connectivity from the baseline conditions described previously in the preferred Concept Plan design (Solstice 2021). Habitat connectivity analysis for chickadee (representing arboreal movement), and coyote (for winter and summer terrestrial movements) were assessed (Solstice 2021). Strong connective links are still present throughout the wooded and maintained grass areas of Gallagher Park.

7. ENVIRONMENTAL MONITORING

Through the review of potential project impacts it was determined that monitoring requirements are not mandated by regulatory approvals or permits for the implementation of the project. However, through the analysis of impacts and the recommended mitigation measures and Best Management Practices (BMPs), several monitoring recommendations were identified. These monitoring recommendations would require the ESC to self-monitor during future stages of project implementation, in particular construction and post-construction periods. The intent of such monitoring is to confirm compliance with specific plan requirements, such as the site-specific ECO Plan and other project plans, as well as confirming that all recommended mitigation measures have been implemented and are performing as intended.

It is anticipated that specific monitoring requirements, including the ones listed here, will be developed and refined as part of planning processes and controls during future construction of the ESC project. Key monitoring requirements that should be considered during construction and reclamation phases include:

- Contaminated Soils
 - Monitor any soils moved offsite or reused for PAHs or other potential soil exceedances (Shelby Engineering 2023).
- Soils and Surface Water
 - Monitor the performance of temporary erosion and sediment controls, particularly in relation to off-site migration of sediment that may enter catch basins or adjacent watercourses or waterbodies.
 - Monitor the margins of the disturbance area to ensure no deleterious substances migrate off-site.
- Vegetation
 - Monitor the performance of the Tree Preservation Plan in relation to the Corporate Tree Management Policy.
 - Monitor the project area for the introduction of weeds or exotic species following disturbance.
 - Monitor the reclamation/revegetation of disturbed areas and newly established naturalized areas.
- Wildlife
 - Monitor the clearing of vegetation if conducted within the breeding bird period through nest sweep surveys to reduce potential impacts. If nests are encountered establish a monitoring plan, including buffers to reduce impacts.

8. PUBLIC CONSULTATION

Public consultation was an integral part of the conceptualization of the Gallagher Park Concept Plan and multiple public and stakeholder engagement opportunities were initiated to solicit feedback and suggestions. The input of key stakeholders including site partners such as the Cloverdale Community League, Edmonton Folk Music Festival, Edmonton Ski Club, and the Muttart Conservatory, as well as the public were used to inform decisions about the direction and content of the plan, and to build a collaborative relationship among all stakeholders to support future decisions.

Public engagement initiatives were completed over three phases as follows:

- Phase 1 – Vision Statement and Guiding Principles and Idea Gathering, which was facilitated through open houses and online questionnaires.
- Phase 2 – Concept plan Development, which was facilitated through open houses and online questionnaires.
- Phase 3 – Draft Preferred Concept Plan, which could only be completed through online engagement due to the Covid-19 pandemic.

Stakeholders were involved in the first phase of the project in 2016 - 2017 with the planning of the Project Charter and Project Team Terms of Reference for the direction and success of this Concept Plan. During the summer of 2017, Indigenous Engagement took place for Gallagher Park in conjunction with the Dawson and Oleskiw Park Master Plan projects. Public consultation associated with the third phase of the project took place in 2020.

The ESC RVOAC project is in alignment with the Gallagher Park Concept Plan. Specific to the project, initial public consultation has been undertaken, with a summary of key findings summarized in January, 2023. Initial engagement was undertaken in 2021 and 2022 with community members, current user groups, and stakeholders to gain preliminary feedback on the direction of the project. Meetings, phone conversations and an Open House were held (City of Edmonton 2023a). Key findings from the initial engagement include the need for a multi-functional facility which will facilitate full season activities, presence of administrative spaces within the design, and meeting room(s) to be used by a variety of users and stakeholders. The ESC project held an open house on October 25th, 2023, to conduct public consultation to inform the public of the project details, and solicit feedback, concerns, and questions. Where feasible, this feedback will be incorporated into the project design.

9. CONCLUSIONS

9.1. SUMMARY OF ENVIRONMENTAL IMPACTS AND SENSITIVITIES

Based on the review of potential impacts anticipated to occur from the implementation of the ESC project, it is expected that all potential negative residual impacts will be reduced to negligible with the application of the recommended mitigation measures.

Of the VEC's that were identified, key environmental sensitivities that required further consideration included:

- Soil management, specifically soil erosion and sedimentation risk and management of historically contaminated soils,
- Groundwater impacts, specifically the potential for impacts from building pile drilling and installation of geothermal borefield,
- Potential for paleontological impacts in bedrock resulting from building pile drilling and installation of geothermal borefield,
- Impacts to native vegetation communities, and
- Changes to wildlife habitat and use, including wildlife connectivity.

Soil management, specifically management of historically contaminated soils will need to be potentially addressed at future stages of the project and will require the development and implementation of a site-specific risk management plan if any soil materials are expected to be moved off site or reused. All other environmental sensitivities related to soil, groundwater native vegetation communities and wildlife can be effectively addressed through various project controls and mitigation measures that will be implemented as the project proceeds to the next phases.

Overall, the ESC project is expected to have a minimal effect on environmental resources and is expected to result in a net positive impact to both vegetation and wildlife components through the establishment of new naturalized areas that will increase both local biodiversity and wildlife habitat. In that regard, we are of the opinion that the proposed ESC project can proceed as planned.

9.2. ASSESSMENT LIMITATIONS AND KEY MITIGATION MEASURES

As the project specifications provided to Solstice only provides a high-level overview of the proposed enhancements to the ESC activity center, no specific information on preliminary or detailed design was provided. In that regard, specific information concerning detailed design drawings or specifications and

construction measures were not included as part of this assessment. However, a conservative approach was taken in developing recommended mitigation measures that address any potential negative environmental impacts in a proactive manner that can be implemented as part of planning processes and controls during future construction of the ESC project.

Key mitigation measures that the City of Edmonton should consider mandating as action items to be included as part of the implementation the preferred Concept Plan design are as follows:

- Temporary erosion and sediment control measures should be utilized to prevent soil erosion and the off-site release of sediments.
- A site-specific risk management plan developed based on the recommendations from the Tier 2 Risk Assessment completed by AECOM (2017) is required if project works disturb soils within the vicinity of the area of known historical contamination, located west of the potential physical project impacts.
- Ensure that a site-specific risk management plan is developed if any soils contaminated with trace PAHs are to be moved offsite or reused.
- Ensure compliance with all mitigation measures outlined in Section 6.2.4.2 that address vegetation clearing and the Corporate Tree Management Policy, including:
 - ◆ Prepare detailed naturalization or reclamation plans as part of the detailed design phase.
 - ◆ Prepare and implement a Tree Protection Plan.
 - ◆ Prepare and implement a weed management plan, including weed control measures for any identified noxious or prohibited noxious weeds.
 - ◆ Initiate prompt revegetation of cleared areas.
- Ensure compliance with all federal and provincial requirements pertaining to wildlife including:
 - Avoid vegetation clearing during the breeding bird season (April 15th to August 31st).
 - If soil stockpiles are present, they should be contoured with angles less than 70 degrees to create unsuitable nesting/den conditions for burrowing birds or other wildlife.
 - If important habitats or species (protected under government legislation) are discovered, work should be postponed until a wildlife biologist can recommend a species appropriate buffer zone.
- Ensure compliance with ECO plan and other environmental regulations required under ENVISIO including but not limited to:
 - Development and implementation of site-specific temporary ESC measures.
 - Development and implementation of a spill mitigation and control plan and emergency response plan.
 - Development and implementation of a hazardous waste management plan.

10. REFERENCES

- [AAF] Alberta Agriculture and Forestry. Agricultural Region of Alberta Soil Inventory Database (AGRASID).c2021. Edmonton (AB): Alberta Agriculture and Forestry; [accessed 2023 Jun 10]. <https://soil.agric.gov.ab.ca/agrasidviewer/>
- [AECOM] AECOM Canada Ltd. 2017. Tier 2 Risk Assessment: Muttart Conservatory/Gallagher Park. Edmonton (AB): AECOM Canada Ltd.
- [AECOM] AECOM Canada Ltd. 2020. Gallagher Park Seepage Remedial Options Assessment Draft for Comment. (letter report). Edmonton (AB): AECOM Canada Ltd.
- [ACIMS] Alberta Conservation Information Management System. c2023. Alberta Conservation Information Management System (ACIMS). Edmonton (AB): Alberta Parks; [accessed 2023 Feb 16]. <https://www.albertaparks.ca/albertaparksca/management-land-use/alberta-conservation-information-management-system-acims/>.
- [AEP] Alberta Environment and Parks. c2020. Alberta Floods – Flood Hazard Maps. Edmonton (AB): Alberta Environment and Parks; [accessed 2023 Feb 16]. <https://floods.alberta.ca/>.
- [AEP] Alberta Environment and Parks. 2015. Alberta Wetland Classification System. Edmonton (AB): Alberta Environment and Parks, Water Policy Branch; [accessed 2023 Sep 14]. 66 p. <https://open.alberta.ca/dataset/92fbfbf5-62e1-49c7-aa13-8970a099f97d/resource/1e4372ca-b99c-4990-b4f5-dbac23424e3a/download/2015-Alberta-Wetland-Classification-System-June-01-2015.pdf>.
- [AER]. Alberta Energy Regulator. 2015. Coal Mine Map Viewer. Edmonton (AB): Alberta Energy Regulator; [accessed 2024 Jan 02]; <https://extmapviewer.aer.ca/AERCoalMine/Index.html>
- Alberta Culture. 2023. Alberta Listing of Historic Resources – Updated March 31, 2023. Edmonton (AB): Alberta Culture. [accessed 2023 Sept 21]. <https://open.alberta.ca/publications/4211759#summary>
- Andriashek, L.D. 1988. Quaternary Stratigraphy of the Edmonton Map Area NTS 83H. Edmonton (AB): Terrain Sciences Department, Natural Resources Division, Alberta Research Council. Open File Report #198804.
- [ANPC] Alberta Native Plant Council. 2012. Alberta Native Plant Council (ANPC) Guidelines for Rare Vascular Plant Surveys in Alberta, 2012 Update. Edmonton (AB): Alberta Native Plant Council; [accessed 2023 Sep 14]. 25 p. <https://anpc.ab.ca/wp-content/uploads/2015/01/Guidelines-For-Rare-Plant-Surveys-in-AB-2012-Update.pdf>.
- Beier, P, Brost, B. 2010. Use of land facets to plan for climate change: conserving the arenas, not the actors. *Conservation Biology*. 24(3):701-10.
- City of Edmonton. 2005a. Erosion and Sedimentation Guidelines.
- City of Edmonton. 2005b. Erosion and Sedimentation Field Manual.
- City of Edmonton. 2014. Urban primary land and vegetation inventory (uPLVI) interpretation manual. Greenlink Forestry Inc. 4th ed. Edmonton (AB): City of Edmonton; [accessed 2023 Sep 14]. 60 p. <https://data.edmonton.ca/download/skyj-by77/application%2Fpdf>
- City of Edmonton. 2015. Urban Ecological Field Guide for the City of Edmonton, Alberta. Greenlink Forestry inc. 2nd Edition. Edmonton (AB): City of Edmonton; [accessed 2023 Oct 03]. <https://data.edmonton.ca/download/9bjx-3yz5/application%2Fpdf>

- City of Edmonton. 2016. Short Term Risk Management Plan for the Construction of the Muttart Conservatory Storage Building – Gallagher Park. 9626 – 96A Street, Edmonton, Alberta. Integrated Infrastructure Services, Business Planning and Support. City of Edmonton. July 2016.
- City of Edmonton. 2020. Gallagher Park Concept Plan Design Report. September 2020 Draft.
- City of Edmonton. 2023a. Community Led Business Case. Edmonton Ski Club River Valley Outdoor Activities Centre Project. Part 1 – Strategy, and Part 2 – Concept. February 2023 ver. 2.
- City of Edmonton. 2023b. Zoning – City of Edmonton. SLIM Maps. [Accessed 2023 Oct 16]. <https://maps.edmonton.ca/map.aspx?lookingFor=Zoning>
- [FWMIS] Fisheries and Wildlife Management Information System. c2023. Fish and Wildlife Internet Mapping Tool - Public. Edmonton (AB): Alberta Environment and Parks; [accessed 2023 Feb 16]. https://maps.alberta.ca/FWIMT_Pub/Viewer/?TermsOfUseRequired=true&Viewer=FWIMT_Pub.
- [GoC] Government of Canada. c2018. General Nesting Periods of Migratory Birds. Ottawa (ON): Government of Canada, Environment and Natural Resources; [accessed 2023 Sep 14]. https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/general-nesting-periods.html#_04.
- [GoC] Government of Canada. 2022. Migratory Birds Regulations. [Accessed 2023 Oct 27]. <https://laws-lois.justice.gc.ca/eng/regulations/SOR-2022-105/index.html>
- Koen EL, Bowman J, Sadowski C, Walpole AA. 2014. Landscape connectivity for wildlife: development and validation of multispecies linkage maps. *Methods in Ecology and Evolution*. 5:626-633.
- LaPoint, S., Gallery, P., Wikelski, M., Kays, R. 2013. Animal behavior, cost-based corridor models and real corridors. *Landscape Ecology*. 28:1615-1630.
- Moss, E.H. 1983. *Flora of Alberta*. Second Edition. Revised by John G. Packer.
- [OPAC] Online Permitting and Clearance System. 2023. Historical Resources Act Approval for Project Name: Edmonton Ski Club - River Valley Outdoor Activity Centre, Dated December 21, 2023. HRA Number: 4725-23-0052-001.
- [Shelby] Shelby Engineering. 2023. Geotechnical Investigation - ESC-River Valley Outdoor Activity Centre. September 25, 2023. Edmonton (AB): Shelby Engineering Ltd., prepared for Edmonton Ski Club C/O WSP Projects Inc.
- [Solstice] Solstice Canada Corp. 2017. City of Edmonton Environmental Sensitivities Project Mapping and Analysis Methodology. Edmonton (AB): Solstice Canada Corp.
- [Solstice] Solstice Canada Corp. 2019. Gallagher Park concept plan environmental overview. Edmonton (AB): Solstice Canada Corp.
- [Solstice] Solstice Canada Corp. 2021a. Gallagher Park Concept Plan Environmental Impact Assessment. May 28, 2021. Available at https://www.edmonton.ca/projects_plans/parks_recreation/gallagher-park-master-plan
- [Solstice] Solstice Canada Corp. 2021b. Gallagher Park Concept Plan Site Location Study. May 28, 2021. Available at https://www.edmonton.ca/projects_plans/parks_recreation/gallagher-park-master-plan
- [Solstice] Solstice Canada Corp. 2023a. Phase I Environmental Site Assessment. Portion of 9313 96th Avenue, Edmonton, Alberta, T6C 2B3. Portion of Lot 1, Block 7, Plan 1522550.
- [Solstice] Solstice Canada Corp. 2023b. Phase I Environmental Site Assessment Addendum Portion of 9313 96th, Edmonton Ski Club.

- Spear, S.F., Balkenhol, N., Fortin, M-J, McRae, B.H., Scribner, K. 2010. Use of resistance surfaces for landscape generic studies: considerations for parameterization and analysis. *Molecular Ecology*. 19:3576-3591.
- [Spencer Environmental] Spencer Environmental Management Services Ltd. 2013. Valley Line-Stage 1 LRT Project Environmental Impact Screening Assessment. Edmonton (AB): Spencer Environmental Management Services Ltd., prepared for LRT D and C Transportation Services, City of Edmonton.
- Thurber Engineering. 2012. Edmonton Southeast LRT Extension: Quarters to Connors Road: an Overall Appraisal of Geotechnical Conditions Along the LRT Alignment. Edmonton (AB): Thurber Engineering.
- Zeller, K.A., McGarigal, K., Whiteley, A.R. 2012. Estimating Landscape Resistance to Movement: a Review. *Landscape Ecology*. 27:777-797

APPENDIX A. SPECIES TABLES



TABLE A1. Vegetation Species by Community Type

| Vegetation Strata | Vegetation Species (Common Name, Scientific Name) | Origin |
|--|---|---------|
| Mixed Deciduous Manitoba Maple (MD.3) | | |
| Tree | Balsam Poplar (<i>Populus balsamifera</i>) | Native |
| Tree | Burr Oak (<i>Quercus macrocarpa</i>) | Unknown |
| Tree | Manitoba Maple (<i>Acer negundo</i>) | Native* |
| Tree | Trembling Aspen (<i>Populus tremuloides</i>) | Native |
| Tree | White Spruce (<i>Picea glauca</i>) | Native |
| Shrub | Cherry Species (<i>Prunus</i> spp.) | Native |
| Shrub | Choke Cherry (<i>Prunus virginiana</i>) | Native |
| Shrub | Common Caragana (<i>Caragana arborescens</i>) | Exotic |
| Shrub | High-Bush Cranberry (<i>Viburnum opulus</i>) | Native |
| Shrub | Prickly Rose (<i>Rosa acicularis</i>) | Native |
| Shrub | Red-oiser Dogwood (<i>Cornus stolonifera</i>) | Native |
| Shrub | Spreading Dogbane (<i>Apocynum androsaemifolium</i>) | Native |
| Forb | Alsike Clover (<i>Trifolium hybridum</i>) | Exotic |
| Forb | Canada Thistle (<i>Cirsium arvense</i>) | Noxious |
| Forb | Common Dandelion (<i>Taraxacum officinale</i>) | Exotic |
| Forb | Common Plantain (<i>Plantago major</i>) | Exotic |
| Forb | Common Tansy (<i>Tanacetum vulgare</i>) | Noxious |
| Forb | Creeping Thistle (<i>Cirsium arvense</i>) | Noxious |
| Forb | Star-Flowered Solomon's-Seal (<i>Maianthemum stellatum</i>) | Native |
| Forb | Woolly Burdock (<i>Arctium tomentosum</i>) | Noxious |
| Graminoid | Crested Wheatgrass (<i>Agropyron cristatum</i>) | Exotic |
| Graminoid | Kentucky Bluegrass (<i>Poa pratensis</i>) | Native* |
| Graminoid | Smooth Brome (<i>Bromus inermis</i>) | Exotic |
| Mixed Deciduous Mixed Shrubs (MD.1) | | |
| Tree | Balsam Poplar (<i>Populus balsamifera</i>) | Native |
| Tree | Manitoba Maple (<i>Acer negundo</i>) | Native* |
| Tree | Trembling Aspen (<i>Populus tremuloides</i>) | Native |
| Tree | White Birch (<i>Betula papyrifera</i>) | Native |
| Shrub | Beaked Hazelnut (<i>Corylus cornuta</i>) | Native |
| Shrub | Prickly Rose (<i>Rosa acicularis</i>) | Native |
| Shrub | Red-oiser Dogwood (<i>Cornus stolonifera</i>) | Native |
| Shrub | Saskatoon (<i>Amelanchier alnifolia</i>) | Native |
| Shrub | Snowberry (<i>Symphoricarpos albus</i>) | Native |
| Shrub | Wild Black Currant (<i>Ribes americanum</i>) | Native |
| Forb | Canada Thistle (<i>Cirsium arvense</i>) | Noxious |
| Forb | Common Dandelion (<i>Taraxacum officinale</i>) | Exotic |
| Forb | Common Fireweed (<i>Chamerion angustifolium</i>) | Native |
| Forb | Common Plantain (<i>Plantago major</i>) | Exotic |
| Forb | Lindley's Aster (<i>Symphotrichum ciliolatum</i>) | Native |
| Forb | Northern Bedstraw (<i>Galium boreale</i>) | Native |
| Forb | Tufted Vetch (<i>Vicia cracca</i>) | Exotic |
| Forb | Veiny Meadow Rue (<i>Thalictrum venulosum</i>) | Native |
| Forb | White Clover (<i>Trifolium alba</i>) | Exotic |
| Forb | Woolly Burdock (<i>Arctium tomentosum</i>) | Noxious |
| Graminoid | Foxtail Barley (<i>Hordeum jubatum</i>) | Native* |
| Graminoid | Kentucky Bluegrass (<i>Poa pratensis</i>) | Native* |
| Graminoid | Slender Wheatgrass (<i>Elymus trachycaulus</i>) | Native |

TABLE A1. Vegetation Species by Community Type

| Vegetation Strata | Vegetation Species (Common Name, Scientific Name) | Origin |
|------------------------------|---|----------|
| Maintained Grass (MG) | | |
| Tree | Manitoba Maple (<i>Acer negundo</i>) | Native* |
| Tree | Tamarack (<i>Larix spp.</i>) | Native* |
| Tree | White Spruce (<i>Picea glauca</i>) | Native |
| Forb | Alsike Clover (<i>Trifolium hybridum</i>) | Exotic |
| Forb | Black Medick (<i>Medicago lupulina</i>) | Exotic |
| Forb | Canada Thistle (<i>Cirsium arvense</i>) | Noxious |
| Forb | Common Dandelion (<i>Taraxacum officinale</i>) | Exotic |
| Forb | Common Fireweed (<i>Chamerion angustifolium</i>) | Native |
| Forb | Kochia (<i>Kochia scoparia</i>) | Invasive |
| Forb | Tufted Vetch (<i>Vicia cracca</i>) | Exotic |
| Forb | White Sweet-Clover (<i>Melilotus alba</i>) | Exotic |
| Forb | Woolly Burdock (<i>Arctium tomentosum</i>) | Noxious |
| Forb | Yellow Toadflax (<i>Linaria vulgaris</i>) | Noxious |
| Graminoid | Kentucky Bluegrass (<i>Poa pratensis</i>) | Native* |
| Graminoid | Smooth Brome (<i>Bromus inermis</i>) | Exotic |
| Graminoid | Thickspike Wheatgrass (<i>Elymus lanceolatus</i>) | Native |
| Urban Residential | | |
| Tree | Balsam Poplar (<i>Populus balsamifera</i>) | Native |
| Tree | Manitoba Maple (<i>Acer negundo</i>) | Native* |
| Tree | White Spruce (<i>Picea glauca</i>) | Native |
| Forb | Alsike Clover (<i>Trifolium hybridum</i>) | Exotic |
| Forb | Black Medick (<i>Medicago lupulina</i>) | Exotic |
| Forb | Canada Thistle (<i>Cirsium arvense</i>) | Noxious |
| Forb | Common Dandelion (<i>Taraxacum officinale</i>) | Exotic |
| Forb | Kochia (<i>Kochia scoparia</i>) | Invasive |
| Forb | White Sweet-Clover (<i>Melilotus alba</i>) | Exotic |
| Forb | Woolly Burdock (<i>Arctium tomentosum</i>) | Noxious |
| Forb | Yellow Toadflax (<i>Linaria vulgaris</i>) | Noxious |
| Graminoid | Kentucky Bluegrass (<i>Poa pratensis</i>) | Native* |
| Graminoid | Smooth Brome (<i>Bromus inermis</i>) | Exotic |

Note: Species status from ACIMCS (2023). Astrisk indicates species likely from landscaping origins.

TABLE A2. Wildlife Expected to Occur within Study Area

| Common Name | Scientific Name | Provincial Status | Wildlife Act Designation | COSEWIC Designation | SARA Designation | Preferred Habitat | Residency Status | Study Area Habitat Suitability | Reason for Inclusion |
|-------------------------|----------------------------------|-------------------|--------------------------|-----------------------------|------------------------------|--|------------------|--|--|
| Herptiles | | | | | | | | | |
| Canadian Toad | <i>Bufo hemiophry</i> | May be at Risk | Data Deficient | Not at Risk | - | Springs, streams, marshes and other permanent water bodies, usually with abundant aquatic vegetation | Resident | Not Suitable | FWMIS Results |
| Columbia Spotted Frog | <i>Rana luteiventris</i> | Sensitive | - | Not at Risk | - | Associated with mixed coniferous and subalpine forest areas with permanent water | Resident | Not Suitable | FWMIS Results |
| Boreal Toad | <i>Anaxyrus boreas boreas</i> | Undetermined | - | Special Concern | - | Wetlands, lake and river shores, meadows and forests, breeding in shallow aquatic habitats, often beaver ponds. Over winter in peat hummocks, crevices and burrows | Resident | Not Suitable | FWMIS Results |
| Northern Leopard Frog | <i>Lithobates pipiens</i> | At Risk | Threatened | Special Concern | Schedule 1 (Special Concern) | Wet meadows, pastures, shrubland and lightly wooded areas | Resident | Not Suitable | FWMIS Results |
| Plains Garter Snake | <i>Thamnophis radix</i> | Sensitive | - | Moderate Priority Candidate | - | Generalist. Frequents water | Resident | Some suitable habitat present | FWMIS Results |
| Red-sided Garter Snake | <i>Thamnophis sirtalis</i> | Sensitive | - | Low Priority Candidate | - | Generalist; Frequents water and woodlands | Resident | Some suitable habitat present | FWMIS Results |
| Birds | | | | | | | | | |
| Alder Flycatcher | <i>Empidonax alnorum</i> | Secure | - | - | - | Edges of wet areas, in willow and birch thickets, muskeg edges and streamside vegetation | Migrant | Not Suitable | eBird Results |
| American Coot | <i>Fulica americana</i> | Secure | - | - | - | Shallow marshes, ponds, wetlands with open water and emergent vegetation | Migrant | Not Suitable | eBird Results |
| American Crow | <i>Corvus brachyrhynchos</i> | Secure | - | - | - | Urban areas, agricultural fields and shrublands | Migrant | Suitable breeding and foraging habitat present | 2020 Observation (Visual), eBird Results |
| American Goldfinch | <i>Spinus tristis</i> | Secure | - | - | - | Open forests, fields, meadows, roadsides and townsites | Migrant | Suitable breeding and foraging habitat present | eBird Results |
| American Redstart | <i>Setophaga ruticilla</i> | Secure | - | - | - | Mature deciduous forests, shrubbery, avalanche slopes, willow patches and lowland forests, often near water | Migrant | Little suitable habitat present | eBird Results |
| American Robin | <i>Turdus migratorius</i> | Secure | - | - | - | Townsites, forests, ranchlands, forest edges and roadsides | Migrant | Suitable breeding and foraging habitat present | 2020 Observation (Visual), eBird Results |
| American Tree Sparrow | <i>Spizella arborea</i> | Secure | - | High Priority Candidate | - | Brushy thickets, roadside shrubs, semi-open fields and agricultural areas | Migrant | Suitable breeding and foraging habitat present | eBird Results |
| American White Pelican | <i>Pelecanus erythrorhynchos</i> | Sensitive | - | Not at Risk | - | Breeds colonially on large lakes or rivers | Migrant | Not Suitable | eBird Results |
| American Wigeon | <i>Mareca americana</i> | Secure | - | - | - | Shallow wetlands, lake edges, ponds | Migrant | Not Suitable | eBird Results |
| Bald Eagle | <i>Haliaeetus leucocephalus</i> | Sensitive | - | Not at Risk | - | Large lakes, rivers, cooling ponds, open areas | Migrant | Transitory use | eBird Results |
| Baltimore Oriole | <i>Icterus galbula</i> | Secure | - | - | - | Deciduous, riparian and mixed forests | Migrant | Suitable habitat present | eBird Results |
| Bank Swallow | <i>Riparia riparia</i> | Sensitive | - | Threatened | Threatened | Steep banks, lakeshores and open areas | Migrant | Not Suitable | eBird Results |
| Barred Owl | <i>Strix varia</i> | Sensitive | - | - | - | Mature coniferous and mixedwood forests, often in riparian areas | Resident | Requires larger blocks of mature forest without any fragmentation, little suitable habitat available | FWMIS Results, eBird Results |
| Bay-breasted Warbler | <i>Setophaga castanea</i> | Sensitive | - | - | - | Mature riparian and coniferous forests, dependent on old growth forests | Migrant | Little suitable breeding habitat present | eBird Results |
| Belted Kingfisher | <i>Megaceryle alcyon</i> | Secure | - | - | - | Large rivers, lakes, and beaver ponds, adjacent to exposed banks | Migrant | Transitory use | eBird Results |
| Black-and-white Warbler | <i>Mniotilta varia</i> | Secure | - | - | - | Deciduous or mixedwood forests, often near water, and alder and willow thickets bordering muskegs and pools | Migrant | Suitable breeding and foraging habitat present | eBird Results |
| Black-backed Woodpecker | <i>Dryobates arcticus</i> | Sensitive | - | - | - | Coniferous forests, disturbed areas | Resident | Suitable nesting and foraging habitat present | eBird Results |
| Black-billed Magpie | <i>Pica hudsonia</i> | Secure | - | - | - | Open forests, agricultural areas, riparian thickets, townsites, campgrounds | Resident | Suitable nesting and foraging habitat present | 2020 & 2023 Observation (Auditory), 2024 Winter Tracking Observation, eBird Results |
| Black-capped Chickadee | <i>Poecile atricapillus</i> | Secure | - | - | - | Aspen forests, riparian woodlands, urban areas, backyard feeders, willow groves and mixed forests | Resident | Suitable nesting and foraging habitat present | 2020 Observation (Auditory), 2023 Observation (Visual and Auditory), 2024 Winter Tracking Observation (Visual and Auditory), eBird Results |

TABLE A2. Wildlife Expected to Occur within Study Area

| Common Name | Scientific Name | Provincial Status | Wildlife Act Designation | COSEWIC Designation | SARA Designation | Preferred Habitat | Residency Status | Study Area Habitat Suitability | Reason for Inclusion |
|----------------------|-------------------------------------|-------------------|--------------------------|------------------------|------------------------------|--|------------------|--|--|
| Blackpoll Warbler | <i>Setophaga striata</i> | Secure | - | Low Priority Candidate | - | Black spruce forests, muskeg bogs, burns and occasionally mixed forests | Migrant | Some suitable foraging habitat present | eBird Results |
| Blue Jay | <i>Cyanocitta cristata</i> | Secure | - | - | - | Mixed deciduous forests, agricultural areas and townsites | Resident | Suitable nesting and foraging habitat present | 2020 & 2023 Observation (Auditory), eBird Results |
| Blue-headed Vireo | <i>Vireo solitarius</i> | Secure | - | - | - | Coniferous forests mixed with deciduous trees, frequently with dense understory shrubs | Migrant | Suitable nesting and foraging habitat present | eBird Results |
| Blue-winged Teal | <i>Spatula discors</i> | Secure | - | - | - | Shallow lake edges/wetlands, prefers areas of short but dense emergent vegetation | Migrant | Not Suitable | eBird Results |
| Bohemian Waxwing | <i>Bombycilla garrulus</i> | Secure | - | - | - | Summer: open coniferous forests, frequently near water. Winter: townsites | Resident | Suitable habitat present | eBird Results |
| Bonaparte's Gull | <i>Chroicocephalus philadelphia</i> | Secure | - | Low Priority Candidate | - | Large lakes, rivers, marshlands | Migrant | Transitory use | eBird Results |
| Brown Creeper | <i>Certhia americana</i> | Sensitive | - | - | - | Mainly coniferous forests, such as spruce, fir, and pine | Undetermined | Mature forest dependent species, little suitable habitat present | FWMIS Results, eBird Results |
| Brown-headed Cowbird | <i>Molothrus ater</i> | Secure | - | - | - | Fields, shrublands, forest edges, roadsides, mountain meadows, landfills, campgrounds, day use areas and near large mammals | Migrant | Suitable habitat present | eBird Results |
| Bufflehead | <i>Bucephala albeola</i> | Secure | - | - | - | Open water of lakes, ponds, rivers. Breeding: small, wooded ponds and small lakes | Migrant | Not Suitable | eBird Results |
| California Gull | <i>Larus californicus</i> | Secure | - | - | - | Large lakes, wetlands, farmlands, landfills, parks | Migrant | Transitory use | eBird Results |
| Canada Goose | <i>Branta canadensis</i> | Secure | - | - | - | Lakeshores, riverbanks, ponds, farmlands, city parks | Migrant | foraging and nesting habitat present | eBird Results |
| Canada Warbler | <i>Cardellina canadensis</i> | May be at Risk | - | Special Concern | Schedule 1 (Threatened) | Willow and alder thickets, riparian shrublands and dense understories, shrub forest on slopes and ravines but prefers mature forests in the winter. During migration in woodlands with dense understory including floodplain forests | Migrant | Some suitable breeding habitat present | eBird Results |
| Cedar Waxwing | <i>Bombycilla cedrorum</i> | Secure | - | - | - | Forest edges, deciduous forests, shrublands and riparian woodlands | Migrant | Suitable habitat present | eBird Results |
| Chipping Sparrow | <i>Spizella passerina</i> | Secure | - | - | - | Dry coniferous forests, mixed forests, pure deciduous forests and forest edges | Migrant | Suitable habitat present | eBird Results |
| Clay-colored Sparrow | <i>Spizella pallida</i> | Secure | - | - | - | Forest edges, open deciduous forests, birch and willow shrubs, patches of rose bushes | Migrant | Suitable habitat present | eBird Results |
| Common Goldeneye | <i>Bucephala clangula</i> | Secure | - | - | - | Ponds, lakes and rivers | Migrant | Not Suitable | eBird Results |
| Common Merganser | <i>Mergus merganser</i> | Secure | - | - | - | large rivers, deep lakes | Migrant | Not Suitable | eBird Results |
| Common Raven | <i>Corvus corax</i> | Secure | - | - | - | Grasslands, shrublands, townsites, campgrounds and landfills | Resident | Suitable habitat present | eBird Results |
| Common Redpoll | <i>Acanthis flammea</i> | Secure | - | - | - | Open fields, meadows, roadsides, townsites, railways and forest edges | Resident | Suitable habitat present | eBird Results |
| Common Yellowthroat | <i>Geothlypis trichas</i> | Sensitive | - | - | - | Cattail marshes, riparian willow and alder clumps, sedge wetlands and beaver ponds | Migrant | Not Suitable | eBird Results |
| Cooper's Hawk | <i>Accipiter cooperii</i> | Secure | - | Not at Risk | - | Mixed woodlands, riparian woodlands, and suburban areas; usually soars on thermals in open areas during migration | Migrant | Little suitable habitat present | eBird Results |
| Dark-eyed Junco | <i>Junco hyemalis</i> | Secure | - | - | - | Coniferous and mixed wood forests, shrublands, roadsides, wooded urban areas, forest edges and avalanche slopes | Resident | Suitable habitat present | 2023 Observation (Auditory), eBird Results |
| Downy Woodpecker | <i>Dryobates pubescens</i> | Secure | - | - | - | All wooded environments, including aspen forests and tall deciduous shrubs | Resident | Suitable habitat present | 2024 Winter Tracking Observation (Visual), eBird Results |
| Eastern Kingbird | <i>Tyrannus tyrannus</i> | Sensitive | - | - | - | Open areas with willow and birch shrubs, agricultural areas and riparian regions | Migrant | Suitable habitat present | eBird Results |
| Eastern Phoebe | <i>Sayornis phoebe</i> | Sensitive | - | - | - | Forest edges or clearings, near lakes or rivers | Migrant | Transitory use | eBird Results |
| European Starling | <i>Sturnus vulgaris</i> | Exotic/Alien | - | - | - | Forest edges, townsites, agricultural areas, landfills roadsides | Resident | Suitable habitat present | eBird Results |
| Evening Grosbeak | <i>Coccothraustes vespertinus</i> | Secure | - | Special Concern | Schedule 1 (Special Concern) | Summer: open coniferous forests. Winter: townsites, cottages and deciduous forests | Resident | Some suitable habitat present | eBird Results |
| Franklin's Gull | <i>Leucophaeus pipixcan</i> | Secure | - | - | - | Agricultural fields, marshlands, meadows, lakes, rivermouths and landfills | Migrant | Transitory use | eBird Results |

TABLE A2. Wildlife Expected to Occur within Study Area

| Common Name | Scientific Name | Provincial Status | Wildlife Act Designation | COSEWIC Designation | SARA Designation | Preferred Habitat | Residency Status | Study Area Habitat Suitability | Reason for Inclusion |
|-----------------------------|--|-------------------|--------------------------|------------------------|------------------------------|--|------------------|-----------------------------------|---|
| Gadwall | <i>Anas strepera</i> | Secure | - | - | - | Shallow wetlands, lake borders, beaver ponds | Migrant | Not Suitable | eBird Results |
| Golden-crowned Kinglet | <i>Regulus satrapa</i> | Secure | - | - | - | Breeds in Edmonton. Mixed and pure forests of spruce, pine and fir | Migrant | Suitable habitat present | eBird Results |
| Gray Catbird | <i>Dumetella carolinensis</i> | Secure | - | - | - | Dense thickets and shrublands, often near water | Migrant | Some suitable habitat present | eBird Results |
| Gray-cheeked Thrush | <i>Catharus minimus</i> | Undetermined | - | - | - | During migration in forested areas, parks and backyards | Migrant | Suitable habitat present | eBird Results |
| Great Blue Heron | <i>Ardea herodias</i> | Sensitive | - | - | - | Edges of waterbodies, seen in fields/wet meadows | Migrant | Not Suitable | eBird Results |
| Great Horned Owl | <i>Bubo virginianus</i> | Secure | - | - | - | Mixed forests, agricultural areas, shrublands and riparian woodlands | Resident | Suitable habitat present | eBird Results |
| Greater White-fronted Goose | <i>Anser albifrons</i> | Secure | - | - | - | During migration in croplands, fields, open areas/shallow marshes | Migrant | Some suitable habitat present | eBird Results |
| Green-winged Teal | <i>Anas crecca carolinensis</i> | Secure | - | - | - | Shallow lakes, wetlands, beaver ponds, meandering rivers | Migrant | Not Suitable | eBird Results |
| Hairy Woodpecker | <i>Dryobates villosus</i> | Secure | - | - | - | Aspen, spruce and mixed forests | Resident | Suitable habitat present | 2020 & 2023 Observation (Auditory), eBird Results |
| Hermit Thrush | <i>Catharus guttatus</i> | Secure | - | - | - | Spruce-fir forests, avalanche slopes and pine forests | Migrant | Not Suitable | eBird Results |
| Herring Gull | <i>Larus argentatus</i> | Secure | - | - | - | During migration in large lakes, wetlands, rivers, landfills, and public areas | Migrant | Not Suitable | eBird Results |
| House Finch | <i>Haemorhous mexicanus</i> | Secure | - | - | - | Primarily urban, cities, towns and agricultural areas | Resident | Suitable habitat present | eBird Results |
| House Sparrow | <i>Passer domesticus</i> | Exotic/Alien | - | - | - | Townsites, agricultural areas, railyards and developed areas, absent from undeveloped areas | Resident | Suitable habitat present | eBird Results |
| House Wren | <i>Troglodytes aedon</i> | Secure | - | - | - | Aspen forests, shrublands and dense understory vegetation | Migrant | Some suitable habitat present | eBird Results |
| Least Flycatcher | <i>Empidonax minimus</i> | Secure | - | - | - | Aspen forests and alder and willow thickets | Migrant | Suitable habitat present | eBird Results |
| Lesser Scaup | <i>Aythya affinis</i> | Secure | - | - | - | Woodland ponds and lake edges with grassy margins | Migrant | Not Suitable | eBird Results |
| Lincoln's Sparrow | <i>Melospiza lincolnii</i> | Secure | - | - | - | Shrubby meadows, shoreline forests, roadsides, bog edges and wetlands with emergent sedges and tall shoreline vegetation | Migrant | Suitable habitat present | eBird Results |
| Magnolia Warbler | <i>Setophaga magnolia</i> | Secure | - | - | - | Open coniferous and mixed forests, often near water | Migrant | Some suitable habitat present | eBird Results |
| Mallard | <i>Anas platyrhynchos</i> | Secure | - | - | - | Lakes, wetlands, rivers, springs, city parks, agricultural areas | Migrant | Not Suitable | eBird Results |
| Merlin | <i>Falco columbarius</i> | Secure | - | Not at Risk | - | Breeding in mixed and coniferous forests; suburban areas | Migrant | Suitable habitat present | eBird Results |
| Mountain Bluebird | <i>Sialia currucoides</i> | Secure | - | Low Priority Candidate | - | Open forests, forest edges, burned forests, agricultural areas and grasslands | Migrant | Suitable nesting habitat present | eBird Results |
| Northern Flicker | <i>Colaptes auratus</i> | Secure | - | - | - | Open mixed woodlands, forest edges, fields and meadows | Migrant | Suitable habitat present | eBird Results |
| Northern Goshawk | <i>Accipiter gentilis atricapillus</i> | Sensitive | - | Not at Risk | - | Breeding in mature coniferous, deciduous and mixed woodlands. Non-breeding in forest edges, parks, farmland | Resident | Suitable breeding habitat present | FWMIS Results, eBird Results |
| Northern Saw-whet Owl | <i>Aegolius acadicus</i> | Secure | - | - | - | Pure and mixed coniferous and deciduous forests | Resident | Suitable habitat present | eBird Results |
| Northern Shoveler | <i>Anas clypeata</i> | Secure | - | - | - | Shallow marshes/bogs/lakes with muddy bottom and emergent vegetation, in open and semi open areas | Migrant | Not Suitable | eBird Results |
| Northern Shrike | <i>Lanius excubitor</i> | Secure | - | - | - | Shrublands, grasslands and roadsides | Migrant | Some suitable habitat present | eBird Results |
| Northern Waterthrush | <i>Parkesia noveboracensis</i> | Secure | - | - | - | Deciduous and riparian thickets, forests and streams | Migrant | Suitable habitat present | eBird Results |
| Olive-sided Flycatcher | <i>Contopus cooperi</i> | May be at Risk | - | Special Concern | Schedule 1 (Special Concern) | Mature spruce-fir and riparian forests and burned over woodlands | Migrant | Not Suitable | eBird Results |
| Orange-crowned Warbler | <i>Oreothlypis celata</i> | Secure | - | - | - | Deciduous or mixed forests, shrubby avalanche slopes, woodlands and riparian thickets | Migrant | Suitable habitat present | eBird Results |
| Ovenbird | <i>Seiurus aurocapillus</i> | Secure | - | - | - | Riparian and deciduous forests and shrubbery; occasionally in mixed woods with semi-open undergrowth | Migrant | Suitable habitat present | eBird Results |
| Palm Warbler | <i>Setophaga palmarum</i> | Secure | - | - | - | Semi-open habitats, including bogs, fields and wetlands bordered by woodlands | Migrant | Transitory use | eBird Results |

TABLE A2. Wildlife Expected to Occur within Study Area

| Common Name | Scientific Name | Provincial Status | Wildlife Act Designation | COSEWIC Designation | SARA Designation | Preferred Habitat | Residency Status | Study Area Habitat Suitability | Reason for Inclusion |
|---------------------------|---|-------------------|--------------------------|-------------------------|------------------------------|--|------------------|---|--|
| Peregrine Falcon | <i>Falco peregrinus anatum/tundrius</i> | At Risk | Threatened | Not at Risk | Not on Schedule 1 | Lakeshores, river valleys, urban areas, alpine meadows, river mouths, and open fields. During migration in open areas | Migrant | Some suitable foraging habitat present | FWMIS Results, eBird Results |
| Philadelphia Vireo | <i>Vireo philadelphicus</i> | Secure | - | - | - | Willow stands in deciduous forests | Migrant | Not Suitable | eBird Results |
| Pileated Woodpecker | <i>Dryocopus pileatus</i> | Sensitive | - | - | - | Mature coniferous or mixedwood forests, prefers areas with dead and dying trees | Resident | Suitable foraging and nesting habitat present | 2023 Observation (Forage), 2024 Winter Tracking Observation, eBird Results |
| Pine Grosbeak | <i>Pinicola enucleator</i> | Secure | - | - | - | Spruce-fir forests; townsites from fall to spring | Resident | Not Suitable | eBird Results |
| Pine Siskin | <i>Spinus pinus</i> | Secure | - | - | - | Coniferous and aspen forests, forest edges, meadows, townsites, roadsides, agricultural areas, grasslands | Migrant | Suitable habitat present | 2020 Observation (Auditory), eBird Results |
| Purple Finch | <i>Haemorhous purpureus</i> | Secure | - | - | - | Pine, spruce, and mixed forests and townsites | Migrant | Suitable habitat present | eBird Results |
| Red Crossbill | <i>Loxia curvirostra</i> | Secure | - | - | - | Coniferous forests, especially lodgepole pine, but also spruce-fir forests | Resident | Not Suitable | eBird Results |
| Red-breasted Merganser | <i>Mergus serrator</i> | Secure | - | - | - | Lakes and large rivers | Migrant | Not Suitable | eBird Results |
| Red-breasted Nuthatch | <i>Sitta canadensis</i> | Secure | - | - | - | Spruce-fir and pine forests | Resident | Some suitable habitat present | eBird Results |
| Red-eyed Vireo | <i>Vireo olivaceus</i> | Secure | - | - | - | Deciduous forests with semi-open canopies and shrublands | Migrant | Suitable habitat present | eBird Results |
| Red-tailed Hawk | <i>Buteo jamaicensis</i> | Secure | - | Not at Risk | - | Open country with some trees, roadsides, fields, mixed woods | Migrant | Some suitable habitat present | eBird Results |
| Red-winged Blackbird | <i>Agelaius phoeniceus</i> | Secure | - | - | - | Cattail marshes, wet meadows, croplands and shoreline shrubs | Migrant | Not Suitable | eBird Results |
| Ring-billed Gull | <i>Larus delawarensis</i> | Secure | - | - | - | Lakes, rivers, landfills, golf courses, fields, parks | Migrant | Some suitable habitat present | eBird Results |
| Ring-necked Duck | <i>Aythya collaris</i> | Secure | - | - | - | Wooded ponds, swamps, marshes, sloughs with emergent vegetation | Migrant | Not Suitable | eBird Results |
| Ring-necked Pheasant | <i>Phasianus colchicus</i> | Exotic/Alien | - | - | - | Shrubby grasslands, pastures, ditches, fields and occasionally croplands | Resident | Suitable habitat present | eBird Results |
| Rock Pigeon | <i>Columba livia</i> | Exotic/Alien | - | - | - | Urban areas, railway yards, agricultural areas, grain terminals and elevators, high sandstone cliffs provide a more natural habitat for some | Resident | Suitable habitat present | eBird Results |
| Rose-breasted Grosbeak | <i>Pheucticus ludovicianus</i> | Secure | - | - | - | Deciduous, mixed and riparian woodlands and wooded urban parks | Migrant | Suitable habitat present | eBird Results |
| Ruby-crowned Kinglet | <i>Regulus calendula</i> | Secure | - | - | - | Lodgepole pine, fir and black spruce forests | Migrant | Not Suitable | eBird Results |
| Ruby-throated Hummingbird | <i>Archilochus colubris</i> | Secure | - | - | - | Open aspen forests, parks and gardens | Migrant | Suitable habitat present | eBird Results |
| Savannah Sparrow | <i>Passerculus sandwichensis</i> | Secure | - | - | - | Moist meadows, marshy edges and weedy fields | Migrant | Some suitable habitat present | eBird Results |
| Sharp-shinned Hawk | <i>Accipiter striatus</i> | Secure | - | Not at Risk | - | Dense to semi-open forests, occasionally along rivers, soars on thermals in open areas during migration | Migrant | Suitable habitat present | eBird Results |
| Short-eared Owl | <i>Asio flammeus</i> | May be at Risk | - | Threatened | Schedule 1 (Special Concern) | Open country, including grasslands, wet meadows and cleared forests | Undetermined | Little suitable habitat present | FWMIS Results |
| Solitary Sandpiper | <i>Tringa solitaria</i> | Secure | - | High Priority Candidate | - | Breeds in heavily forested wetlands. During migration wet meadows, sewage lagoons, muddy ponds, sedge wetlands and beaver ponds | Migrant | Not Suitable | eBird Results |
| Song Sparrow | <i>Melospiza melodia</i> | Secure | - | - | - | Willow shrublands and shrubby riparian areas | Migrant | Not Suitable | eBird Results |
| Spotted Sandpiper | <i>Actitis macularius</i> | Secure | - | - | - | Shorelines, gravel beaches, ponds, rivers, marshes, alluvial wetlands and streams | Migrant | Not Suitable | eBird Results |
| Swainson's Hawk | <i>Buteo swainsoni</i> | Secure | - | - | - | Openfields, grasslands, sagebrush and agricultural sites | Migrant | Suitable habitat present | eBird Results |
| Swainson's Thrush | <i>Catharus ustulatus</i> | Secure | - | - | - | Coniferous and mixed wood forests and steep ravines | Migrant | Suitable habitat present | eBird Results |
| Tennessee Warbler | <i>Oreothlypis peregrina</i> | Secure | - | - | - | Coniferous or mixed mature forests and occasionally spruce bogs | Migrant | Suitable habitat present | eBird Results |
| Trumpeter Swan | <i>Cygnus buccinator</i> | Sensitive | Threatened | Not at Risk | - | Lakes and large wetlands | Migrant | Not Suitable | eBird Results |
| Tundra Swan | <i>Cygnus columbianus</i> | Secure | - | - | - | During migration in shallow lake and wetland areas, agricultural fields, flooded pastures | Migrant | Not Suitable | eBird Results |

TABLE A2. Wildlife Expected to Occur within Study Area


| Common Name | Scientific Name | Provincial Status | Wildlife Act Designation | COSEWIC Designation | SARA Designation | Preferred Habitat | Residency Status | Study Area Habitat Suitability | Reason for Inclusion |
|------------------------------|----------------------------------|-------------------|--------------------------|------------------------|------------------------------|--|------------------|--|---|
| Varied Thrush | <i>Ixoreus naevius</i> | Secure | - | - | - | Coniferous forests, especially engelmann spruce and lodgepole pine | Migrant | Not Suitable | eBird Results |
| Vesper Sparrow | <i>Pooecetes gramineus</i> | Secure | - | - | - | Grasslands, semi open shrublands and agricultural areas | Migrant | Suitable habitat present | eBird Results |
| Warbling Vireo | <i>Vireo gilvus</i> | Secure | - | - | - | Open deciduous forests | Migrant | Suitable habitat present | eBird Results |
| Western Grebe | <i>Aechmophorus occidentalis</i> | At Risk | Threatened | Special Concern | Schedule 1 (Special Concern) | Breeds in large lakes with dense emergent vegetation or thick mats of floating aquatic plants | Migrant | Not Suitable | eBird Results |
| Western Tanager | <i>Piranga ludoviciana</i> | Sensitive | - | - | - | Mature coniferous or mixedwood forests and aspen woodlands | Migrant | Suitable habitat present | eBird Results |
| Western Wood-Pewee | <i>Contopus sordidulus</i> | May be at Risk | - | - | - | Open woodlands and deciduous ponderosa pine and riparian forests | Migrant | Suitable habitat present | eBird Results |
| White-breasted Nuthatch | <i>Sitta carolinensis</i> | Secure | - | - | - | Aspen and mixedwood forests and backyards | Resident | Suitable habitat present | 2020 & 2023 Observation (Auditory), 2024 Winter Tracking Observation, eBird Results |
| White-crowned Sparrow | <i>Zonotrichia leucophrys</i> | Secure | - | - | - | Open environments with shrubby meadows, krummholz, bogs, alpine and riparian willow shrubs | Migrant | Not Suitable | eBird Results |
| White-throated Sparrow | <i>Zonotrichia albicollis</i> | Secure | - | Low Priority Candidate | - | Willow shrublands, mixed forest edges, mixed deciduous forests, river flooded plains and brushy areas | Migrant | Suitable habitat present | 2023 Observation (Auditory), eBird Results |
| Willow Flycatcher | <i>Empidonax traillii</i> | Secure | - | - | - | Willow and dwarf birch thickets | Undetermined | Not Suitable | eBird Results |
| Wilson's Snipe | <i>Gallinago delicata</i> | Secure | - | - | - | Pond edges, damp fields, bogs, fens, alder and willow swamps, wet meadows, and along rivers and ponds with thick, low vegetation | Migrant | Not Suitable | eBird Results |
| Wilson's Warbler | <i>Cardellina pusilla</i> | Secure | - | - | - | Shrubby shorelines, willow and alder thickets, wet meadows, avalanche slopes, revegetated burns and krummholz areas | Migrant | Not Suitable | eBird Results |
| Yellow Warbler | <i>Setophaga petechia</i> | Secure | - | - | - | Wet, shrubby meadows, willow tangles and shrubby avalanche slopes, usually near water | Migrant | Not Suitable | eBird Results |
| Yellow-bellied Sapsucker | <i>Sphyrapicus varius</i> | Secure | - | - | - | Deciduous and mixed woods | Migrant | Suitable habitat present | eBird Results |
| Yellow-rumped Warbler | <i>Setophaga coronata</i> | Secure | - | - | - | All forested areas, especially coniferous forests | Migrant | Suitable habitat present | eBird Results |
| Mammals | | | | | | | | | |
| Cougar | <i>Puma concolor</i> | Secure | - | - | - | Remote, woody, rocky places | Resident | Transitory use | FWMIS Results |
| Little Brown Bat | <i>Myotis lucifugus</i> | May be at Risk | - | Endangered | Schedule 1 (Endangered) | Cold humid caves/mines in the winter. Often roosting on/in buildings or large diameter trees. Foraging occurs near/over water | - | Some roosting habitat present but unlikely | FWMIS Results |
| Northern Long-eared Bat | <i>Myotis septentrionalis</i> | May be at Risk | Data Deficient | Endangered | Schedule 1 (Endangered) | Forested areas adjacent to rocky outcrops or badlands landscapes, occasionally buildings, mines and caves | Resident | Little summer roosting habitat present | FWMIS Results |
| White-tailed Prairie Hare | <i>Lepus townsendii</i> | Secure | - | - | - | Urban areas, grass areas and parks, foraging on shrubs and trees in the winter | Resident | Suitable habitat present | Professional Judgement |
| White-tailed Deer | <i>Odocoileus virginianus</i> | Secure | - | - | - | Aspen groves, grasslands and fields near scattered patches of trees | Resident | Suitable habitat present | Professional Judgement, 2024 Winter Tracking Observation |
| Coyote | <i>Canis latrans</i> | Secure | - | - | - | Well adapted to many different areas but mostly found in urban areas, parks, woodlands and shrublands | Resident | Suitable habitat present | Professional Judgement, 2024 Winter Tracking Observation |
| Porcupine | <i>Erethizon dorsatum</i> | Secure | - | - | - | Coniferous, mixed and deciduous stands | Resident | Suitable summer and winter habitat present | Professional Judgement |
| Moose | <i>Alces alces</i> | Secure | - | - | - | Forested areas with streams, ponds and muskeg | Resident | Some suitable habitat present | Professional Judgement |
| Richardson's Ground Squirrel | <i>Urocitellus richardsonii</i> | Secure | - | - | - | Pastures, cultivated crops and other open habitats with short vegetation cover | Resident | Suitable habitat present | Professional Judgement |
| Red Squirrel | <i>Sciurus vulgaris</i> | Secure | - | - | - | Forests, trees | Resident | Suitable habitat present | 2020 Observation (Visual and Auditory) |
| Striped Skunk | <i>Mephitis mephitis</i> | Secure | - | - | - | Farmlands, grasslands, forests and urban areas | Resident | Suitable habitat present | Professional Judgement |

*LP Candidate (SSC) – Low Priority Candidate for assessment by COSEWIC, recommended by Species Specialist Subcommittee (SSC)

**MP Candidate (SSC) - Moderate Priority Candidate for assessment by COSEWIC, recommended by Species Specialist Subcommittee (SSC)


APPENDIX B. REPRESENTATIVE SITE PHOTOGRAPHS





| | |
|--|--|
|  | Date October 3, 2023 |
| | Orientation South |
| | Description Mixed Deciduous Manitoba Maple (MD.3) vegetation community |
| Photograph 1. | |


| | |
|--|---|
|  | Date October 3, 2023 |
| | Orientation South |
| | Description Maintained Grass (MG) vegetation community |
| Photograph 2. | |


| | |
|---|--|
|  | Date October 3, 2023 |
| | Orientation West |
| | Description Mixed Deciduous Mixed Shrubs (MD.1) vegetation community |
| Photograph 3. | |

| | |
|--|--|
|  | Date October 3, 2023 |
| | Orientation South |
| | Description Mixed Deciduous Mixed Shrubs (MD.1) vegetation community |
| Photograph 4. | |

| | |
|--|--|
|  | Date October 3, 2023 |
| | Orientation Down |
| | Description Soil Profile within Mixed Deciduous Manitoba Maple (MD.3) vegetation community |
| | Photograph 5. |

| | |
|---|---|
|  | Date October 3, 2023 |
| | Orientation Up |
| | Description W04 1.5 cm cavities in balsam poplar snag in Mixed Deciduous Manitoba Maple (MD.3) vegetation community |
| | Photograph 6. |

| | |
|--|---|
|  | Date October 3, 2023 |
| | Orientation Up |
| | Description Squirrel nest in Siberian Large in Mixed Deciduous Manitoba Maple (MD.3) vegetation community |
| | Photograph 7. |



| | |
|--|--|
|  | Date October 3, 2023 |
| | Orientation North |
| | Description WE07, noxious weed species Yellow Toadflax in Mixed Deciduous Manitoba Maple (MD.3) vegetation community |
| | Photograph 8. |



| |
|--|
| Date October 3, 2023 |
| Orientation Southwest |
| Description WE03 noxious weed species woolly burdock in Maintained Grass (MG) vegetation community |
| Photograph 9. |



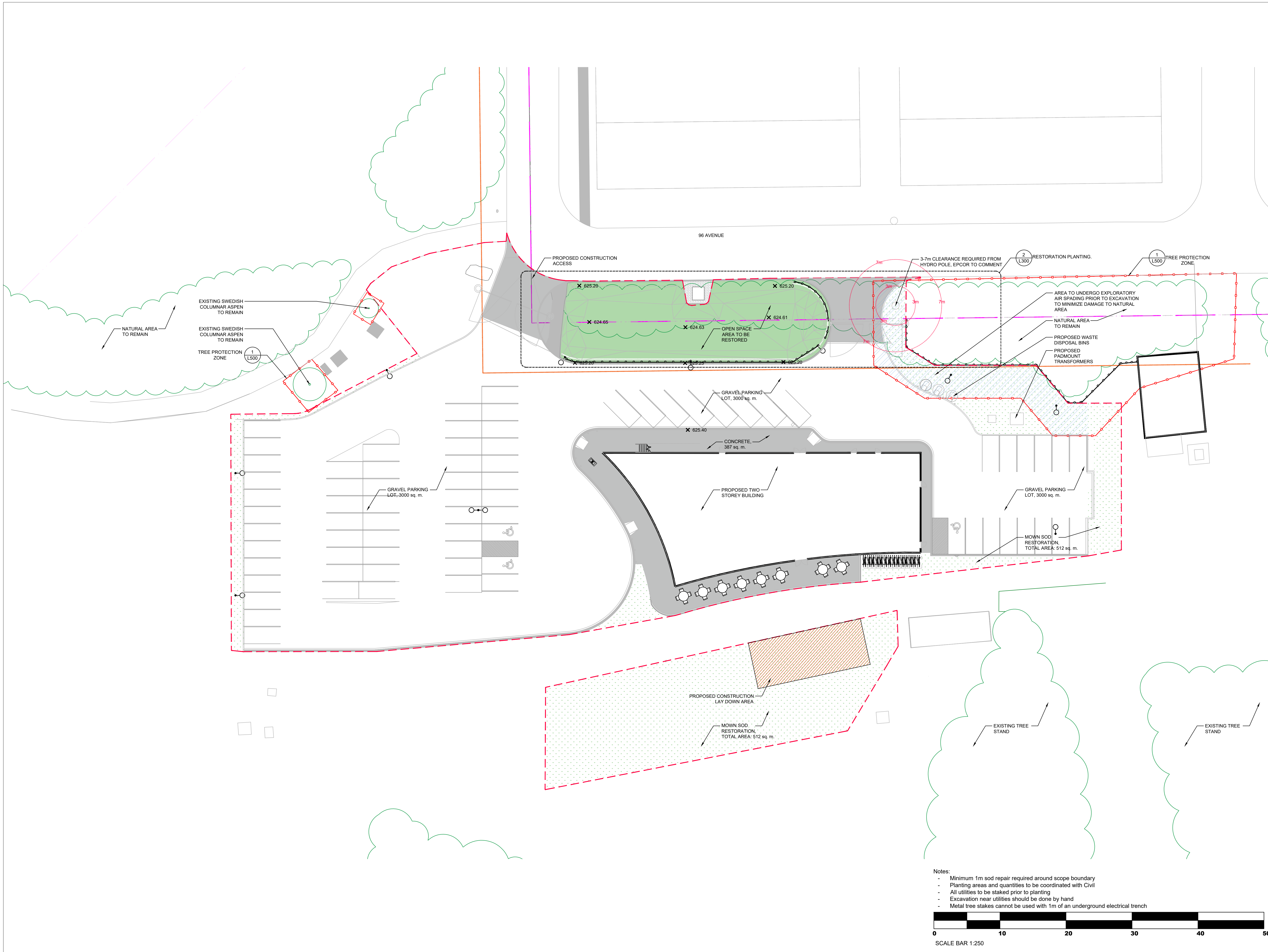
| |
|--|
| Date October 3, 2023 |
| Orientation South |
| Description WE05 noxious weed species Canada thistle in Maintained Grass (MG) vegetation community |
| Photograph 10. |

| | |
|--|---|
|  | <p>Date January 25, 2024</p> <p>Orientation East</p> <p>Description Habitat at midpoint of winter tracking Transect A</p> <p>Photograph 11.</p> |
|  | <p>Date January 25, 2024</p> <p>Orientation North</p> <p>Description Habitat at midpoint of winter tracking Transect B</p> <p>Photograph 12.</p> |

APPENDIX C. PLANS

Appendix C1 – Landscape Restoration Plan

Appendix C2 – Vegetation Removal Plan



NOTES

The following note shall apply to all drawings and associated documents:
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These Contract Documents are the property of the Landscape Architect. The Landscape Architect bears no responsibility for the interpretation of these documents by the Contractor. Upon written application the Landscape Architect will provide written clarification or supplementary information regarding the intent of the Contract Documents. The Landscape Architect will review Shop Drawings submitted by the Contractor for design conformance only.

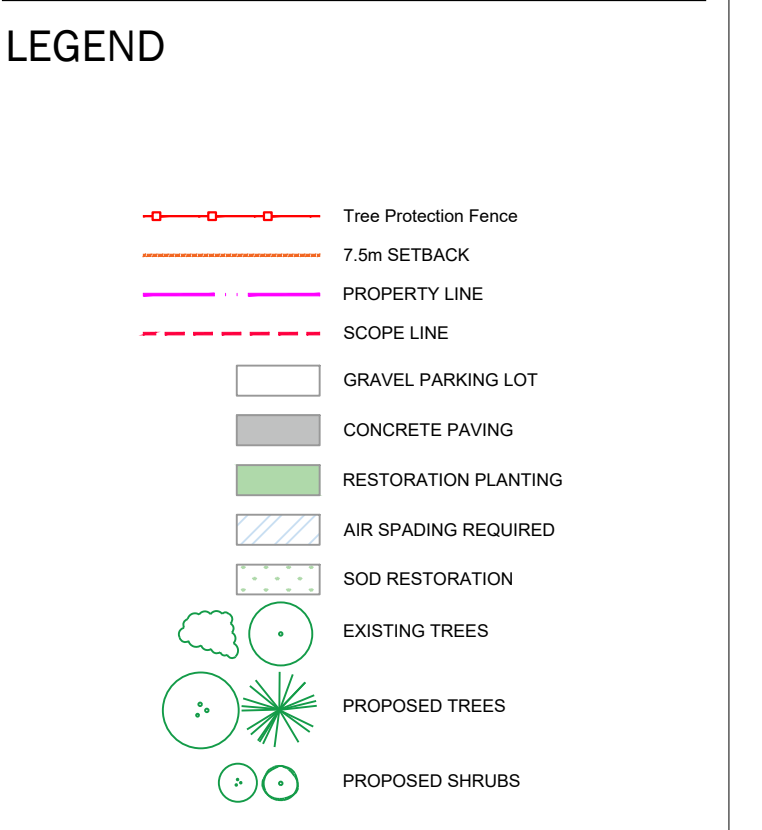
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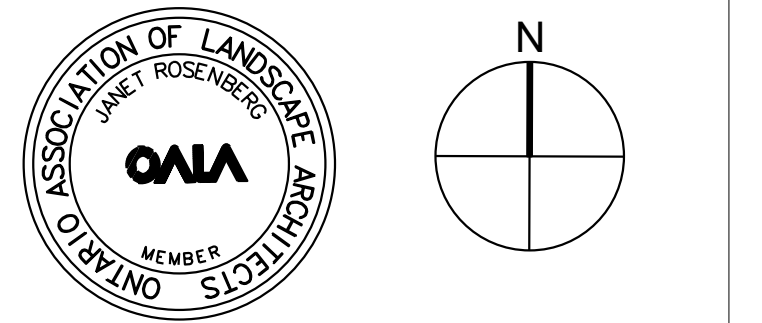
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| 1 | 2024-02-02 ISSUED FOR PLANTING RESTORATION PLAN |



Janet Rosenberg & Studio
 Landscape Architecture and Urban Design
 416 656 6665 | 416 656 5756 www.jrstudio.ca
 148 Kenwood Avenue, Toronto Ontario M6C 2S3 Canada

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 9613 96 Ave NW, Edmonton, AB T6C 2B3

LANDSCAPE RESTORATION LAYOUT PLAN

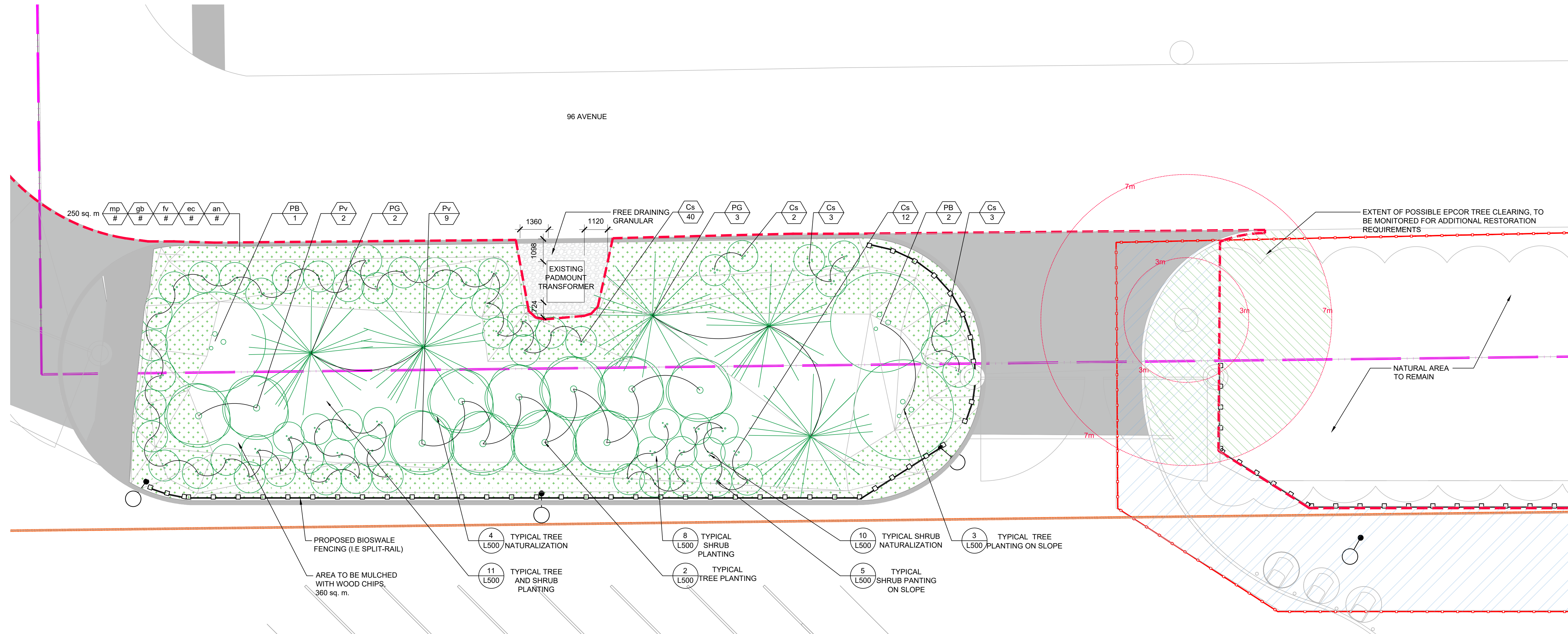
SCALE: 1:250
 DRAWN: JRS
 CHECKED: MV
 PROJECT NUMBER: 23-050
 DRAWING DATE: 2023-09-15

Notes:

- Minimum 1m sod repair required around scope boundary
- Planting areas and quantities to be coordinated with Civil
- All utilities to be staked prior to planting
- Excavation near utilities should be done by hand
- Metal tree stakes cannot be used with 1m of an underground electrical trench

SCALE BAR 1:250

L002



1 RESTORATION PLANTING
SCALE: 1 : 100

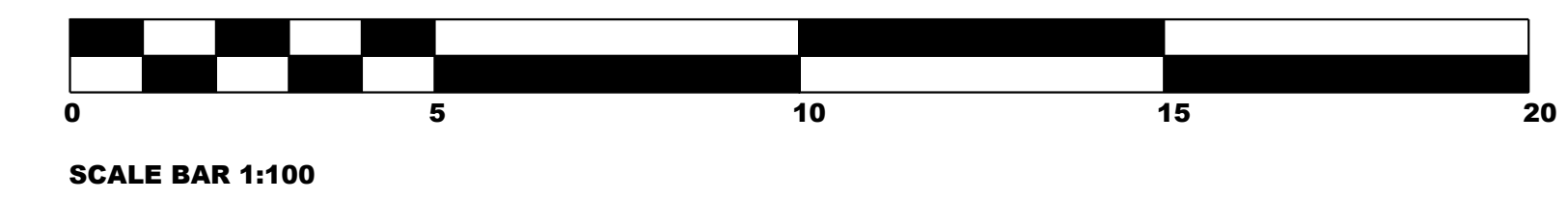
| PROPOSED AT GRADE PLANT LIST | | | | | | | | | | |
|--|----------|-----------------------|-------------------|----------|-----------|----------------------|--------|------------|--|------------|
| Key | Quantity | Botanical | Common | Spacing | Condition | Size | Native | Non-Native | Notes | Indigenous |
| TREES | | | | | | | | | | |
| PB | 3 | Populus balsamifera | Balsam Poplar | As Drawn | WB | min: 90mm max: 120mm | Yes | | Treeform | Y |
| PG | 5 | Picea glauca | White Spruce | As Drawn | WB | min: 90mm max: 120mm | Yes | | Sizing Varies | Y |
| SHRUBS | | | | | | | | | | |
| Pv | 11 | Prunus virginiana | Chokecherry | As Drawn | WB | 75 cm | Yes | | Refer to Drawing | N |
| Cs | 60 | Cornus sericea | Red Osier Dogwood | As Drawn | WB | 100 cm | Yes | | Refer to Drawing | Y |
| HYDROSEED MIX FOR BERM PLANTING | | | | | | | | | | |
| an | 10% | Aralia nudicaulis | Wild Sarsaparilla | - | SEED | | Yes | | Hydroseeded - min. ratio of 13.98kg/ha | Y |
| ec | 40% | Elymus canadensis | Canada Wild Rye | - | SEED | | Yes | | Hydroseeded - min. ratio of 13.98kg/ha | N |
| fv | 20% | Fragaria virginiana | Wild Strawberry | - | SEED | | Yes | | Hydroseeded - min. ratio of 13.98kg/ha | N |
| gb | 10% | Galium boreale | Northern Bedstraw | - | SEED | | Yes | | Hydroseeded - min. ratio of 13.98kg/ha | N |
| mp | 20% | Martensia pinnatifida | Tall Lungwort | - | SEED | | Yes | | Hydroseeded - min. ratio of 13.98kg/ha | N |

2 PLANTING SCHEDULE
SCALE: NTS

Planting Calculation:
 TOTAL PARKING SPACES: 74
 TOTAL AREA OF LANDSCAPE ISLAND REQUIRED: 148 sq. m
 No. OF REQUIRED TREES: 8
 No. OF REQUIRED SHRUBS: 15

No. OF PROPOSED TREES: 8
 No. OF PROPOSED SHRUBS: 71
 No. OF PROPOSED PERENNIALS (HYDROSEEDING): approx. 1000

- Notes:
- Minimum 1m sod repair required around scope boundary
 - Planting areas and quantities to be coordinated with Civil
 - All utilities to be staked prior to planting
 - Excavation near utilities should be done by hand
 - Metal tree stakes cannot be used with 1m of an underground electrical trench



NOTES

The following note shall apply to all drawings and associated documents:
 Copyright of this drawing and design is reserved by the Designer. The drawing and all associated documents are an instrument of service by the Designer. The drawing and the information contained therein may not be reproduced in whole or in part without prior written permission of the designer.

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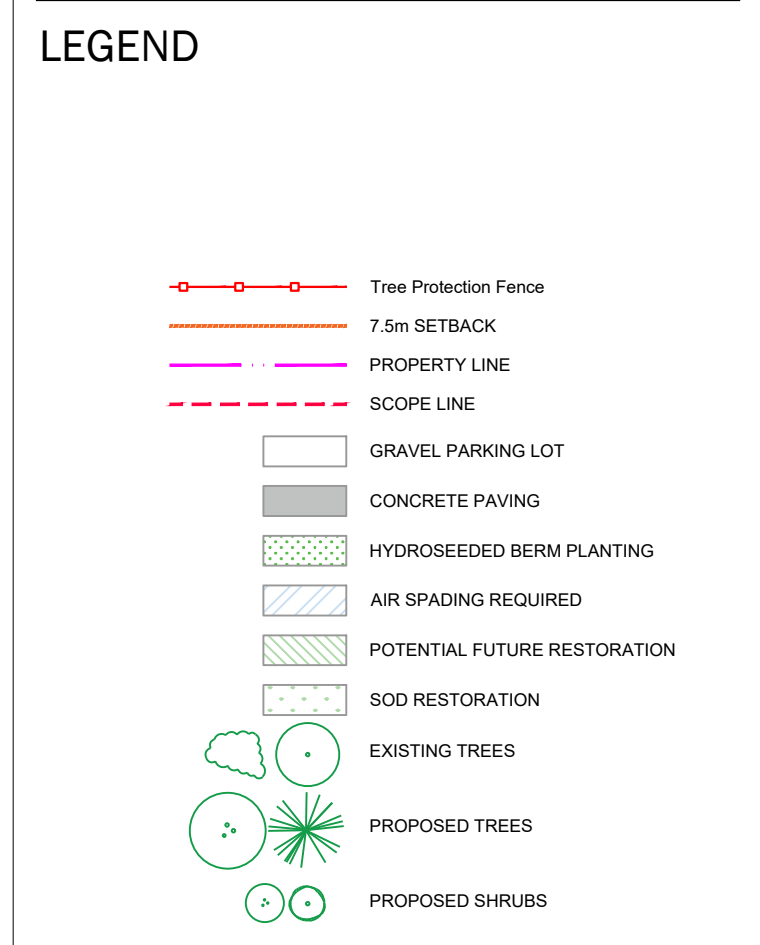
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| 1 | 2024-02-02 | ISSUED FOR PLANTING RESTORATION PLAN |

ASSOCIATION OF LANDSCAPE ARCHITECTS
 ONTARIO MEMBER
 JANET ROSENBERG ARCHITECTS

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 Landscape Architecture and Urban Design
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EDMONTON SKI CLUB

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LANDSCAPE RESTORATION PLANTING PLAN

SCALE: VARIES
 DRAWN: JRS
 CHECKED: SG
 PROJECT NUMBER: 23-050
 DRAWING DATE: 2023-09-15

L003

Arborist Report - Detailed Vegetation Removal Plan – Edmonton Ski Club

EIA Reference No: 493421780-001

Project No: ECT 16.1.2024

January 29, 2024

| REVISION HISTORY | | | | |
|-------------------------|------------------|---|--|---|
| Revision # | Date | Revision Reason | Reviewed By | Approving Body |
| 0 | January 22, 2024 | Original Document | Emma Dunn, Associate GEC Architecture | Shareen Breen, Urban Forester Natural Areas |
| 1 | January 27, 2024 | Added static targets to Appendix 2 Site Map | Emma Dunn, Associate GEC Architecture | Shareen Breen, Urban Forester Natural Areas |
| 2 | January 29, 2024 | Added number of trees to be removed under Section 2.0 Scope of Work | Emma Dunn, Associate GEC Architecture | Shareen Breen, Urban Forester Natural Areas |

Prepared for:

GEC Architecture
#310, 14055 West Block Dr NW
Edmonton, Alberta
T5N 1L8

Contact: Emma Dunn, Associate
Emma.dunn@gecarchitecture.com
780 421-8060

Prepared by:

UrbFor Consulting Ltd.
ISA Certified Arborist PR-4880A
Andre Savaria RPF #317
alsavar@telusplanet.net
780 288-8680





January 29, 2024

GEC Architecture
#310, 14055 West Block Dr NW
Edmonton, Alberta
T5N 1L8

Attention: Emma Dunn

**RE: Vegetation Removal Plan – Edmonton Ski Club Outdoor Activity Center
(Project No: ECT 16.1.2024)**

This report summarizes our field observations of existing trees and details for removal at 9613 – 96 Avenue NW in Edmonton, Alberta.

This vegetation removal plan is a requirement of the City of Edmonton Planning and Environment Services as per letter dated December 21, 2023. This report combines data layers provided from other parties including Janet Rosenberg & Studio and GEC Architecture.

Preliminary recommendations are provided to ensure that all legal requirements, approvals and logistical considerations are met. All final decisions for tree removal will be made by the City of Edmonton Urban forestry representatives.

Amendments or updates to this plan will be submitted on as needed basis.

Please get back to me if you have any questions or concerns with this report.

Regards,

A handwritten signature in blue ink, appearing to read "AS", with a long horizontal line extending to the right.

Andre Savaria RPF#317
ISA Certified Arborist PR-4880A
Certified Tree Risk Assessor (TRAQ)
UrbFor Consulting Ltd.
Cell 780-288-8680



Table of Contents

| | |
|--|----------|
| 1.0 Introduction | 4 |
| 2.0 Scope of Work..... | 5 |
| 3.0 Site Conditions and Targets | 6 |
| 4.0 Proposed Operations – Clearing and Disposal | 6 |
| 5.0 Scheduling | 7 |
| 6.0 Logistics and Safety Considerations..... | 7 |
| LIMITATIONS | 9 |

List of Appendices

- Appendix 1 City of Edmonton Plan Requirements (December 21, 2023)
- Appendix 2 Site Plan for Vegetation Removal

1.0 Introduction

Vegetation removal is being proposed to facilitate safe and effective construction and operation of the Edmonton Ski Club Facilities located in Gallagher Park on the south side of the North Saskatchewan River valley adjacent to downtown Edmonton. Approximately 360 m² of treed land are projected to be cleared based on the Tree Removal Plan L001 dated 2020-09-15. This vegetation removal plan has been requested by the City of Edmonton in support of Development Permit and EIA application – see **Appendix 1**.

The municipal address and legal description are as follows:

9613 96 Avenue NW, Edmonton, Alberta
Lot 1, Block 7, Plan 1522560
Cloverdale Neighbourhood
Gallagher Park

The current zoning is A – River Valley Zone which provides the opportunity for preserving natural areas and parkland along the river, creeks, ravines and other designated areas for recreational uses and environmental protection conforming to approved plans.



**Figure 1. Edmonton Ski Club –
Google Image 2017**

2.0 Scope of Work

The proposed clearing includes approximately 360 m² of deciduous trees and shrubs.

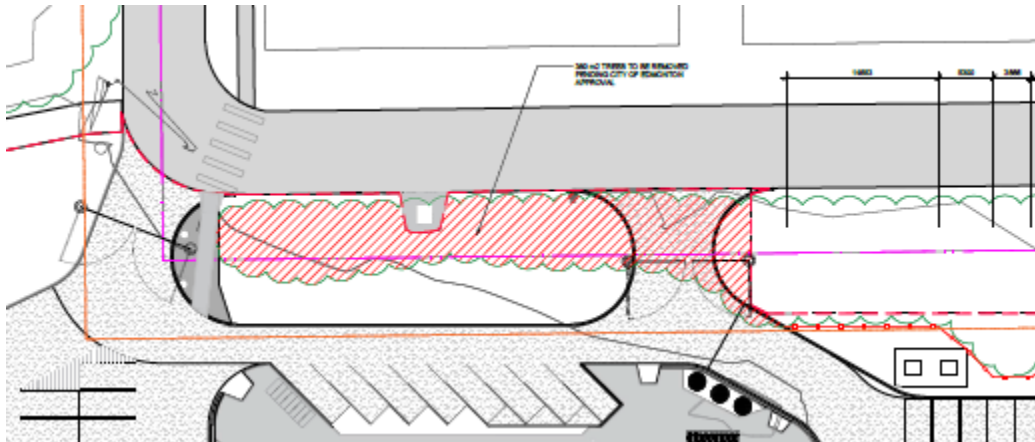


Figure 2. Tree Removal Plan (L001 dated 2023-09-15)

A total count of the trees of significance was carried out based on trunk diameters of 20 cms or larger at 1.4 meters above ground. The trees to be removed at this site consist of 12 *Acer negundo* (Manitoba Maple) that range in height from 2 meters to over 11 meters. The largest diameter live maple noted within this stand was approximately 24.5 cms. There are also 4 *Populus balsamifera* (balsam poplar) which have been previously topped and these exceed 30 cms in diameter.



Figure 3. View to East of Trees to be Removed (Photo From Summer 2023).

3.0 Site Conditions and Targets

The site is level with no drainages identified within the proposed clearing boundary. The soils appear to be largely clay with adjacent gravel to the south. In terms of critical infrastructure that could impact tree clearing operations, there are the following static targets

- Transformer
- Epcor Power Pole and overhead lines to the east
- 96 Avenue road way
- 96 Avenue south side curb
- Traffic signs
- Metal access gate on the west side

There is also a snow fence that has been installed on the south of 96 Avenue and a smaller dumpster at the south and east end. These targets have been identified in **Appendix 2** Site Plan for Vegetation Removal.

In terms of mobile targets, there are vehicles that use the existing parking lot to the south of the trees to be removed. There are also pedestrians and vehicles that currently use 96 Avenue for recreation and or residential access. There does not appear to be any transit stops on this avenue.

4.0 Proposed Operations – Clearing and Disposal

Subject to the receipt of written approvals by the City of Edmonton, the trees can be cleared using manual felling with chainsaws. No trees on this site need to be climbed. Trees should be directionally felled to the south in the parking lot to a designated tree processing and chipping workspace (see **Appendix 2**). All woody plants within the tree clearing limits are to be cut as close to the ground as practicable. The felled trees, including tops and branches are to be chipped using a larger 10 inch tree chipper.

Wood chips can be stored on site and used for future landscaping purposes or as mulch for the proposed bioswale.

5.0 Scheduling

The tree clearing should be scheduled to avoid any conflict with Migratory Bird Regulations, nesting zones and periods. This parcel of land to be cleared falls into Zone B4 according to the Canadian Regional Nesting period maps Nesting periods - Canada.ca

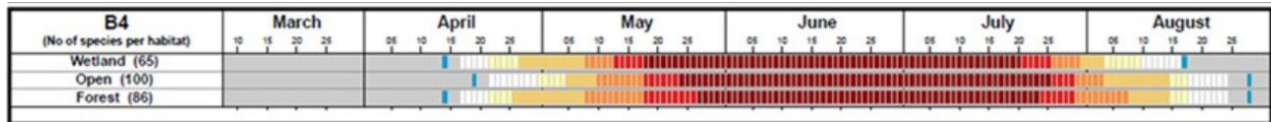


Figure 4. Nesting Calendar for Zone B4.

Vegetation removal should be scheduled outside of the dates above.

6.0 Logistics and Safety Considerations

Once written approvals are obtained, the logistical and safety issues summarized in **Table 1** should be addressed.

Table 1. Logistics and Safety Considerations.

| Item | Description |
|------------------------|---|
| Fencing and Signage | The site to the north, east and west should be fenced off or posted to avoid personal injury to pedestrians along 96 th avenue as well as any recreationalists entering the work site. |
| Public Notification | Recommend that all residential property owners who may be impacted by the tree felling work be notified in writing of tree clearing operations at least 2 – 3 weeks prior to commencement. |
| Staking | Staking of the site to be cleared should be carried prior to felling operations by an Alberta Land Surveyor. It is especially critical to accurately stake out the east boundary to avoid any damage to the remaining natural area. |
| Applicable legislation | Operations should follow all applicable regulations including <ul style="list-style-type: none"> ○ Alberta OH&S Regulations and Safety Code <ul style="list-style-type: none"> ▪ Alberta King's Printer: |

| | |
|--|---|
| | <ul style="list-style-type: none"> ○ AMSI Z133 – 2017 Safety Requirements for Arboricultural Operations <ul style="list-style-type: none"> ▪ International Society of Arboriculture (isa-arbor.com) |
| Epcor Line Clearing | Contact should be made with Epcor for line clearing prior to felling any trees in close proximity to the existing lines; i.e. trees within 7 meters of power lines. VegetationManagement@epcor.com |
| Safety orientation and hazard assessment | Daily safety meetings should take place and recorded to reflect changing weather and site conditions. |
| Traffic Control | May require a On-Street Construction and Maintenance Permit (OSCM) from City for control of traffic along south side of 96 Ave for removal of trees north over 96 avenue https://www.edmonton.ca/sites/default/files/public-files/MTTC_2023.pdf |
| Work Scheduling | Schedule the tree removal work outside of the Edmonton Ski Hill hours of operation: <ul style="list-style-type: none"> Monday 5–9 p.m. Tuesday 5–9 p.m. Wednesday 1–9 p.m. Thursday 1–9 p.m. Friday 1–9 p.m. Saturday 9 a.m.–5 p.m. |

LIMITATIONS

This report has been prepared for the use of GEC Architecture Ltd. relative to the proposed project described in the report. The quality of the information and the conclusions are based on information at the time of preparation of the report. This includes data supplied by third party sources.

The Consultant makes no representation of fact or opinion of any nature whatsoever to any person or entity other than the company, organization or individual to whom this report is addressed. UrbFor Consulting Ltd. denies any liability whatsoever to other parties who may obtain access to this report for any injury, loss or damage suffered by such parties arising from their use of, or reliance upon, this report or any of its contents without the express written consent of the author and the client.

Subject to the following conditions and limitations, the investigation described in this report has been conducted in a manner consistent with a reasonable level of care and skill normally exercised by members of the urban forestry consulting profession currently practicing under similar conditions in the area.

The assessment described in this report has been limited to the scope of work described in discussions between UrbFor Consulting Ltd. and GEC Architecture Ltd. in January 2024.

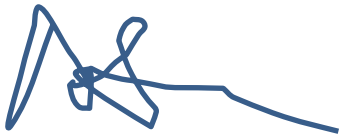
The possibility of contamination from past activities on the property and the impact to tree root systems and future tree health, or other public safety risks, were not included in this assessment.

UrbFor Consulting Ltd. assumes no liability for the trees that may be impacted by construction activity involved with this development. UrbFor Consulting Ltd will not be held responsible for any damage to the trees on site or any replacement costs.

CLOSURE

This report has been prepared and submitted by UrbFor Consulting Ltd as documented above. We trust that the information presented is suitable for your needs. Should you have any questions, please contact the undersigned at (780) 288-8680.

Sincerely,
UrbFor Consulting Ltd.

A handwritten signature in blue ink, appearing to read "Andre Savaria", with a long horizontal line extending to the right.

Andre Savaria RPF #317
ISA Certified Arborist PR-4880A



List of Appendices

Appendix 1 City of Edmonton Plan Requirements

Appendix 2 Site Plan for Vegetation Removal